Narragansett Bay Research Reserve

DATE: March 14, 2023

TO: Council Chair Raymond C. Coia and Members of the Council

Cc: Jeffrey M. Willis, Executive Director

FROM: Caitlin Chaffee, Reserve Manager, Narragansett Bay National Estuarine Research Reserve
Co-Chair, CEHRTF Technical Advisory Committee

Re: Projects Recommended for Funding Under the RI Coastal and Estuarine Habitat Restoration Trust Fund

The RI Coastal and Estuarine Habitat Restoration Team's Technical Advisory Committee (TAC) convened on Thursday, February 23, 2023, to rank and discuss the full proposals submitted to CRMC for consideration of funding under the state's Coastal and Estuary Habitat Restoration Trust Fund. Of the proposals reviewed for the 2022-2023 funding cycle, five are recommended for funding.

The projects recommended for full funding are:

1. Ten Mile River Reservation Dam Removal Assessment ($50,000)
2. Rodman Mill Dam Fish Passage Restoration ($24,000)
3. Restoration of Legacy Agricultural and Mosquito Abatement Impacts to Galilee Salt Marsh ($40,500)
4. Woonasquatucket In-Water and Bank Habitat Improvement Below Manton Dam ($50,000)

The projects recommended for partial funding are:

1. Hunts Mill Fish Passage Restoration ($60,500)

All proposals are evaluated and ranked using standard criteria and an evaluation form developed by the TAC, available on the CRMC website at http://www.crmc.ri.gov/habitatrestoration.html.

Participating Technical Advisory Committee Members:

Tom Ardito, Restore America's Estuaries
Caitlin Chaffee, Narragansett Bay National Estuarine Research Reserve
Philip Edwards, RI DEM Division of Fish and Wildlife
Leah Feldman, RI Coastal Resources Management Council
Mike Gerel, Narragansett Bay Estuary Program
Alan Gettman, RI DEM Mosquito Abatement Coordination Office
Suzanne Paton, US Fish and Wildlife Service
Margherita Pryor, US Environmental Protection Agency
Jim Turek, NOAA NMFS Restoration Center

In this agenda package, you will find:

- A summary showing all proposals, matching fund amounts, and the funding amount recommended by the TAC.
- A map showing the geographic distribution of Habitat Trust Fund funded projects
- Narrative text of all proposals submitted to CRMC for consideration for fiscal year 2023.**

**Additional proposal support materials (photos, engineered plans, letters of support etc.) are available upon request.

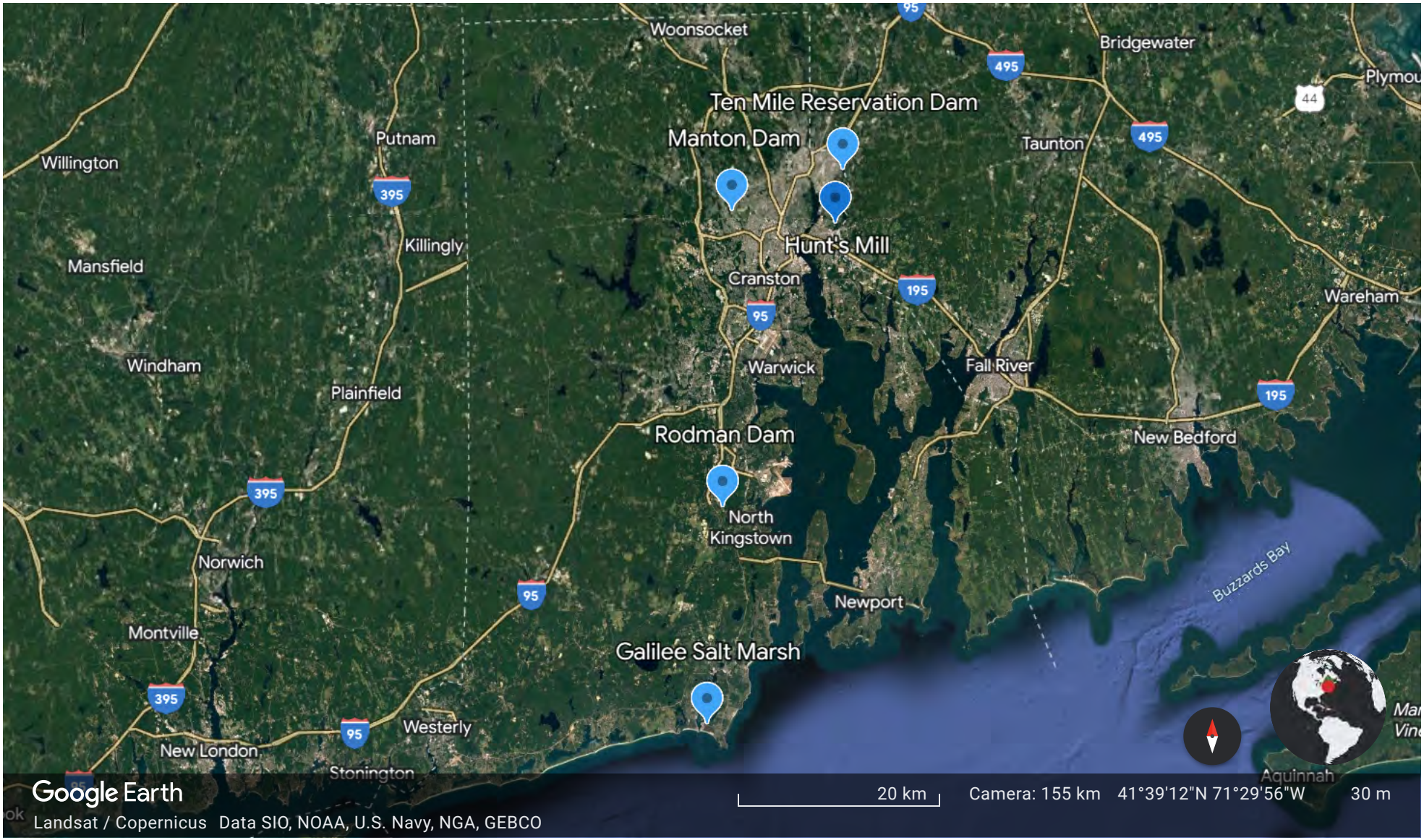
Funding Recommendations for 2021-22 Trust Fund Monies

Projects recommended for funding:

Project Name	City/Town	Award Amount	Match
Hunts Mill Fish Passage Restoration	Wakefield	$60,500	$205,000
Ten Mile River Reservation Dam Removal Assessment	Pawtucket	$50,000	$10,033
Rodman Mill Dam Fish Passage Restoration	North Kingstown	$24,000	$3,447
Restoration of Legacy Agricultural and Mosquito Abatement Impacts to Galilee Salt Marsh	Narragansett	$40,500	$25,535
Woonasquatucket In-Water and Bank Habitat Improvement Below Manton Dam	Johnston	$50,000	$314,340
	TOTAL	**$225,000**	**$558,355**

Habitat Restoration Team Technical Advisory Committee Members:

Member	Affiliation
Tom Ardito	Restore America's Estuaries
Caitlin Chaffee	Narragansett Bay National Estuarine Research Reserve
Phil Edwards	DEM Division of Fish and Wildlife
Leah Feldman	Coastal Resources Management Council
Alan Gettman	DEM Mosquito Abatement Coordination Program
Mike Gerel	Narragansett Bay Estuary Program
Suzanne Paton	US Fish and Wildlife Service
Margherita Pryor	US Environmental Protection Agency
James Turek	NOAA Fisheries Restoration Center


Woonsocket
Bridgewater
Ten Mile Reservation Dam
Manton Dam
Hunt's Mill
Putnam
Willington
Killingly
Mansfield
Taunton
Cranston
Wareham
Windham
Plainfield
Warwick
Fall River
Rodman Dam
New Bedford
North Kingstown
Norwich
Buzzards Bay
Newport
Montville
Galilee Salt Marsh
Westerly
New London
Stonington
Aquinnah
Google Earth
20 km
Camera: 155 km 41°39'12"N 71°29'56"W 30 m
Landsat / Copernicus Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Rhode Island Coastal and Estuary Habitat Restoration Fund
Full Proposal Form 2022/2023

****for planning projects please use Full Proposal Form for Planning Projects**

I. PROJECT SUMMARY

1. **Project Title:** Improving Fish Passage on the Ten Mile River
2. **Project Location and coordinates** *(include map)*: Hunts Mill, East Providence
3. **Project type** *(Design, Construction or Other)*: Design/Construction
4. **If other, please specify:**
5. **Habitat type** *(River System, Salt Marsh, Seagrass, Shellfish Bed, other)*: River System
6. **If other, please specify**:
7. **Restoration technique** *(e.g. re-vegetation, tidal restoration, etc.)***:** Fish Passage
8. **Total acreage or miles(river systems) of habitat to be restored, or project area planning unit size:** Improve diadromous fish access to 300 acres of spawning and rearing habitat.
9. **Project benefits:**
10. **Project partners** *(organizations providing financial or other support to the project)***: TNC,** DEM, City of East Providence
11. **Is this is an ongoing project that has previously received funds from the CRMC Coastal and Estuarine Habitat Restoration Fund?** No **If yes, year(s) funding was awarded:**

II. PROJECT MANAGER CONTACT INFORMATION

1. **Name:** John O'Brien
2. **Organization**: The Nature Conservancy
3. **Address**: 159 Waterman Street
4. **City**: Providence **5. State**: RI **6. Zip**: 02906
7. **Phone**: 401-835-3011 **8. Email**: jobrien@tnc.org
9. **Property Owner(s)**: City of East Providence

Applicant must document ownership of project site or permission to perform all proposed restoration, maintenance and monitoring activities *(include appropriate documentation).*

III. BUDGET SUMMARY

(List individuals or organizations providing financial or in-kind support to the project under Project Partners)

	Amount Requested from Trust Fund	**$75,245**
Matching Funds	**Project Partner(s)**	**Amount of Match**
	The Nature Conservancy (Cash)	$173,670
	The Nature Conservancy (In-kind)	$10,000
	DEM – Fish and Wildlife (In-kind)	$10,000
	TOTAL PROJECT COST	**$268,915**

IV. PROPOSAL NARRATIVE (five pages maximum)

1. Justification and Purpose

Describe the human impacts and previous restoration activities at the proposed project site. If multiple sites, please describe the impacts and previous restoration activities at each). Briefly describe the proposed project, its restoration goals, long-term and short-term outcomes.

This project is located at the Hunts Mill Dam in East Providence, Rhode Island on the Rhode Island/Massachusetts State Line. Hunts Mill Dam is a structure in Ten Mile River, a 22-mile long Seekonk River tributary that flows through Massachusetts and Rhode Island.

In 2015 ACOE & Partners completed three fish passage projects on the Ten Mile River. Fish ladders were constructed at the Omega Pond Dam (2011-2015), Hunts Mill Dam (2010-2012) and Turner Reservoir Dam (2010-2012). River herring now had access to 22 miles of spawning and nursery area which are supporting sustainable populations.

However, following construction of the Hunts Mill Dam fish ladder, it was determined that rock ledge head cut below the entrance to the ladder has made the channel impassible by fish at period of low flow, as well as when water velocity is high, and it is challenging for fish to reach the ladder. Large quantities of fish would backed up below the entrance and were required to be hand-lifted over the obstruction.

To remedy the issue, a temporary proof-of-concept design developed by ACOE and the USFWS Fish Passage Team was implemented at the site in 2020. This consisted of three step pools and four weirs constructed from sand-filled supersacks TNC worked with a contractor and USFWS Fish Passage Engineering Team to construct the temporary weirs. Weir heights, low flow notches, headwater/tail water elevations, and changes in stream velocities were measured by USFWS. Observation of water levels in the step-pools led to conclusions that this was a viable concept for fish conveyance, with some adjustments, including the additional of a fifth weir on the downstream end of the system. The configuration of the weirs and water

flow was determined to be conducive for passage of river herring. This proof-of-concept serves as the basis for the permanent design outlined below.

2. Project Activities, Schedule and Work Plan

Describe the planned on-the-ground project activities, and explain how each activity will help to restore ecosystem functions. List specific project activities and when they will occur (month and year). Indicate when annual and final project reports will be submitted.

Based on the temporary proof of concept conducted in 2020, a final report including design and specifications for permanent weirs was prepared by ACOE. The proposal included a total of five weirs to be constructed in the side channel on river right. Per ACOE design, each weir was to be constructed using rock filled gabions with a capstone surface. These designs and specifications were included in the October pre-proposal submitted to RICEHRTF. Since that time TNC and DEM have reached out to a number of contractors for bid proposals using that ACOE design. Unfortunately no bid proposals were returned. Contractors had serious concerns that the specifications provided by ACOE (e.g., tolerances for elevations of weirs, water surface elevations) could not be achieved utilizing the construction methods proposed by ACOE. . It was pointed out that the rock filled gabion weirs would not have the ability to seat flush with the existing irregular bedrock streambed as well as provide a proper seal within the gabions to hold back water. The desired depth through the low flow notch is a critical design feature associated with each weir in order to successfully pass fish upstream. Contractors were concerned that the intent of the design could not be achieved via the construction methods proposed by ACOE and were not comfortable taking on the associated liability. An ancillary liability concern was the long-term structural integrity of gabion baskets in an in-river application. Contractors voiced concern, that the rock filled gabion weirs would eventually become unstable (likely due to fatigue and corrosion of the wiring that comprise the baskets). Any failure within the system of weirs would cause the water surface elevations to fall outside of the design and would likely hinder upstream passage performance.

To correct this, and as an alternative, the project has made a shift and has proceeded with a design/build approach that will construct cast in place concrete weirs instead of the rock filled gabion weirs. This alternative has been reviewed by the USFWS Fish Passage Engineering Team and they are in support of the concrete weir option. The goals and objectives of the project remain the same. Only the approach has changed. TNC has moved ahead and has executed a contract with SumCo Eco Contracting and construction will be scheduled for late summer of 2023. The contract scope will require the contractor to design and build five cast in place concrete fish weirs that will allow migratory fish to reach the entrance of the Hunt's Mill fish ladder during extreme high and low flows. The contractor will sub-contract the engineering firm of Fuss & O'Neill who will design reinforced concrete weirs that will be pinned to the existing bedrock on the river. TNC, USFWS, and the contractor and sub-contractor feel this design will offer the most robust option for fish passage and will last for many years to come.

The following is an outline of the schedule and the workplan approach for the design/bid contract with SumCo Eco Contracting and Fuss & O'Neill.

1)Contractor/TNC to confirm all elevations depicted on Army Corps of Engineers' ACOE) drawings remain valid for purposes of this design.
Convert existing ACOE drawings from PDF to AutoCAD format; prepare drawings for structural design revisions by Fuss & O'Neill.

Complete structural design analysis and prepare drawings depicting weir and ledge spine sections and profiles as cast-in-place concrete structures pinned to exposed bedrock.

Prepare technical specifications for cast-in-place concrete and anchorages to bedrock.

Transmit draft drawings and specifications to the contractor for review.

Finalize/PE-stamp drawings and transmit to the contractor for construction.

Deliverable: Draft and final drawings and specifications (PDF format)

2) The sub-contractor Fuss & O'Neill will provide Construction Phase Assistance.

Review and return submittals prepared by the contractor for technical specifications prepared by Fuss & O'Neill.

Conduct up to three (3) site visits to observe construction activities. These are anticipated to allow observation of prepared bedrock, placement of anchorages and steel reinforcing, and forming/pouring of concrete.

Deliverable: Stamped submittals (PDF format)

3) The contractor will establish water control utilizing a combination of large bulk sandbags and small 50lb sandbags and sealed with 6mil polyethylene liner to seal off the work area. The contractor will construct a temporary access ramp into the river at the downstream location of weir #5 . This ramp will be used for personnel as well as access for a 20,000lb excavator to install water control and ledge removal for the weirs. The excavator will be equipped with a digging bucket and a hydraulic hammer for localized ledge removal. Ledge removal will be conducted to achieve desired pool depth as well as provide an adequate foundation for the concrete formwork to sit on.

4) The contractor will also use rock drills and jackhammers to smooth out the left and right banks to allow formwork to fit as tightly as possible to the bedrock. #5 epoxy coated rebar will be installed at design intervals and will serve to mechanically connect the weirs to the bedrock.

5) The concrete weirs will be approx. 2' wide and will follow the alignment as supplied in the bid documents. Top of weirs and notches will have a trowel finish and will follow the grades as supplied in the bid documents.

6) The contractor will use a similar detail for the work required to bring the spine to grade and alignment.

7) The contractor will provide a pre and post construction survey of the existing water department brick building and vibration monitoring for this building will be conducted during ledge removal operations.

8) The contractor will provide a PE stamped as-built for the 5 weirs and spine.

3. Minimization of Adverse Impacts

What are the potential impacts resulting from project activities (e.g. the disturbance of sensitive species by construction activities), and how will these impacts be minimized (e.g. scheduling construction to avoid disturbance of sensitive species).

Construction will be scheduled in the late summer after the spring run of spawning fish.

4. Public Support

Demonstrate public support for the project by providing evidence of communication with adjacent landowners, community members and other stakeholders. Describe planned or completed community / stakeholder education and outreach efforts.

Support: This project, as well as other projects improving fish passage, is strongly supported by both commercial and recreational anglers. Improving fish passage at the Hunts Mill fish ladder is coordinated with, and supported by, the Ten Mile River Watershed Council and the City of East Providence.

Education and Outreach: Both the Nature Conservancy and the Department of Environmental management will carry a link on their web site that outlines the project and the conservation/habitat restoration outcomes. RIDEM/Fish & Wildlife also recruits and manages volunteer observers to enumerate returning fish during the spring run.

5. Economic and Educational Benefits

How will the proposed project provide direct economic and/or educational benefits to a community and/or the state?

Recreational fishing in Rhode Island is an extremely popular and important outdoor recreation activity. Based on the 2011 National Survey, fishing-related expenses in Rhode Island totaled $130 million annually. The annual estimated value of both the recreational and commercial fishery in Rhode Island is over $400,000,000. Stream restoration, improving connectivity, provides a direct benefit to this important recreational and commercial fishing activity both in fresh and salt water. Both adult and juvenile river herring provide an important forage base for freshwater and saltwater game fish such as largemouth bass, chain pickerel, striped bass and bluefish. Increasing the diadromous spawning populations in the Ten Mile River will substantially enrich the main river as well as the lower river estuary the upper and lower bay as well as Rhode Island Sound, and the western North Atlantic.

6. Climate Change and Coastal Resiliency

How have the present and future impacts of climate change been considered during the project planning and design phases? What impact will the project have on resilience of coastal or estuarine habitat to climate change?

Fish ladders provide passage around dams and other obstacles to spawning and nursery grounds for Diadromous fish. Fish ladders are designed to operate over a specific stream flow range. Climate change has caused a significant increase in extreme weather events and has expanded the range of stream flow during the migratory seasons. Modifying or adjusting the design of fish ladders will provide proper water levels and velocities in the ladders to accommodate effective fish passage with current and future fluctuations in stream flow.

7. Environmental Justice

Will the proposed project take place within or otherwise benefit environmental justice "priority areas" as defined by the Narragansett Bay Estuary Program's analysis of Environmental Justice in the Narragansett Bay Region? Does the proposed project incorporate Environmental Justice concerns as defined by the US EPA's Guidance on Environmental Justice and Equitable Development?

The lower Ten Mile river runs through a densely populated and heavily industrial area. It is adjacent to and runs through priority areas designated by the NBEP analysis of environmental Justice in the Narragansett

Bay Region. The restoration of diadromous fish to the Ten Mile will augment and restructure forage species in the river as well as the Providence River Estuary Region. Supporting a recreational fishery for residents in all neighborhoods in the Providence, East Providence, and Pawtucket areas.

8. Planning Consistency and Restoration Priority

Is the proposed project consistent with the goals of a local, state or regional planning initiative? Please specify initiative and explain (see CRMC website for guidance). Does the proposed project involve a state, regional or federal priority habitat restoration need or special consideration? Please specify and explain (see CRMC website for guidance).

Improving fish passage on the Ten Mile River is consistent with the "Rhode Island State Estuary and Coastal Habitat Restoration Strategy", the "Rhode Island State Wildlife Management Plan", and the ASMFC "Interstate Fishery Management Plan for Shad and River Herring".

9. Species of Concern

Will the project result in benefits to wildlife species listed as federally or state endangered, threatened, or species of concern within Rhode Island? Please specify which species will benefit and how. For a list of species, see the Rhode Island National Heritage Program's listing of animals at: http://www.rinhs.org/wp-content/uploads/ri_rare_animals_2006.pdf or *a listing of plants at:* http://www.rinhs.org/wp-content/uploads/ri_rare_plants_2007.pdf

Improvements to this fish ladder will increase upstream passage, spawning and nursery habitat for river herring. The National Marine Fisheries Service has listed river herring (both alewives and blue backs) as "species of concern" and continues to evaluate the status of Atlantic Coast river herring populations. River herring are listed as NOAA trust resources and are federally managed species through the Atlantic States Marine Fisheries commission (ASMFC). Currently there is a moratorium on the taking of river herring in Rhode Island freshwater and marine waters. Alewife, blue back herring and American eel fall under the ASMFC Coast Wide Management Program. There is a coast wide management program for each species. In addition, the 2015 Rhode Island Wildlife Action Plan has listed each of these four species as a "Species of Greatest Conservation Need" (GCN).

10. Permitting

List any federal, state or local permits required to complete the project and the permit application status for each.

Wetland permits from DEM are in progress.

11. Capacity of Lead Organization (attach additional materials if necessary)

Demonstrate the capacity of the lead and/or partner organizations to successfully complete the proposed project by providing any or all of the following: a) a description of the organization(s) b) resume(s) or summary of qualifications of involved personnel c) evidence of successfully completed habitat restoration or conservation projects.

The Nature Conservancy is the largest worldwide conservation organization. The Rhode Island Chapter Field Office is staffed with habitat restoration specialists including administrators, biologists, and a conservation engineer. The Chapter is supported by a regional grant service network that includes grant specialist, fiscal officers, and legal staff. The Conservancy is currently involved in a number of marine and freshwater habitat restoration projects in Rhode Island that are providing important deliverables on time

and on budget. The Chapter has a reputation for being experienced, responsible, and effective, working with grant opportunities that have short time frames. Scott Comings, Associate Director of the RI TNC Chapter will be the TNC Project Manager for the Hunts Mill Fish Ladder project. He will be assisted by John O'Brien, who is now the Partnership Specialist at TNC, and has many prior years of experience at DEM, Division of Fish and Wildlife, where he led the diadromous fish program. They will partner with Phil Edwards and Pat Magee with DEM Division of Fish and Wildlife In addition, the project team will include personnel from, USFWS Fish Passage Engineering Team.

V. SUSTAINABILITY (one page maximum)

1. Maintenance

What is the estimated "lifespan" of each planned restoration activity? What are the anticipated short-term and long-term (beyond the funding period) operation and maintenance requirements of the project? Specify who will be responsible for funding and carrying out each O & M activity. Indicate when and with what frequency activities will occur.

The Department of Environmental Management is the primary agency responsible for managing the natural resources of the state of Rhode Island. The Department's Division of Fish and Wildlife monitors the populations of diadromous fish and maintains and operates the various fishways located on streams throughout the state. Fishways are checked and adjustments are made regularly during the spring run and again in the late summer and fall to assist with the outmigration of juveniles. Currently DFW operates and maintains the Hunts Mill fish ladder and plans to continue to do so.

2. External Factors

Identify existing external (off-site) factors that could reduce the chances of achieving the project goals (e.g. stormwater inputs to the site from the surrounding drainage area). Explain how these external factors will be addressed. Describe any additional measures taken to help ensure long-term success of the project (e.g. installation of stormwater management practices or securing of conservation easements).What are the likely future effects of climate change and future sea level rise on the proposed project and how will these be addressed?

VI. EVALUATING PROJECT SUCCESS (one page maximum)

1. Performance Measures

How will the success of the project be measured in relation to the restoration goals set forth in this proposal? List performance measures and how they will be recorded. Include a detailed monitoring plan; if applicable (see below).

2. Monitoring Plan

Describe any planned or completed pre- and post-project monitoring activities. For each monitoring activity list the frequency and month/year of start and end date and the parameters measured. List the entity or entities responsible for funding and carrying out each monitoring activity, and describe how results will be made available to CRMC and the public. If using an established monitoring protocol, please provide references (see CRMC website for information on established monitoring protocols).

An increase in the abundance of the targeted diadromous species will serve as the metrics for performance of the proposed restoration project. These results will be measured through monitoring of the pre-spawned adult returns conducted by the Rhode Island DEM, Division of Fish and Wildlife at each ladder throughout the spring run. In addition, the Division will also be sampling for juveniles in the late summer and early fall, both in the river and in the Providence River Estuary. The long term goal of the project is to improve fish passage on the Ten Mile River increasing the population of self-sustaining populations of diadromous fish.

VII. PROJECT BUDGET TEMPLATE

BUDGET CATEGORY	CRMC REQUEST	MATCH	MATCH PENDING OR SECURED? (select one)	SOURCE OF MATCH	TOTAL
Design/Construction	$75,245	$173,670	Secured	TNC	$248,915
Project Management		$10,000	Secured	TNC	$10,000
Monitoring		$10,000	Secured	DEM	$10,000
TOTAL				**TOTAL PROJECT COST**	$268,915

VIII. BUDGET NARRATIVE (one page maximum)

Please provide a description and justification for each line item included in the project budget form (e.g. for personnel costs, provide hourly and fringe rates, for travel specify rate and estimated number of miles). Please specify any match requirements for each source of funding. Please include costs associated with required annual and final reports to CRMC. Be sure to detail how CRMC funds will be used.

Design/Construction - Description of Services

To design and build a fish structure to improve fish passage into the entrance of the Hunt's Mill fish ladder on the Ten Mile River, East Providence, Rhode Island. Specifically, the contractor working with sub-contractor engineer Fuss & O'Neill will design reinforced concrete weirs that will be pinned to the existing bedrock on the river. TNC, USFWS, DEM and the contractor and sub-contractor feel this design will offer the most robust option for fish passage and will last for many years to come. Total cost for the executed design/build contract is $248.915. TNC will provide a $173,670 to match the CRMC grant.

Project Management

Funding for project management will be provided by The Nature Conservancy (TNC). TNC staff including the Assistant Stere Director, The Partnership specialist, the TNC Conservation Engineer as well as the USFWS Fish Passage Engineers (under contract with TNC) will provide all of the required services for project management. This will be an in-kind contribution to the project with an estimated value of approximately $10,000.

Monitoring

Funding for monitoring performance, maintenance, and adjustments of the fish ladders will be provided by the DEM Division of Fish and Wildlife. These facilities are incorporated into their diadromous restoration program and as serviced on a routine basis. During both the spring and the fall run periods, the ladders are check frequently to evaluate returns and outmigrants and adjusted as necessary. This will be an in-kind contribution to the project with an estimated value of $10,000.

X. ADDITIONAL MATERIALS

Please include the following with your application:

___ Site and Locus Maps

_X_ Ground-level photographs of existing site conditions

___ Aerial photographs, if available

___ Preliminary design drawings, maps or engineering plans, if available

___ Pertinent physical, ecological, biological, and cultural / historical survey data

___ Letters of support

The Hunts Mill Fish Ladder located at the Hunts Mill Dam

The head cut in the ledge (at high water) located 50’ below the entrance to the ladder.

Surveying the location of the head cut in the ledge below the Hunts Mill Fish Ladder at low water.

AUTHORIZED SIGNATURE

AUTHORIZED AGENT OF LEAD ORGANIZATION

Scott B. Comings

_____ January 5 ,2023

Signature **Date**

Return your completed proposal by 4:00 p.m. on **January 27, 2023** to:

Caitlin Chaffee
NBNERR
RI Dept. of Environmental Management
235 Promenade Street
Providence, RI 02908

caitlin.chaffee@dem.ri.gov

Applicants are required to submit one (1) signed hard copy of the proposal form and one (1) electronic copy in Adobe PDF format. **Please submit electronic copy as a **SINGLE PDF FILE** containing all application materials.**

Contact Caitlin Chaffee at **401-222-4700 xt. 277-4417** with any questions.

CRMC
COASTAL RESOURCES MANAGEMENT COUNCIL

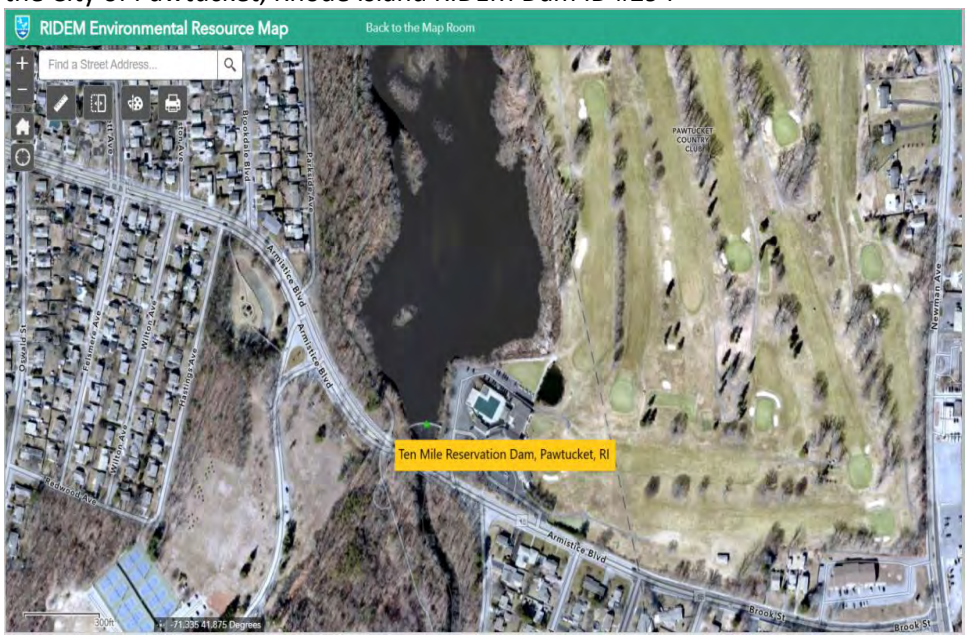
Rhode Island Coastal and Estuary Habitat Restoration Fund
Full Proposal Form 2022/2023

****for planning projects please use Full Proposal Form for Planning Projects**

I. PROJECT SUMMARY

1. **Project Title:** Ten Mile River Reservation Dam Removal Engineering Investigation and Conceptual Design Development

2. **Project Location and coordinates** *(include map)*: Within the Ten Mile River north of Armistice Boulevard in the City of Pawtucket, Rhode Island RIDEM Dam ID #294



3. **Project type** *(Design, Construction or Other)*: Engineering Investigation of Dam Removal

4. **If other, please specify:** NA

5. **Habitat type** *(River System, Salt Marsh, Seagrass, Shellfish Bed, other)*: River System

6. **If other, please specify**: NA

7. **Restoration technique** *(e.g. revegetation, tidal restoration, etc.)***:** Dam Removal

8. **Total acreage or miles(river systems) of habitat to be restored, or project area planning unit size:** Approximately 21 acres of open-water impoundment restored to vegetated riparian habitat and restored river connectivity of approximately 2.5 river miles on the Ten Mile River and 3.3 river miles on the Seven Mile River

9. **Project benefits:** Increased river connectivity for aquatic organisms, including river herring, increased water quality by removing impoundment, and revegetation of forested wetland and shrub swamp along the riverbanks.

10. **Project partners** *(organizations providing financial or other support to the project)***:** Ten Mile River Watershed Council, Rhode Island Department of Environmental Management, Save The Bay, and Fuss & O'Neill

11. **Is this is an ongoing project that has previously received funds from the CRMC Coastal and Estuarine Habitat Restoration Fund?** Yes **If yes, year(s) funding was awarded:** 2021 $5,000 (pending) and 2022 $50,000

II. PROJECT MANAGER CONTACT INFORMATION

1. **Name:** Keith Gonsalves, President
2. **Organization:** Ten Mile River Watershed Council
3. **Address: PO** Box 16611, 10 Newman Avenue
4. **City:** Rumford **5. State:** RI **6. Zip:** 02916
7. **Phone:** 401-474-3813 **8. Email:** keith@tenmileriver.net
9. **Property Owner(s):** RI Department of Environmental Management

Applicant must document ownership of project site or permission to perform all proposed restoration, maintenance and monitoring activities *(include appropriate documentation).*
See attached letter from Phil Edwards from RIDEM's Division of Fish and Wildlife.

III. BUDGET SUMMARY

(List individuals or organizations providing financial or in-kind support to the project under Project Partners)

	Amount Requested from Trust Fund	**$50,000**
Matching Funds	**Project Partner(s)**	**Amount of Match**
In-kind project management time	Ten Mile River Watershed Council (50 hours)	$1,498
In-kind Staff time	RIDEM/Fish & Wildlife Staff (35 hours)	$1,700
In-kind Staff time	Save The Bay Director of Restoration Save The Bay Narragansett Bay RiverKeeper	$6,835
	TOTAL PROJECT COST	**$60,033**

IV. PROPOSAL NARRATIVE (five pages maximum)

1. Justification and Purpose

The Ten Mile River Watershed Council, in coordination with RIDEM and Save The Bay, proposes to conduct preliminary engineering assessments of the removal of the Ten Mile River Reservation Dam to restore fish passage and restore a free-flowing river channel.

The project partners are assessing dam removal as the preferred restoration alternative for river restoration and fish passage. Dam removal is the preferred alternative since it would remove a barrier to fish and aquatic organism passage and allow upstream migration for anadromous fish. The dam removal will also restore the floodplain habitat, replacing the current warm water impoundment with a free-flowing river and improving the water quality and habitat conditions in the river.

The 2021 RIDEM dam safety report lists the state-owned dam as a low-hazard dam. The 10-foot high and 175-foot long dam was built in 1926 and obstructs anadromous fish passage to upstream spawning habitats in the Ten Mile and Seven Mile Rivers (Figure 1 and 2). The dam creates a shallow 21-acre impoundment that extends approximately 0.5 miles upstream to Sunset Drive in Seekonk. The impoundment suffers from significant algal blooms during the summer and is host to non-native aquatic plants, including an extensive amount of water chestnut (Figure 3). The impoundment is on RIDEM's 303(d) list as impaired for Total Phosphorus and Fecal Coliform. The 2014 Ten Mile River TMDL shows the entire Ten Mile River does not meet state water quality standards for total phosphorus, dissolved oxygen, pathogens, and the following metals: aluminum, cadmium, lead, and iron.

The Ten Mile River has been the focus of a large anadromous fish restoration project which included the construction of fish ladders at the first three dams on the Ten Mile River: the Omega Pond dam, the Hunts Mill dam, and the Turner Reservoir dam. Restoring anadromous fish passage to the lower Ten Mile River has provided anadromous fish access to spawning habitat, including the Turner Reservoir and the 3.2 miles of river between the Turner Reservoir and the Ten Mile River Reservation Dam (Figure 4) While RIDEM Fish & Wildlife observations show that river herring can reach the base of the Ten Mile River Reservation Dam, removal of the dam would increase the length of accessible river miles to anadromous fish for spawning, including approximately 2.5 river miles in the Ten Mile River to the next major dam at Pond Street in Seekonk and 3.3 river miles in the Seven Mile River in Massachusetts.

This project's short-term goal is to continue assessing river restoration options at the Ten Mile River Reservation Dam. The long-term goals for this project are to:

- Restore aquatic connectivity by restoring a free-flowing river,
- Provide upstream fish passage to the Ten Mile River and the Seven Mile River in Massachusetts,
- Improve flood resiliency by reducing upstream flood elevations and downstream flood impacts should the dam fail, and
- Improve the water and habitat quality in the stretch of river that is currently an impoundment and reduce the extent of aquatic invasive vegetation

2. Project Activities, Schedule and Work Plan

Project Activities to Date:

The Watershed Council retained Fuss and O'Neill to conduct the reconnaissance study with funding from CRMC's CEHRTF in 2021. The report included a structural evaluation of the dam, sediment probes to depth to refusal to estimate the nature of sediment and sediment volume, and a description of restoration alternatives. The sediment assessment in the impoundment characterized the average depths of the loose and firm sediments (2.4' and 1.4', respectively). In the impoundment's narrower sections, the sediment's character transitioned from muck to silt, then to sand, and ultimately to gravel at the upper reaches of the impoundment. The refusal appeared to be more

sandy/gravelly substrate in the deeper portions of the pond, likely reflecting the character of the original channel thalweg. The report also included an initial assessment of the potential impact of the dam removal on the Pawtucket Country Club's irrigation pump located in the impoundment. The project partners met with consultants from the Pawtucket Country Club to share the proposed restoration plan and to learn about water use to further assess the impacts of dam removal on the irrigation pump in 2021. The Pawtucket Country Club has an annual lease from RIDEM, which allows the use of the RIDEM lands along the east side of the impoundment, including part of their parking area and the use of the irrigation pump.

In 2022 with additional funding from CRMC's CEHRTF, Fuss and O'Neill conducted the hydrologic and hydraulic assessment, chemical sediment characterization, and additional assessment of the irrigation water withdrawal. A draft report on the results of these assessments was shared with project partners in January 2023. The report includes the results of the chemical sediment characterization, sediment management options, channel configuration post-dam removal, and potential upstream impediments to fish passage, including the former Lebanon Mills Dam and the effects of the dam removal on the golf course irrigation system.

The preliminary assessment of the environmental quality of sediment in the project zone included composite sediment samples along five transects, three in the impoundment, one upstream of Central Avenue, and one downstream of Armistice Boulevard (Figure 5). The results found sediment exceedances of residential direct exposure criteria for priority pollutant metals and PAHs and exceedances of arsenic and beryllium (two metals commonly found in elevated background concentrations) of industrial/commercial direct exposure criteria. No volatile organic compounds or polychlorinated biphenyls were reported above the regulatory criteria. Initial sediment management recommendations have been identified and will be reviewed in a pre-permitting meeting with RIDEM.

Pre and post-dam removal hydraulic modeling was conducted to better assess hydraulic impacts on the river as a result of dam removal. Additional sediment depth and channel bottom topography were collected at 18 cross-sections from just upstream of the dam to the upstream road crossing at Central Avenue in Pawtucket. The modeling showed no adverse impact on upstream and downstream bridge structures. The remnants of the Lebanon Mills Dam just downstream of the Central Avenue bridge ensure that there will be no substantial hydraulic changes to Central Avenue since it slightly impounds water during lower flow conditions.

The sediment mobility and scour assessment found that the river channel bottom downstream of the dam and upstream near the Central Avenue Bridge crossing primarily comprised of cobbles and sand/gravel with minimal loose sediment (less than 3 inches on average). As a result, it does not appear that sediment mobility will be a concern at these locations. However, the general subsurface conditions of the river channel between the dam to a point approximately 2,200 feet upstream of the dam were determined to include a layer of a brown to dark brown silty sand and/or a brown poorly graded sand with silt having an average unconsolidated thickness of approximately 2.8-2.9 feet. The HEC-RAS results found that sediment within the impoundment has the potential to become mobile during all analyzed flood events following dam removal, including the bankfull flow (or 1.5-year flood), and will require sediment management to prevent downstream movement of these sediments due to the levels of contamination detected.

The water withdrawal assessment included an analysis of the pumping data received from the Pawtucket Country Club. Fuss and O'Neill assessed the irrigation system's water withdrawal compared to low flow (7 Q 10) conditions for the river and RIDEM's Stream Water Withdrawal Guidance and evaluated impacts during low-flow or base flow conditions.

Since the Ten Mile River Watershed Council did not receive the 2021 CEHRTF funds due to an administrative issue, the Reconnaissance Study ($5,000) and the sediment characterization and H and H modeling ($45,000) were funded by the 2022 CEHRTF grant. Once the funds from the 2021 CEHRTF are received, those funds will support the finalization of the technical memo with input from the project partners. These funds will also support Fuss and O'Neill's staff time to consult with RIDEM regarding the field data gathered. This includes sediment sampling results,

additional sediment characterization required to develop a sediment management plan, potential sediment management techniques, and potential in river modifications for fish passage enhancement at low flow conditions for the permitting stage of the project. Additionally, it will support consultation with RIDEM on allowable water withdrawal rates as a percentage of riverine low flow requirements for the Pawtucket Country Club's irrigation water withdrawal before beginning the next phase of an engineering assessment of the water withdrawal system.

Proposed Activities:
If funding is secured from this proposal to the CEHRTF, the next phase of the project is to conduct a preliminary engineering investigation to advance the design of dam removal and associated river restoration measures. In coordination with RIDEM and Save The Bay, the Ten Mile River Watershed Council will develop a scope of work with Fuss and O'Neill to conduct a preliminary engineering investigation.

The preliminary engineering investigation will include

- Limited field survey and geometry data gathering of the channel grade controls at the former Lebanon Mill Dam and the downstream bifurcating river channel;
- Base mapping development from available information sources such as LiDAR and limited field surveys;
- Further coordination with the Pawtucket Country Club to confirm peak usage and to obtain actual intake, turbine pump(s), sand media filter system, and associated piping elevations and pump manufacturer/head requirements from its facility department/professional engineer such that additional engineering analyses of the existing golf course irrigation water pumping infrastructure can be performed to better understand how the overall system will be impacted in relation to the future condition of lowered water level and regulatory withdrawal restrictions of the restored river, and what improvements would be required to restore the system to its current capacity;
- Refined conceptual design of dam removal and river restoration to reflect results of consultations with RIDEM about sediment management and irrigation water withdrawal, consultations with the Pawtucket Country Club pertaining to more detailed irrigation supply system information, and the limited field survey investigation of the river channel in the vicinity of the former Lebanon Mills Dam and bifurcated channel;
- Conceptual design of irrigation supply, which could include modified pumping infrastructure and/or possible well installations, and, if appropriate, identification of potential conservation measures that might be applicable to reduce irrigation water demand;
- Identification of access areas required for construction staging, sediment management, dam removal, and in-river improvements, including bank stabilization and revegetation of newly exposed bank & floodplain areas, and scour mitigation; and
- Preparation of draft summary technical memorandum/report and refined draft conceptual design, meeting with project partners to review draft memorandum/report and design plan, and preparation of final memorandum/report and design plan for irrigation system and dam removal.

Save The Bay's Narragansett Bay RiverKeeper, Kate McPherson, a professional wetland scientist, will conduct wildlife surveys in and around the impoundment and complete a detailed map of existing wetland types using available aerial imagery. Kate and Wenley Ferguson, Director of Restoration, will assess the extent of aquatic invasives in the impoundment with guidance from RIDEM staff.

Timeline:

Spring 2023:	Develop scope of work for consultant.
Summer – Fall 2023:	Consultant hired and begins engineering investigations and base mapping, and other tasks outlined above.
Winter 2024:	Share findings of engineering investigations with project partners.
Spring 2024:	Project partners share results of the report with CRMC, MA Division of Marine Fisheries, the City of Pawtucket, the Town of Seekonk, and the Pawtucket Country Club. Host meeting with project stakeholders from RI and MA. Spring 2024: Finalize technical report with input from project partners and stakeholders and submit a final report to CEHRTF.

3. Minimization of Adverse Impacts

Removing the dam would eliminate the warm water impoundment, which is inundated with aquatic invasives species. The impoundment would be restored to the previous wetland condition including a river corridor habitat, a river channel, and a naturally vegetated floodplain complex abutting forested uplands to the west and the current parking area, golf course, and residential land use to the east.

Dam removal construction activity is not part of this grant application, but when it occurs, permitting agencies may restrict in-river construction to the low-flow season (July 1st to October 31st) due to typical RIDEM permitting conditions of approval. The time of year restriction ensures that construction within the River will occur when flows are generally at their lowest. In this case, a portion of the Pawtucket Country Club parking area would still need to be used for construction access and potentially storage during this period. Fuss & O'Neill outlined a potential construction sequencing scenario to minimize adverse impacts from the dam removal that addressed dewatering, sediment management, potential green infrastructure to address stormwater outfalls from Sunset Drive in Seekonk, and site stabilization measures.

4. Public Support

The project team has discussed the restoration project with the City of Pawtucket, the Town of Seekonk, and the Pawtucket Country Club. The technical memo outlining the results of the sediment testing and hydraulic and hydrologic modeling will be shared with these stakeholders and also with the Massachusetts Division of Marine Fisheries, the Massachusetts Division of Ecological Restoration, and the Southeastern Regional Planning and Economic Development District (SRPEDD).

Once initial meetings with RIDEM permitting staff occur to review sediment results to determine potential sediment management strategies and to review the water withdrawal for the irrigation system, the partners will have a clearer understanding of the feasibility of dam removal and can actively engage the community in the restoration planning process. The Ten Mile River Watershed Council will host a public meeting in coordination with the City of Pawtucket and the Town of Seekonk to receive community input on the restoration planning process.

The Ten Mile River Watershed Council will work with project partners, including RIDEM and Save The Bay, to share the results of the assessments through the respective organization's publications and social media.

5. Economic and Educational Benefits

Removal of this dam will reduce the long-term inspection and maintenance costs of the dam for the State of Rhode Island. Future management costs of the invasive water chestnut will be minimized by restoring a free-flowing river.

This project will highlight specific adaptation strategies that can be implemented to restore riverine habitats and adapt to changing conditions due to climate change. Since the western side of the impoundment is publicly accessible via the Ten Mile Bike Path, there will be opportunities to install interpretive signage about the benefits of riverine restoration for water quality, increased river connectivity for anadromous and riverine species, and improved habitat conditions for spawning in multiple languages. As an educational tool, the dam removal will show habitat restoration in action. Fishing for riverine species will likely improve, and public access to the river will continue to be provided along the river's eastern bank owned by RIDEM.

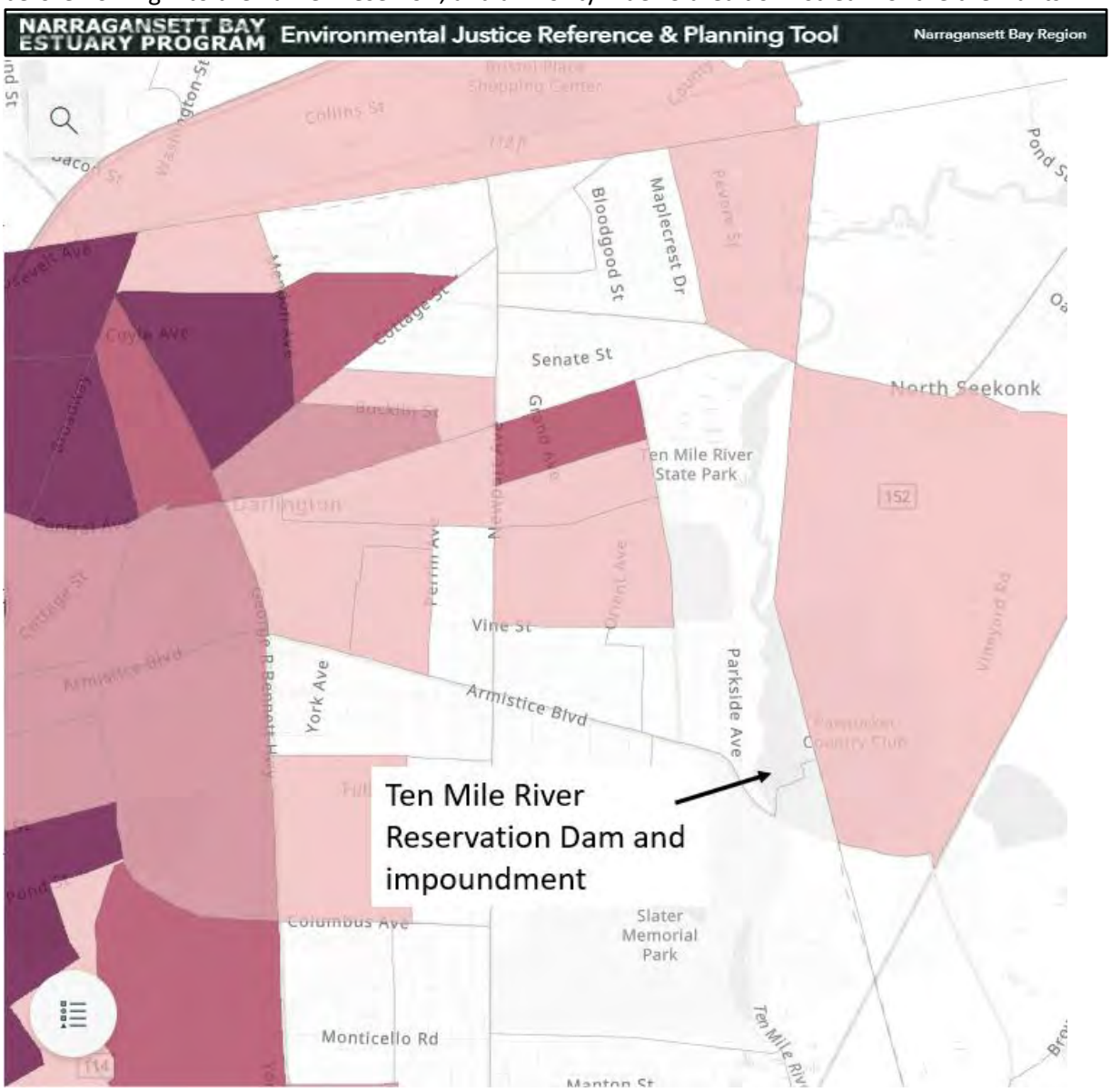
6. Climate Change and Coastal Resiliency

Removing this dam will improve the site's resiliency by recreating a natural river corridor from a formerly impounded area. Through dam removal, the water temperature will be lowered and will provide a more resilient riverine habitat to warming temperatures. Restoration of a free-flowing river will restore freshwater wetlands and improve the water quality of this impaired water body by increasing the dissolved oxygen level and reducing conditions that allow

phosphorus loading from the sediment. As the climate warms and floods become more frequent and intense, removing this dam will also remove a failure hazard.

7. Environmental Justice

The dam and its impoundment are adjacent to Environmental Justice Priority Areas. The neighborhoods adjacent to the Ten Mile River State Park on the west side of Pawtucket's impoundment are Environmental Justice Priority Area Index 3 (25% non-White or Latinx and 49 % low income) and Index 1 (5% non-White or Latinx and 26% low-income). The eastern side of the impoundment in Seekonk is in an Environmental Justice Priority Area Index 1 (14% non-White or Latinx 19 % low-income). The Ten Mile River flows through a second Priority Index 1 area downstream of the dam before flowing into the Turner Reservoir, and a Priority Index 3 area downstream of the the Hunts Mill Dam.



At this stage in the project, the Ten Mile River Watershed Council, RIDEM Division of Fish and Wildlife, and Save The Bay will identify ways to involve community stakeholders that may have been left out of the planning process in the past so that their ideas and concerns can be incorporated into any proposed river restoration and public access enhancement.

8. Planning Consistency and Restoration Priority

At the state level, the project meets the goal of the State of RI's Resilient Rhody Report, the Rhode Island Wildlife Action Plan, and RIDEM's Strategic Plan for the Restoration of Anadromous Fish. This restoration and resiliency project will meet state goals outlined in the *Resilient Rhody* report developed by the Governor's office and an interagency team by removing the dam and enhancing the resilience of the Ten Mile River. In RIDEM's *Rhode Island Wildlife Action Plan*, dams, as modifications to natural systems, are highlighted as threats to wildlife and climate change. Increased temperature and precipitation intensity can exacerbate the effects of these existing threats. This river system is listed in the RIDEM Strategic Plan for the Restoration of Anadromous Fishes to Rhode Island Coastal Streams, prepared in 2002, as a "standout for anadromous restoration." This project will support the goals of river restoration and fish passage within the Ten Mile River watershed by increasing the spawning habitat for anadromous fish by removing impediments to fish passage.

9. Species of Concern

The National Marine Fisheries Service (NMFS) lists alewives and blueback herring as species of concern. Currently, there is a moratorium on taking river herring and American shad in Rhode Island's fresh and marine waters, whose populations had not recovered since the early 2000s when the recreational fishery was closed to harvest. American eel are not listed, but they are an ASMFC-managed species. This restoration project may increase the spawning habitat for diadromous fish species, including alewife (*Alosa aestivalis)* and American eel *(Anguilla rostrata*), by converting an impounded area into a free-flowing river reach. Additionally, it will improve stream continuity to enhance the habitat for some resident species. The following species, in addition to alewife and eel, have been collected by RIDEM in the Ten Mile River and its impoundments: black crappie, bluegill, brown bullhead, gizzard shad, golden shiner, goldfish, largemouth bass, pumpkinseed, redfin pickerel, tessellated darter, white catfish, white perch, white sucker, yellow bullhead, and yellow perch.

Massachusetts Endangered Species Act (MESA) Project Review – The project is not located within Estimated Habitats of Rare Wildlife or Priority Habitat of Rare Species; however, project partners will invite Mass Wildlife to consult on the project. In Rhode Island, the upstream portion of the river is not within any mapped Natural Heritage Area; however, the downstream section of the river is within mapped Natural Heritage Areas for Marsh Wren and Zigzag Bladderwort.

Permitting

This stage of the project proposal does not require permitting. However, a larger dam removal restoration project may require coordination between the regulatory programs in both Massachusetts and Rhode Island since a small portion of the impoundment appears to be located in Massachusetts. If determined that permits are required in Massachusetts for lowering the water level in that area, coordination in the project's planning stages will be necessary to communicate with regulators from MA and RI and facilitate the participation of all parties to determine how to execute the permit application process most efficiently.

State: RIDEM Wetlands Application to Alter Freshwater Wetlands
Federal: Army Corps of Engineers General Permit
State: Review by the Rhode Island Historical Preservation & Heritage Commission

It is not clear at this time which, if any, of these permits would be required since the dam is located entirely within the state of Rhode Island, and only a portion of the impoundment is in Massachusetts. For this reconnaissance study, we assume that all the permits typically required for dam removal in Massachusetts could be required for this project, including local review by the Seekonk Conservation Commission. We have included both staff from the MA Division of Ecological Restoration and the Division of Marine Fisheries in the planning phase of this project. In this next phase of preliminary engineering, we will coordinate with our state agency partners in Massachusetts and the Town of Seekonk to determine any permitting that would be required to remove this dam.

10. Capacity of Lead Organization (attach additional materials if necessary)

The Ten Mile River Watershed Council is a designated watershed council by the Rhode Island Rivers Council. Keith Gonsalves is the President of the Council. The Ten Mile River Watershed Council was established in 2001 and has conducted annual fish counts for the last six years. Most recently, the Ten Mile River Watershed Council led an effort in 2021 to hand pull water chestnuts in the Turner Reservoir in coordination with RIDEM.

Save The Bay is partnering with the Ten Mile River Watershed Council on this project, including grant writing and project coordination. Save The Bay has a long track record of successful restoration projects funded through the Trust Fund. We have been project proponents as well as supporting partners. We have been partners on dam removal and fish passage projects on the Pawcatuck, Pawtuxet, Ten Mile, Kickemuit, and Blackstone Rivers. We have also completed salt marsh restoration and riparian restoration projects throughout the watershed. Kate McPherson, Save The Bay's RiverKeeper is a Professional Wetland Scientist and has expertise in wetlands permitting. She has overseen the dam removal, adaptive management, and monitoring at Shady Lea Dam. Wenley Ferguson, Save The Bay's Director of Restoration, has been involved in all phases of fish passage and dam removal projects, including securing funds for engineering, permitting, construction, and stakeholder engagement. Additional funding sources will be assessed, including SNEP, NOAA Restoration Center, Ocean State Climate Adaptation and Resiliency Fund, and DEM's 319 program.

V. SUSTAINABILITY (one page maximum)

1. Maintenance

What is the estimated "lifespan" of each planned restoration activity? What are the anticipated short-term and long-term (beyond the funding period) operation and maintenance requirements of the project? Specify who will be responsible for funding and carrying out each O & M activity. Indicate when and with what frequency activities will occur.

This phase of the project does not have maintenance associated with it. An ultimate dam removal restoration would be designed to provide fish passage into the future with little maintenance required. The sediment management plan is still being evaluated and will be determined in consultation with RIDEM. Revegetation of the exposed flood plain could require adaptive management and will be incorporated into the final design.

2. External Factors

This site is somewhat impacted by stormwater runoff. For the potential future design of dam removal, Fuss & O'Neill has recommended a conceptual design of stormwater management green infrastructure at each stormwater outfall into the pond, including the Country Club parking lot and Sunrise Drive from Seekonk. The typical contaminants in stormwater runoff from developed areas and roadways are expected to be present in the river. Numerous stormwater pipes are discharging to the Pond from other adjacent land uses. We are unaware of any buried infrastructure along the edge of the Pond/River or beneath the Pond/River. The City of Pawtucket and the Town of Seekonk, in addition to the Pawtucket Water Board, indicated no knowledge of buried utility infrastructure in this area.

Upstream of the Ten Mile River Reservation Dam is the remnant of the former Lebanon Mills Dam, which creates two small hydraulic drops in the river. During minimum design flows, the minimum depth for effective fish passage at Lebanon Mills Dam will not be met, yet the passage will be met under normal design flows. Further evaluation of these conditions will be undertaken.

VI. EVALUATING PROJECT SUCCESS (one page maximum)

1. Performance Measures

This stage of the project will be evaluated as a success when all additional modeling and sampling have been conducted, and a final report has been prepared. It is the project team's experience that it is often easier to find funding sources for construction projects. We will seek diverse funding sources for engineering, permitting, and construction in the future.

2. Monitoring Plan

Since this project is still in initial development, a monitoring plan of the impoundment area is not required at this time. However, in other dam removal projects, monitoring has been implemented for factors including wildlife use, non-native invasive species, sediment accumulation that may block aquatic organisms, and fish migration, and if appropriate, can be implemented for this project.

The Ten Mile River Watershed Council will conduct presence/absence monitoring of river herring at the base of the Ten Mile Reservation Dam during the spring herring run and will share the data with project partners.

VII. PROJECT BUDGET TEMPLATE

BUDGET CATEGORY	CRMC REQUEST	MATCH	MATCH PENDING OR SECURED? (select one)	SOURCE OF MATCH	TOTAL
Fuss and O'Neill Preliminary Engineering Investigation	$50,000	$0			$50,000
President - Ten Mile River Watershed Council	$0	$1,498	Secured	Ten Mile River Watershed Council	$1,498
Staff - RIDEM/Fish & Wildlife Staff Technical Support	$0	$1,700	Secured	RIDEM	$1,700
Staff - Save The Bay Director of Habitat Restoration & Narragansett Bay RiverKeeper plus 10% overhead	$0	$6,835	Secured	Narragansett Bay Estuary Program Capacity Building Grant	$6,835
TOTAL	**$50,000**	**$10,033**		**TOTAL PROJECT COST**	**$60,333**

VIII. BUDGET NARRATIVE (one page maximum)

Line 1: The Ten Mile River Watershed Council will retain Fuss and O'Neill to conduct the Ten Mile River Phase III Preliminary Engineering Investigation, **including the following tasks:**

- Limited field survey and geometry data gathering of the channel grade controls at the former Lebanon Mill Dam and the downstream bifurcating river channel ($5,950)
- base mapping development from available information sources such as LiDAR and limited field survey ($1,140)
- Further coordination with the Pawtucket Country Club to confirm peak usage and to obtain actual intake, turbine pump(s), sand media filter system, and associated piping elevations and pump manufacturer/head requirements from its facility department/professional engineer such that additional engineering analyses of the existing golf course irrigation water pumping infrastructure can be performed to better understand how the overall system will be impacted in relation to future condition of lowered water level and regulatory withdrawal restrictions of the restored river, and what improvements would be required to restore the system to its current capacity ($8,860);
- Refined conceptual design of dam removal and river restoration to reflect results of consultations with RIDEM pertaining to sediment management and irrigation water withdrawal, Pawtucket Country Club and the limited field survey investigation of the river channel in the vicinity of the former Lebanon Mills Dam and bifurcated channel ($5,150);
- Conceptual design of irrigation supply, which could include modified pumping infrastructure and/or possible well installations, and, if appropriate, identification of potential conservation measures that might be applicable to reduce irrigation water demand $15,100;
- Identification of access areas required for construction staging, sediment management, dam removal, and in-river improvements, including bank stabilization and revegetation of newly exposed bank & floodplain areas,

and scour mitigation ($2,100); and

- Preparation of draft summary technical memorandum/report and refined draft conceptual design, meeting with project partners to review draft memorandum/report and design plan, and preparation of final memorandum/report and design plan for irrigation system and dam removal ($11,700).

Line 2: Keith Gonsalves, the president of the Ten Mile River Watershed Council, will dedicate 50 hours at the federal volunteer rate of $29.95/hour for the project management of the grant, participation in the project partner meetings, monitoring of river herring downstream of the dam, and stakeholder and public outreach.

Line 3: Phil Edwards, Chief of the Division of Fish and Wildlife, will dedicate 15 hours at $60/hour to participate in project partner meetings, coordinate meetings with other RIDEM staff, and review technical reports. Patrick McGee, Principal Biologist of Freshwater and Diadromous Fisheries at the Division of Fish and Wildlife, will dedicate 20 hours at $40/hour to project partner meetings, field assessments, and technical report reviews.

Line 4: Kate McPherson, Save The Bay's Narragansett Bay RiverKeeper, will dedicate 70 hours at $44.25/hour, including benefits to conduct aerial wetlands assessment and aquatic vegetation mapping, project partner meetings, and stakeholder engagement with the Town of Seekonk. Wenley Ferguson, Director of Restoration, will dedicate 60 hours at $51.94/hour, including benefits on project coordination, report review, stakeholder engagement, and identification of future funds for engineering and permitting. Wenley will also assist with invasive aquatic vegetation mapping. Save The Bay's staff time, and 10% overhead will be used as match for this project. Save The Bay received a federal grant from the Narragansett Bay Estuary Program to work on capacity building for restoration projects, and these funds will be used to support Save The Bay's staff time.

IX. ADDITIONAL MATERIALS

Please include the following with your application:

__X__ Site and Locus Maps

_X_ Ground-level photographs of existing site conditions

_X_ Aerial photographs, if available

_x_ Preliminary design drawings, maps or engineering plans, if available

__ Pertinent physical, ecological, biological, and cultural / historical survey data

_X_ Letters of support

Figure 1: Ten Mile River Reservation Dam from Armistice Boulevard.

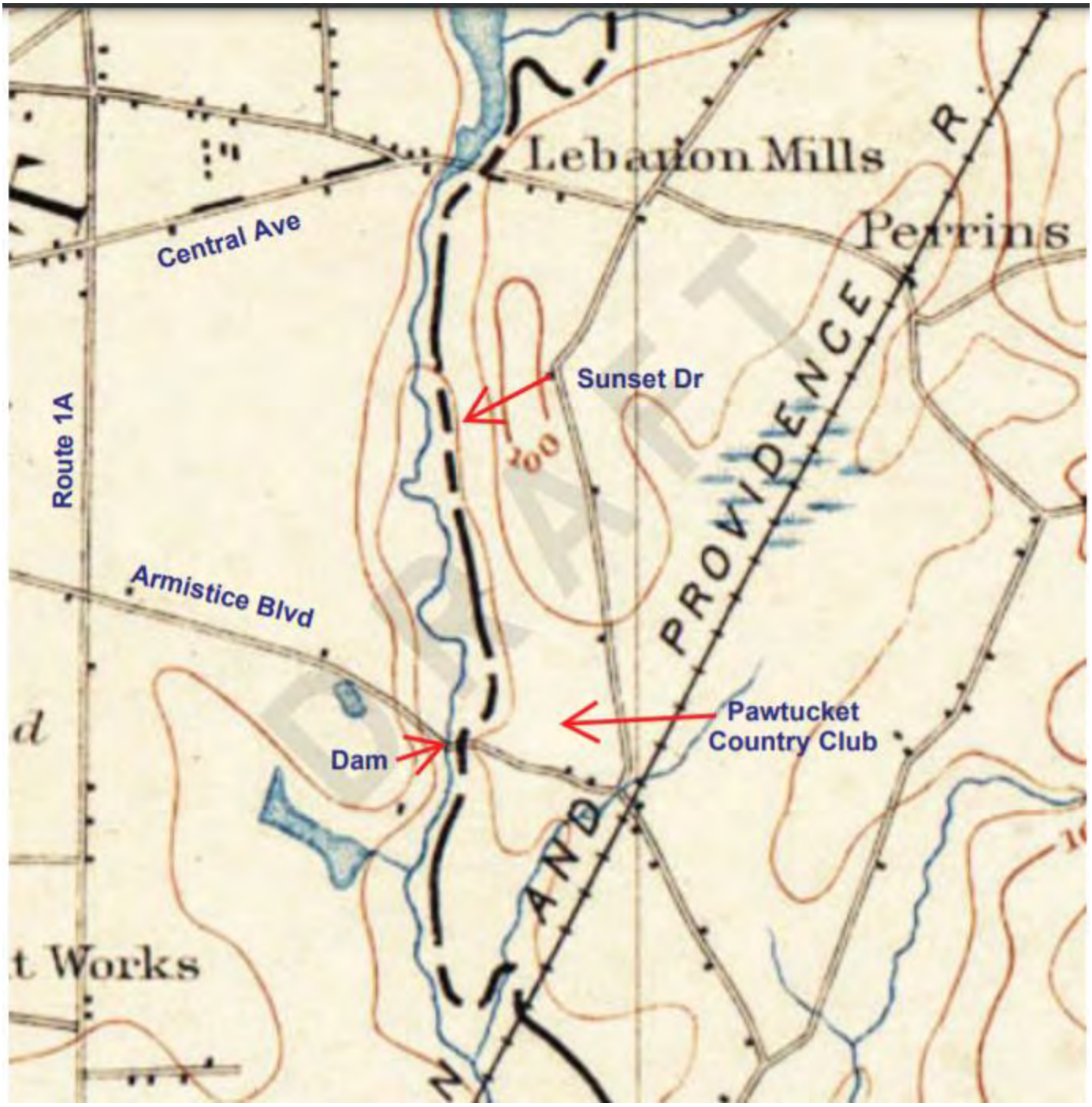


Figure 2: 1887 map of the Ten Mile River corridor upstream of Armistice Boulevard where the impoundment is now located.

Figure 3: Aerial imagery of extent of aquatic vegetation including invasive water chestnut in Fall 2020.

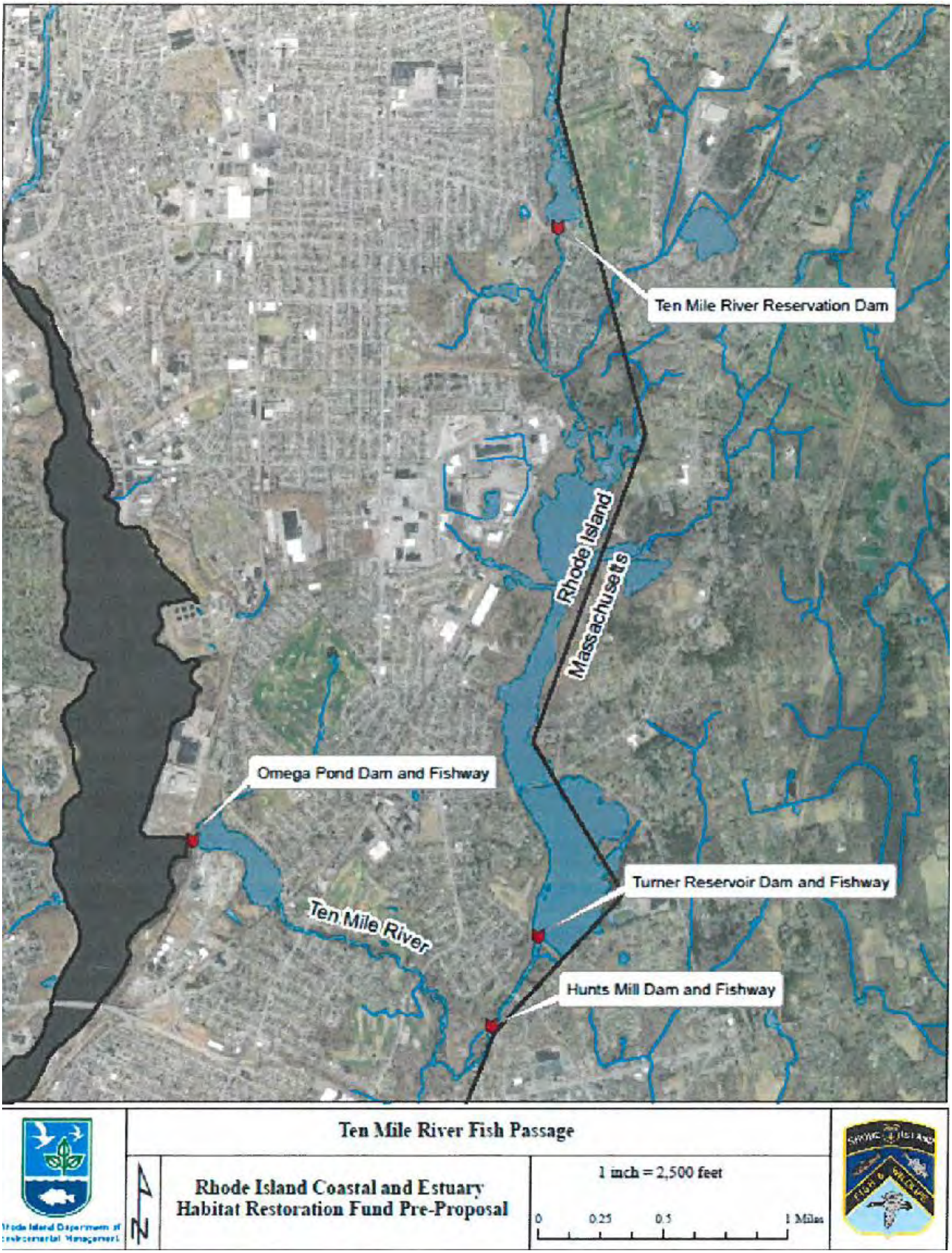


Figure 4: Map of lower Ten Mile River Watershed and location of Ten Mile River Reservation Dam.

Figure 5: Sediment sampling locations (red dot) & cross section locations (dashed pink lines).

Rhode Island
Department of Environmental Management

DIVISION OF FISH AND WILDLIFE
277 Great Neck Rd
West Kingston, RI 02892

401 789-0281
FAX 401 783-7490

January 25, 2023

Keith Gonsalves
Ten Mile River Watershed Council
P.O. Box 16611, 10 Newman Avenue
Rumford, RI 02916

RE: Ten Mile River Reservation Dam Assessment for Fish Passage

Dear Mr. Gonsalves:

This letter is in response to the Ten Mile River Watershed Council's request to apply for a CRMC Habitat Trust fund grant to continue to assess the state owned Ten Mile River Reservation Dam for dam removal to enhance fish passage and river connectivity. Rhode Island Department of Environmental Management's (RIDEM), Division of Fish &Wildlife (DFW) supports the Council's work on the fourth dam on the Ten Mile River to further investigate fish passage options. We understand this phase of the proposed fish passage feasibility study will include the following activities:

- consultation with RIDEM regarding water withdrawal rates and low flow requirements for the Pawtucket Country Club's water withdrawal and consultation on the field data gathered including sediment sampling results, any additional sediment characterization to develop a sediment management plan, potential sediment management techniques and potential in river modifications for fish passage enhancement at low flow conditions
- further characterization of chemical constituents of sediment to refine the sediment management plan
- baseline LiDar mapping
- assessment of the Lebanon Mill dam upstream of the State Reservation Dam, and
- conceptual design development of potential dam removal, and conceptual design of selected alternative for irrigation supply

The Ten Mile River Watershed Council and partners have permission to complete the assessment work described above. Please coordinate with Patrick Mcgee (DFW) and if access above the dam is required outside of state property, permission will have to be requested from private landowners.

Sincerely,
Phil Edwards
Phil Edwards, Chief, RIDEM Division of Fish & Wildlife

CC: Jason McNamee, Ph.D. Deputy Director, RIDEM Bureau of Natural Resources
Patrick McGee, RIDEM DFW, Principal Fisheries Biologist

TOWN OF SEEKONK
CONSERVATION COMMISSION

January 6, 2023

Caitlin Chaffee, Reserve Manager
Narragansett Bay National Estuarine Research Reserve
RI Dept. of Environmental Management
235 Promenade Street
Providence, RI 02908

Dear Ms. Chaffee,

The Town of Seekonk's Conservation Commission enthusiastically supports the Ten Mile River Watershed Council's application for a Rhode Island Coastal and Estuary Habitat Restoration Fund grant to conduct conceptual design development of the river restoration at the Ten Mile River Reservation dam for fish passage alternatives, primarily removal of the dam and restoration of a free-flowing river channel.

Seekonk has been interested in assessing municipally-owned dam structures, and has worked toward assessing structures along the Runnins and Ten Mile Rivers, which both suffer from water quality impacts and degraded riparian corridors with limited public access. Dam infrastructure was identified in our Community Resiliency Building (CRB) workshop process, and we agree that addressing dams in the Ten Mile River is a high priority item as a vulnerability for the Town and its residents in the face of climate change impacts

The Town is currently pursuing cleanup and dam removal at Attleboro Dye Works, just upstream of the Ten Mile Reservation dam. We support the Ten Mile River Watershed Council's project to potentially bring fish past the RI border into Massachusetts, making the river more connected and resilient.

Respectfully,

Chairman
Seekonk Conservation Commission

AUTHORIZED SIGNATURE

AUTHORIZED AGENT OF LEAD ORGANIZATION

Signature _____ Date 1/27/2023

Return your completed proposal by 4:00 p.m. on **January 28, 2022** to:

Caitlin Chaffee
NBNERR
RI Dept. of Environmental Management
235 Promenade Street
Providence, RI 02908

caitlin.chaffee@dem.ri.gov

Applicants are required to submit one (1) signed hard copy of the proposal form and one (1) electronic copy in Adobe PDF format. **Please submit electronic copy as a **SINGLE PDF FILE** containing all application materials.**

Contact Caitlin Chaffee at **401-222-4700 ext. 277-4417** with any questions.

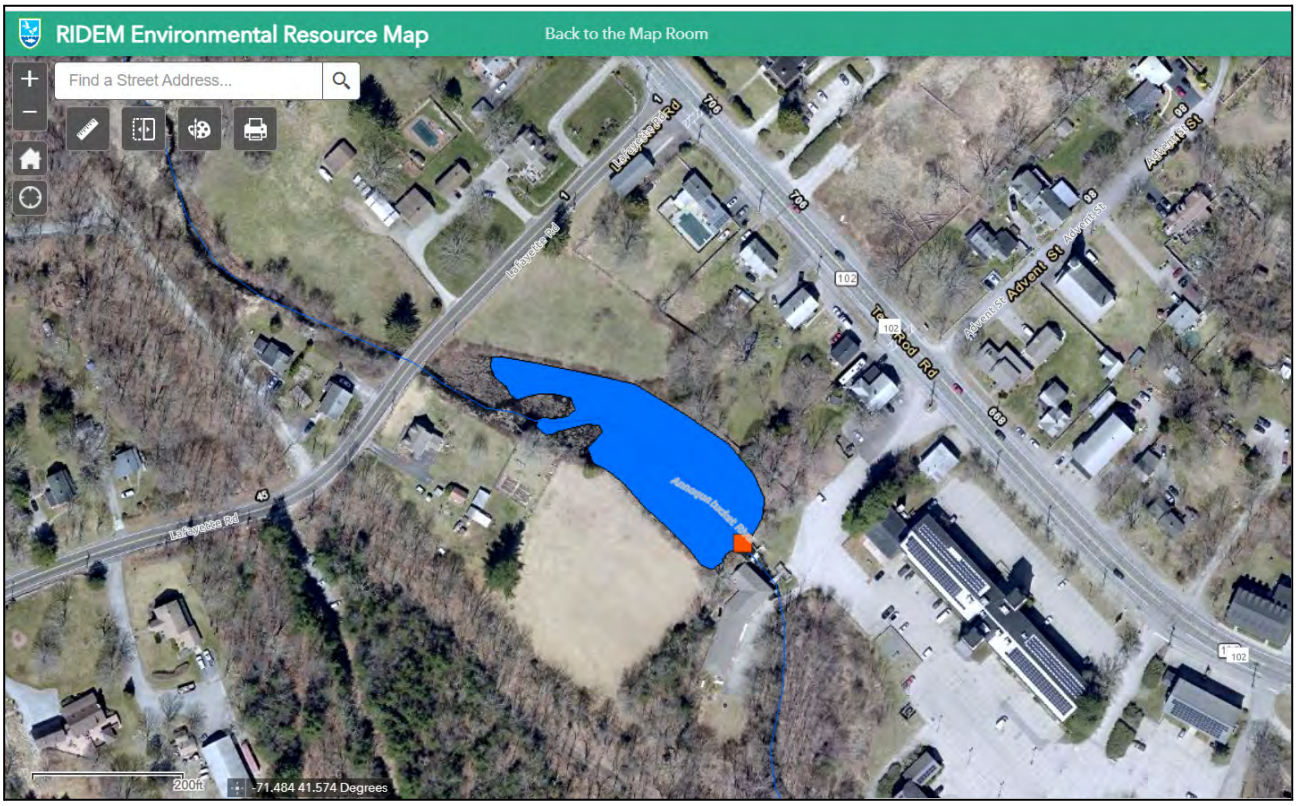
Full Proposal Form 2022/2023

****for planning projects please use Full Proposal Form for Planning Projects**

I. PROJECT SUMMARY

1. **Project Title:** Reconnaissance and Assessment of Dam Removal at the Rodman Mill Dam, and Associated Site Improvements to Enhance Climate Resiliency on the Annaquatucket River in North Kingstown, Rhode Island

2. **Project Location and coordinates** *(include map)*: The Rodman Mill Dam is located west of the Lafayette Mill Complex located at 650 Ten Rod Road in North Kingstown, Rhode Island.



3. **Project type** *(Design, Construction or Other)*: Planning

4. **If other, please specify:** Not applicable

5. **Habitat type** *(River System, Salt Marsh, Seagrass, Shellfish Bed, other)*: River System

6. **If other, please specify**: Not applicable

7. **Restoration technique** *(e.g. re-vegetation, tidal restoration, etc.)***:** Dam Removal

8. **Total acreage or miles(river systems) of habitat to be restored, or project area planning unit size:** Removal of the dam would restore a 1 acre millpond to a riverine system, and open up approximately 2.7 miles of stream habitat for fish passage.

9. **Project benefits:** Increased river connectivity for aquatic organisms including river herring, improved water quality by removing impoundment and revegetation of forested wetland and shrub swamp along the riverbanks.

10. **Project partners** *(organizations providing financial or other support to the project)***:** Bakeford Properties LLC (property owner), Town of North Kingstown

11. **Is this is an ongoing project that has previously received funds from the CRMC Coastal and Estuarine Habitat Restoration Fund?** No **If yes, year(s) funding was awarded:** Not applicable

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II. PROJECT MANAGER CONTACT INFORMATION

1. **Name:** Kate McPherson

2. **Organization:** Save The Bay

3. **Address:** 100 Save The Bay Drive

4. **City:** Providence **5. State:** RI **6. Zip:** 02905

7. **Phone:** 401-272-3540 **8. Email:** kmcpherson@savebay.org

9. **Property Owner:** Michael Baker (Bakeford Properties LLC). The Rodman Mill Dam is owned by the Condo at Lafayette Mill (previously called the Lafayette Mill Complex Associates). The Condo at Lafayette Mill is also responsible for the operation and maintenance of the dam, and downstream areas included in this project. Mr. Michael Baker is the owner and primary point of contact for the Condo at Lafayette Mill.

   Applicant must document ownership of project site or permission to perform all proposed restoration, maintenance and monitoring activities *(see attached letter from Mr. Baker on pg 18).*

III. BUDGET SUMMARY

(List individuals or organizations providing financial or in-kind support to the project under Project Partners)

Amount Requested from Trust Fund		**$25,000**
Matching Funds	**Project Partner(s)**	**Amount of Match**
In-Kind	Kate McPherson (Save The Bay)	$1,770
In Kind	Save The Bay (Overhead)	$1,677
	TOTAL PROJECT COST	**$28,437**

IV. PROPOSAL NARRATIVE (five pages maximum)

1. Justification and Purpose

Describe the human impacts and previous restoration activities at the proposed project site. If multiple sites, please describe the impacts and previous restoration activities at each). Briefly describe the proposed project, its restoration goals, long-term and short-term outcomes.

Save The Bay seeks to reconnect anadromous fish habitat to the upper Annaqutucket River in North Kingstown, Rhode Island. The section of river proposed for restoration was dammed and channelized over 150 years ago when the Rodman Mill Dam was built to support mill operations at the Rodman Mill Complex that processed cotton and wool from the 1840s to mid-1900s. The proposed anadromous restoration will be accomplished by removing Rodman Mill Dam and restoring the artificially straightened channel downstream of the dam. The dam removal will restore fish passage to 2.7 miles (approximately 44%) of the upper Annaquatucket River. To further enhance restoration at the dam site, a section of river below the dam that was artificially straightened will be restored, and stormwater from an adjacent road will be diverted into a newly constructed wetland to help treat the stormwater before it enters the river. This project will be a model of a comprehensive site approach at a mill site, balancing the current uses of the site with current regional and state conservation goals and objectives. There are thousands of mills across New England, and this project approach will serve as a template for projects at other privately owned dams sites to restore riverine migratory corridors, treat stormwater, and enhance resiliency while protecting their features and character.

The short term goal of this project is to better understand restoration options onsite, including conducting a dam removal reconnaissance study at Rodman Mill Dam. The long-term goal for this project is to provide upstream fish passage to the Annaquatucket River, increase the resilience of this river system by restoring a free-flowing river and improve the water and habitat quality in the impoundment.

2. Project Activities, Schedule and Work Plan

Describe the planned on-the-ground project activities, and explain how each activity will help to restore ecosystem functions. List specific project activities and when they will occur (month and year). Indicate when annual and final project reports will be submitted.

Project Activities To Date:
EA Science Engineering and Technology had identified this dam as a priority for removal given downstream restoration efforts and contacted the owner Michael Baker, who was interested in a removal project. In 2020 Mr. Baker partnered with EA Engineering and the RI Chapter of Trout Unlimited to submit grant applications for full reconnaissance, design, permitting, and dam removal to the Southeast New England Program (SNEP) watershed grants program, and to RIDEM under the Climate Resiliency Fund grant program. Save The Bay submitted a letter of support to Trout Unlimited for these grant proposals. The SNEP grant application was awarded, however the RIDEM grant was not, and the project did not move forward because the RIDEM grant was intended to be the matching funds for the SNEP grant. Without funding, no abutter outreach or communication has occurred to-date.

On November 8, 2022 a site meeting with Michael Baker, EA Engineering (Amy Hunt and Sal DeCarli), Save The Bay (Kate McPherson, Wenley Ferguson, and Ben Gaspar), and the Town of North Kingstown (Nicole LaFontaine, North Kingstown's Director of Planning and Development, as well as other North Kingstown town staff) was convened to explore options for the Rodman Mill Dam. The project team discussed the broad scope of the previous grant applications. The group decided to scale back the project significantly, to a reconnaissance study to address some of the complex challenges of the site which may include stormwater

inputs from town and state roads, upstream bridge abutments, driveway access across the Annaquatucket, and buildings owned by Michael Baker immediately downstream of the dam.

Permission from the landowner, Michael Baker to proceed with the reconnaissance study has been secured. Mr. Baker purchased the Rodman Mill and associated buildings (now referred to as the Lafayette Mill Complex) in 1987. After the mill's purchase, Mr. Baker oversaw years of construction and contractors on site as he orchestrated the complex redevelopment of the mill. The mill is now is fully restored and provides over 50,000 square feet of office space for renters. Mr. Baker has significant experience coordinating and managing construction projects at the project site. As the property owner/manager, Mr. Baker will work closely with Save The Bay throughout the project. Trout Unlimited is no longer interested in managing the project, but remains supportive of this river restoration project.

Planned Project Activities:
The project team will develop a scope of work for a reconnaissance study. An engineering firm will be hired by Save The Bay to conduct the assessment. The reconnaissance study will include the following tasks:

- Structural assessment of the spillway and structures tied into the spillway
- Collection of three sediment samples for physical and chemical analysis (two upstream and one downstream of the spillway)
- Estimate of sediment volume using sediment probes and depth-to-refusal information
- Assess water uses including potential water withdrawals from within the impoundment
- Review of stormwater inputs to the river from state and local roads.
- Assess potential effects of a lower water level on upstream infrastructure.
- Review of endangered species habitat records
- Develop proposed restoration approach and costs estimates
- Outreach to abutters and stakeholders

The project team considered adding funding for specific engineering deliverables such as a scour analysis and HEC-RAS modeling, however deliberately wanted to scale down the project to be more manageable and not dedicate too much public funding before the initial reconnaissance recommendations are carefully considered.

Project Timeline:

Spring 2023:	Develop a scope of work for the reconnaissance study.
Summer 2023:	Hire engineering firm to conduct the study. Project partners conduct a site visit with the engineering firm at the dam and impoundment.
Fall 2023:	Consultant develops a draft report. Partners review and share with the dam owner, RIDEM Division of Fish and Wildlife and the Town of North Kingstown.
Winter 2023:	Reconnaissance study finalized and CERHTF final report submitted. Decide next steps to advance long term goals.

3. Minimization of Adverse Impacts

What are the potential impacts resulting from project activities (e.g. the disturbance of sensitive species by construction activities), and how will these impacts be minimized (e.g. scheduling construction to avoid disturbance of sensitive species).

Since this phase of the project is purely information gathering, it is anticipated that minimal impacts to the wetland system will occur. For sediment characterization, the proposed sampling will be done by handheld equipment deployed from a boat with minimal disturbance to sediments. Access to the river and pond will be from property owned by Bakeford Properties, east and north of Rodman Mill Pond.

Dam removal construction activity is not part of this grant application, but when it occurs, permitting agencies may restrict in-river construction to July 1st to October 31st to minimize disturbances to river species. The time of year restriction is to ensure that construction within the River will occur when flows are generally at their lowest. Later in the planning process, a potential construction sequencing scenario to minimize adverse impacts from the dam removal that addresses dewatering, sediment management, potential stormwater management to address outfalls and site stabilization measures will be developed.

4. Public Support

Demonstrate public support for the project by providing evidence of communication with adjacent landowners, community members and other stakeholders. Describe planned or completed community / stakeholder education and outreach efforts.

The project team has discussed the potential restoration project with the Town of North Kingstown and Trout Unlimited. We will share the final Reconnaissance Report and the concept design for dam removal with RIDEM Division of Fish and Wildlife, RIDEM Office of Dam Safety, and involve members of the Lafayette Mill community. This project is in the very beginning stages of planning and so no outreach to the public has started. After the completion of the sediment sampling, the modeling, and discussion with the land owner, the project partners will hold a meeting with stakeholders, abutters, and interested members of the public. Save The Bay will share updates with members and supporters through Save The Bay publications and social media.

5. Economic and Educational Benefits

How will the proposed project provide direct economic and/or educational benefits to a community and/or the state?

Removal of this high hazard dam will reduce long term inspection and maintenance costs of the dam for the property owner, as well as reduce the workload for RIDEM Office of Dam Safety.

Rodman Mill Dam is 1.5 miles away from the Wickford Middle School. The property is also adjacent to Ryan Park, a popular place for open space recreation. As such, a future river restoration here can highlight to the public specific adaptation strategies that can be implemented to restore riverine habitats. There may be future opportunities to install interpretive signage about the benefits of riverine restoration for water quality, increased river connectivity for anadromous and riverine species and improved habitat conditions for spawning. As an educational tool, the dam removal will show habitat restoration in action. Fishing for riverine species will likely improve as well.

Many mill sites in Rhode Island are privately held and face the same challenges that the Lafayette Mill Complex does, and this project can be a showcase for other dam owners and redevelopers to emulate and ultimately better understand how green infrastructure improvements, resiliency, and ecological restoration can come together at their mill sites while maintaining the aesthetic attributes of old mills.

6. Climate Change and Coastal Resiliency

How have the present and future impacts of climate change been considered during the project planning and design phases? What impact will the project have on resilience of coastal or estuarine habitat to climate change?

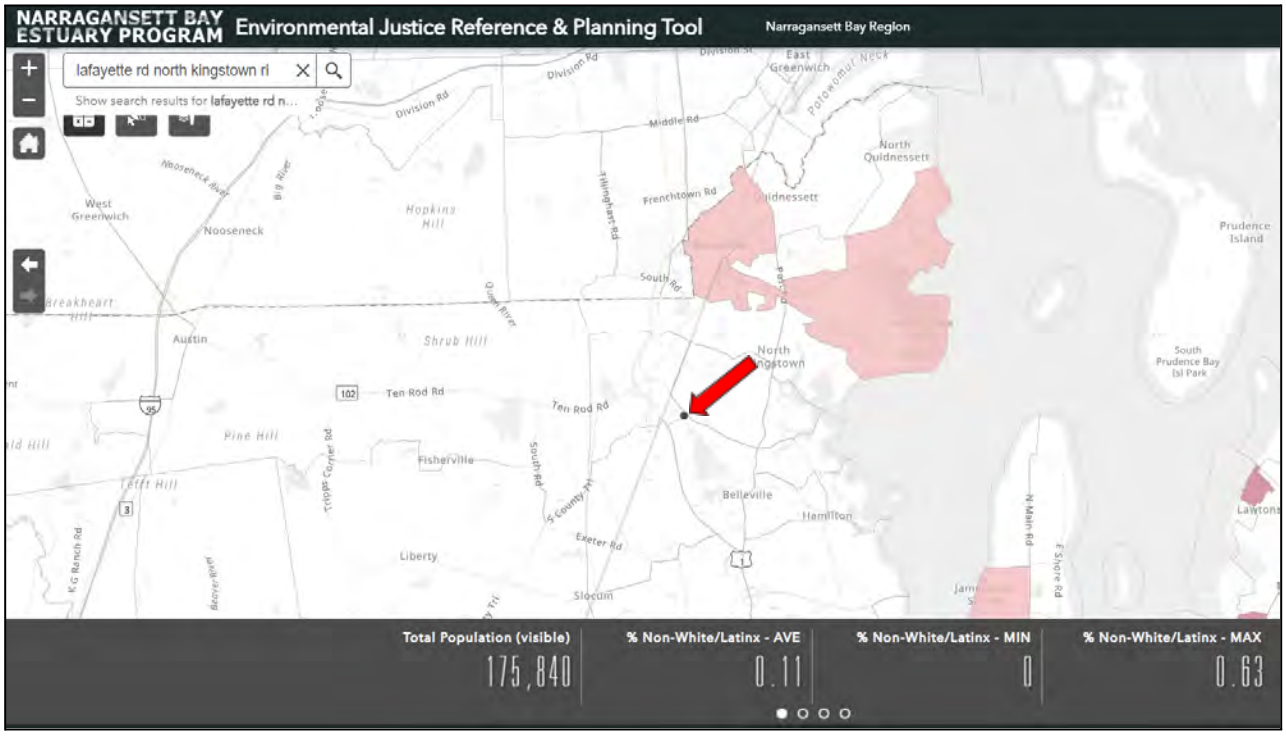
Like so many dams across Rhode Island and New England, the Rodman Mill Dam is in poor condition. The Rodman Mill Dam was constructed over 150 years ago, and as a result was not built to meet today's design/construction standards or stream flows. One of the many trends of climate change is the increased intensity and recurrence of severe storm events. As such, this dam is at an increased risk of failure. The Rodman Mill Dam is a High Hazard Dam, and was assessed by a RIDEM contracted consultant in 2018. That

consultant identified several deficiencies with the dam embankments, structural components, and downstream channel. Some of these issues included deterioration, undermining and cracking. Several of these dam issues have proved difficult for the Dam owner to mitigate, and repeated storm events continue to exacerbate these issues. Thus, the primary resilience issue this project addresses is that of human safety and protection of existing infrastructure by removing the Rodman Mill Dam and restoring the river and downstream areas to a natural stream channel by mimicking the natural channel once in place at the site prior to the construction of the dam.

This project will improve ecosystem and community resiliency by providing the dam owner with a range of restoration options and cost estimates. This site is complex, and a future dam removal would remove a piece of hazardous infrastructure from the community. The removal of the Rodman Mill Dam would eliminate the risk of loss of life related to a dam failure. In addition, the approximately 2.7 miles of stream that are restored once the dam is removed will allow for the reproduction of hundreds of millions of blueback herring and alewives of the next 25 years. These species are critical to the health of Narragansett Bay and the public use of the Bay resources.

7. Environmental Justice

Will the proposed project take place within or otherwise benefit environmental justice "priority areas" as defined by the Narragansett Bay Estuary Program's analysis of Environmental Justice in the Narragansett Bay Region? Does the proposed project incorporate Environmental Justice concerns as defined by the US EPA's Guidance on Environmental Justice and Equitable Development?



The project takes place in North Kingstown, RI and is not within any environmental justice priority areas. The Annaquatucket is a relatively small watershed that flows directly into Narragansett Bay, and there are no known EJ areas within the watershed. The concerns outlined in EPA's Guidance on Environmental Justice include equitable development. Equitable development is a place-based approach for encouraging environmental justice. In the context of environmental justice and planning, equitable development improves public involvement; supports collaborative problem solving; and makes a visible difference in communities that are underserved, under-resourced, and overburdened. Lower-income community members and people of color are successfully guiding the changes that occur within their communities rather than reacting to them. The project team will seek to work with members of the community when planning any eventual river restoration.

8. Planning Consistency and Restoration Priority

Is the proposed project consistent with the goals of a local, state or regional planning initiative? Please specify initiative and explain (see CRMC website for guidance). Does the proposed project involve a state, regional or federal priority habitat restoration need or special consideration? Please specify and explain (see CRMC website for guidance).

The Annaquatucket River has been the focus of anadromous fish restoration projects by RIDEM and TNC including fish ladders at the Bellville Pond Dam and Hamilton Reservoir Dam. This dam remains the last obstruction to fish passage in this system, and removal would restore river connectivity and provide access to approximately 2.7 river miles of spawning habitat in the Annaquatucket River up to the Lafayette Trout Hatchery.

9. Species of Concern

Will the project result in benefits to wildlife species listed as federally or state endangered, threatened, or species of concern within Rhode Island? Please specify which species will benefit and how.

The section of the Annaquatucket River that is impeded by the Rodman Mill Dam is within a Natural Heritage Area (data updated July 2020, see Figure 6). As part of this initial reconnaissance study, STB will contact Rhode Island Natural Heritage Society to understand what species have been documented in the area. In general, the inclusion of land within a Natural Heritage Area is an indicator of high quality habitat and the potential benefit for many species, not just rare one. River restoration can and does benefit rare species including freshwater mussels, and anadromous fish, which are negatively impacted by dams within their ranges.

10. Permitting

List any federal, state or local permits required to complete the project and the permit application status for each.

At this stage of the project no federal, state, or local permits are required to complete the reconnaissance study. However, once a project has been selected we anticipate the following permit applications:

- State: RIDEM Wetlands Application to Alter Freshwater Wetlands
- Federal: Army Corps of Engineers General Permit
- State: Review by the Rhode Island Historical Preservation & Heritage Commission

11. Capacity of Lead Organization (attach additional materials if necessary)

Demonstrate the capacity of the lead and/or partner organizations to successfully complete the proposed project by providing any or all of the following: a) a description of the organization(s) b) resume(s) or summary of qualifications of involved personnel c) evidence of successfully completed habitat restoration or conservation projects.

Save The Bay has a long track record of successful restoration projects funded through the Trust Fund. We have been project proponents as well as supporting partners. We have been partners on dam removal and fish passage projects on the Pawcatuck, Pawtuxet, Ten Mile, Kickemuit and Blackstone Rivers. We have also successfully completed salt marsh restoration and riparian restoration projects throughout the watershed. Kate McPherson, Save The Bay's Narragansett Bay Riverkeeper and Professional Wetland Scientist will be the project lead on the completion of this project.

V. SUSTAINABILITY (one page maximum)

1. Maintenance

What is the estimated "lifespan" of each planned restoration activity? What are the anticipated short-term and long-term (beyond the funding period) operation and maintenance requirements of the project? Specify who will be responsible for funding and carrying out each O & M activity. Indicate when and with what frequency activities will occur.

This phase of the project does not have maintenance associated with it. An ultimate dam removal restoration would be designed to provide fish passage into the future with little maintenance required. At this stage in the project it is not clear what sort of design elements or associated required maintenance would be incorporated into a dam removal proposal.

2. External Factors

Identify existing external (off-site) factors that could reduce the chances of achieving the project goals (e.g. stormwater inputs to the site from the surrounding drainage area). Explain how these external factors will be addressed. Describe any additional measures taken to help ensure long-term success of the project (e.g. installation of stormwater management practices or securing of conservation easements).What are the likely future effects of climate change and future sea level rise on the proposed project and how will these be addressed?

This site is somewhat impacted by stormwater runoff. For the potential future design of dam removal here the project team intends to incorporate a conceptual design of stormwater management and green infrastructure. Stormwater inputs include at least a stormwater outfall from Ten Rod Road owned by RIDOT, possible additional outfalls from Lafayette Road owned by the Town of North Kingstown, as well as runoff from the impervious surfaces of the mill complex. The typical contaminants in stormwater runoff from developed areas and roadways are expected to be present in the river. There are some pipes discharging flow to the river downstream of the dam or near the dam from other adjacent land uses, and part of the reconnaissance study will include determining ownership, source of water, and plans to address existing stormwater and flooding impacts. We are not aware of any buried infrastructure along the edge of the Pond/River, or beneath the Pond/River. The Town of North Kingstown will be made aware of the results of the reconnaissance study, and may provide data, as well as representatives from RIDOT if required.

VI. EVALUATING PROJECT SUCCESS (one page maximum)

1. Performance Measures

How will the success of the project be measured in relation to the restoration goals set forth in this proposal? List performance measures and how they will be recorded. Include a detailed monitoring plan; if applicable (see below).

This stage of the project will be evaluated as a success when the data for the reconnaissance report has been collected, sampling has been conducted, and a final report has been prepared. We will share this with stakeholders and members of the Lafayette Mill Village community and solicit feedback. It is the project team's experience that it is often easier to find funding sources for construction projects, and we will seek diverse funding sources for engineering, permitting and construction in the future.

2. Monitoring Plan

Describe any planned or completed pre- and post-project monitoring activities. For each monitoring activity list the frequency and month/year of start and end date and the parameters measured. List the entity or entities responsible for funding and carrying out each monitoring activity, and describe how results will be made available to CRMC and the public. If using an established monitoring protocol, please provide references (see CRMC website for information on established monitoring protocols).

Since this project is still in initial development a monitoring plan of the impoundment area is not required at this time, however, in other dam removal projects factors STB has monitored for include wildlife use, monitoring for nonnative invasive species, sediment accumulation that may block aquatic organisms, and fish migration monitoring, if appropriate.

VI. PROJECT BUDGET TEMPLATE

BUDGET CATEGORY	CRMC REQUEST	MATCH	MATCH PENDING OR SECURED? (select one)	SOURCE OF MATCH	TOTAL
Engineering Dam Assessment	$22,460	$0	Not Applicable	Not Applicable	$22,460
Save The Bay staff	$2,540	$1,770	Secured	In-Kind, STB Staff Time	$4,310
Save The Bay overhead	$0	$1,677	Secured	In-Kind, Save The Bay	$1,677
TOTAL	**$25,000**	**$3,447**		**TOTAL PROJECT COST**	**$28,447**

VII. BUDGET NARRATIVE (one page maximum)

Please provide a description and justification for each line item included in the project budget form (e.g. for personnel costs, provide hourly and fringe rates, for travel specify rate and estimated number of miles). Please specify any match requirements for each source of funding. Please include costs associated with required annual and final reports to CRMC. Be sure to detail how CRMC funds will be used.

Engineering assessment and sampling $22,460 CRMC Ask | $0 Match | $22,460 Total Cost

An Engineering firm will be hired to support this project on 9 distinct tasks - Structural assessment of the spillway and structures tied into the spillway, Collection of three sediment samples for physical and chemical analysis (two upstream and one downstream of the spillway), Estimate of sediment volume using sediment probes and depth-to-refusal information, Assess water uses including potential water withdrawals from within the impoundment, Review of stormwater inputs to the river from state and local roads, Potential effects of a lower water level on upstream infrastructure, Review of endangered species habitat records, Proposed restoration approach and costs estimates, and outreach to abutters and stakeholders. The project work includes time for all necessary labor and direct costs for the project.

Save The Bay $2,540 CRMC Ask | $3,447 Match | $5,987 Total Staff & Overhead Costs

Kate McPherson, Narragansett Bay Riverkeeper and Professional Wetland Scientist, will support this project through communication with the property owner, project management, field work with the engineering firm, meetings with RIDEM and partners, assist with outreach to abutters and stakeholders and other tasks as necessary to complete the project. Kate will support this project for 60 hours (40 hours of in-kind match). Charges calculated using Kate's hourly billable rate of $44.25 which includes the organization's 27% fringe benefit rate for all staff. Additional staff will support this project through review, approval, and administration of the engineering contract, billing, and recordkeeping. Save The Bay will also contribute a 10% overhead and administration rate as match towards this grant. Funding for Save The Bay's staff time is partially provided by a Capacity Building Grant from the Narragansett Bay Estuary Program.

IX. ADDITIONAL MATERIALS

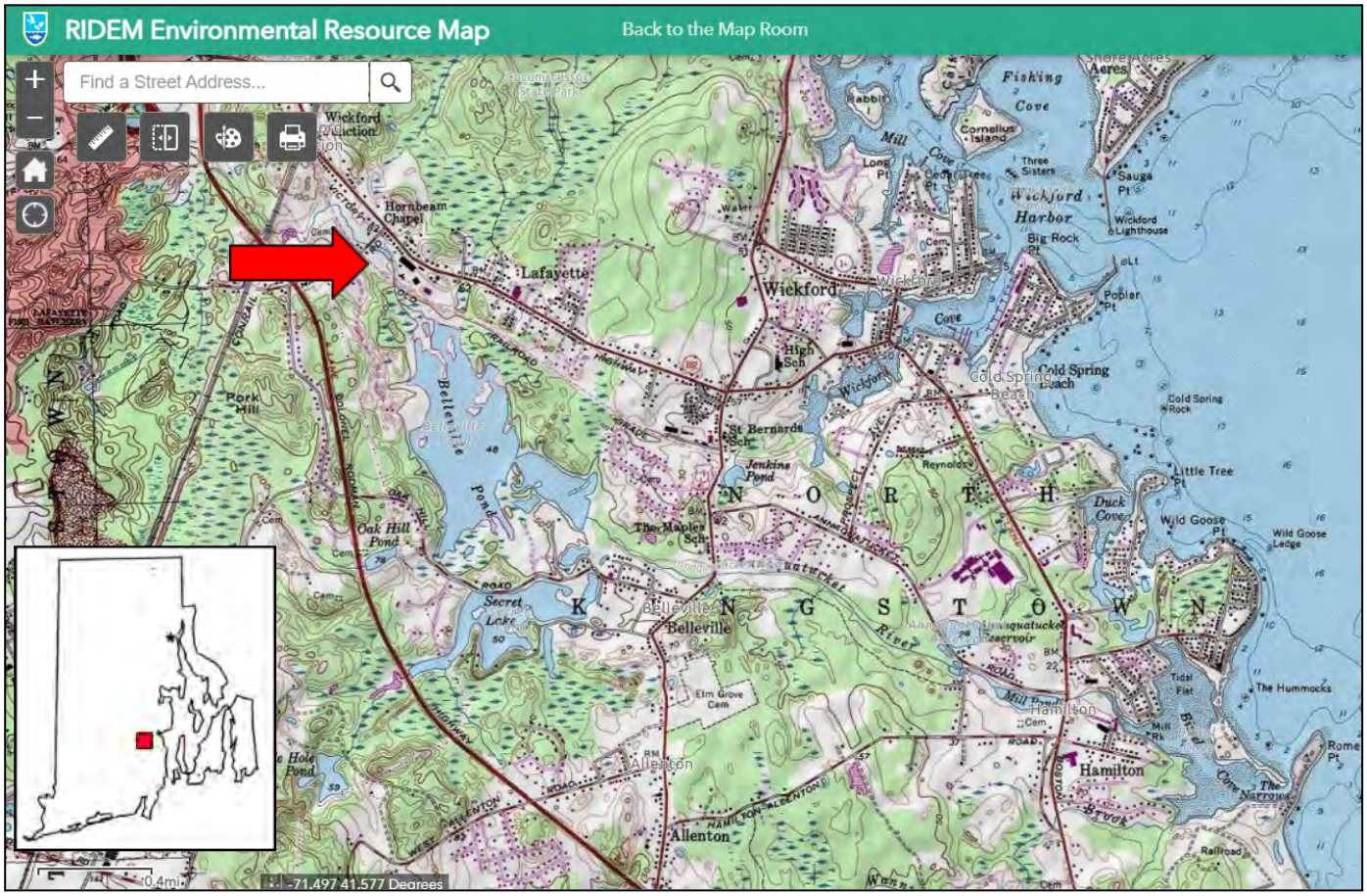


Figure 1: Locus Map featuring a USGS Topographic Map Wickford Quadrangle depicting the Annaquatucket River and the project's proximity to Narragansett Bay. Red arrow points to Rodman Mill Pond and the dam location.

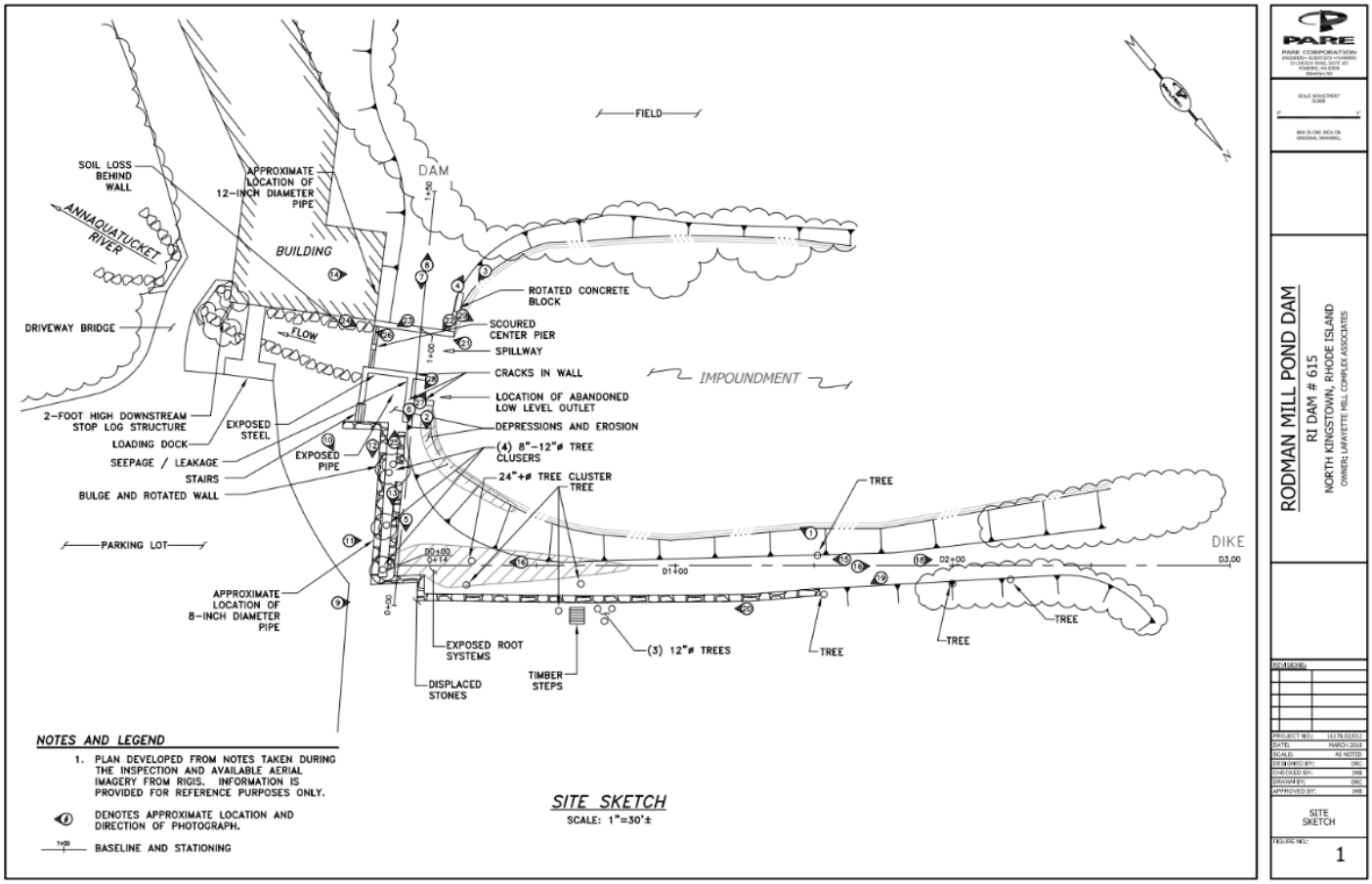


Figure 2: Site Sketch taken from "Rodman Mill Dam Visual Inspection/Evaluation Report" prepared by Pare Corporation following a March 20, 2018 dam safety site inspection. Sketch depicts the impoundment, dam and spillway structures, and infrastructure owned by Mr. Baker including a building in close proximity to the spillway and a driveway bridge that crosses the river downstream of the dam.

Figure 3: Photo taken during November 8, 2022 site meeting of the Rodman Mill Dam spillway, within the Annaquatucket River in North Kingstown. Property owner Michael Baker is located in the top right corner of the photograph describing site conditions.

Figure 4: View northwest of the impoundment looking upstream from dam structure. Photo taken November 8, 2022.

Figure 5: Spring aerial photograph (spring 2021) depicting the property owned by Condo at Lafayette Mill/Michael Baker (outlined in green). Imagery provided by Town of North Kingstown MapGeo. Red arrow points to the dam.

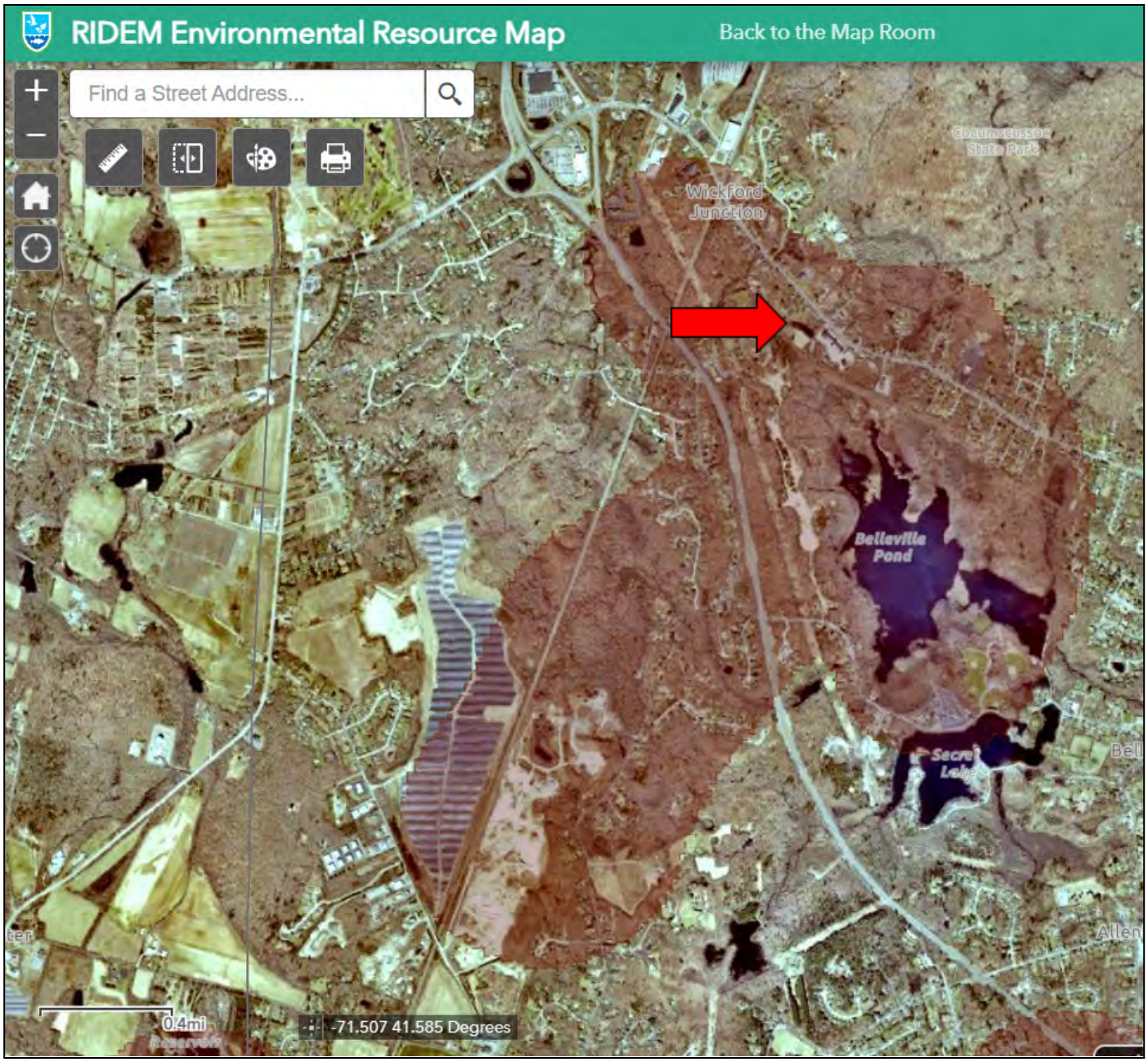


Figure 6: The property is within a Natural Heritage Area (updated December 2022). One of the tasks will be to determine which rare species might benefit from a river restoration here. Red arrow points to the Rodman Mill Pond impoundment.

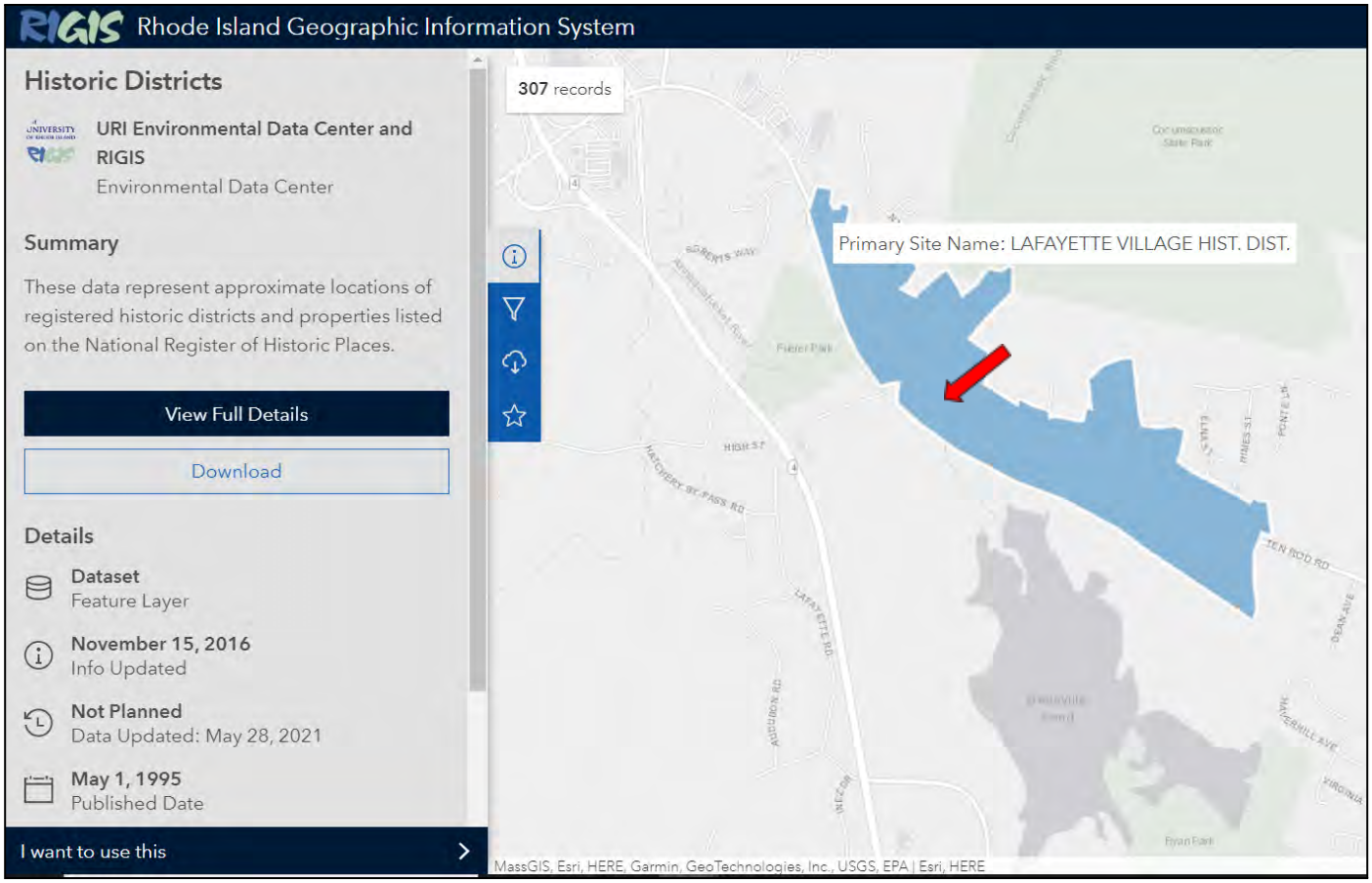


Figure 7: The property is within the Lafayette Village Historic District. Part of the reconnaissance study will include determining historic preservation requirements.

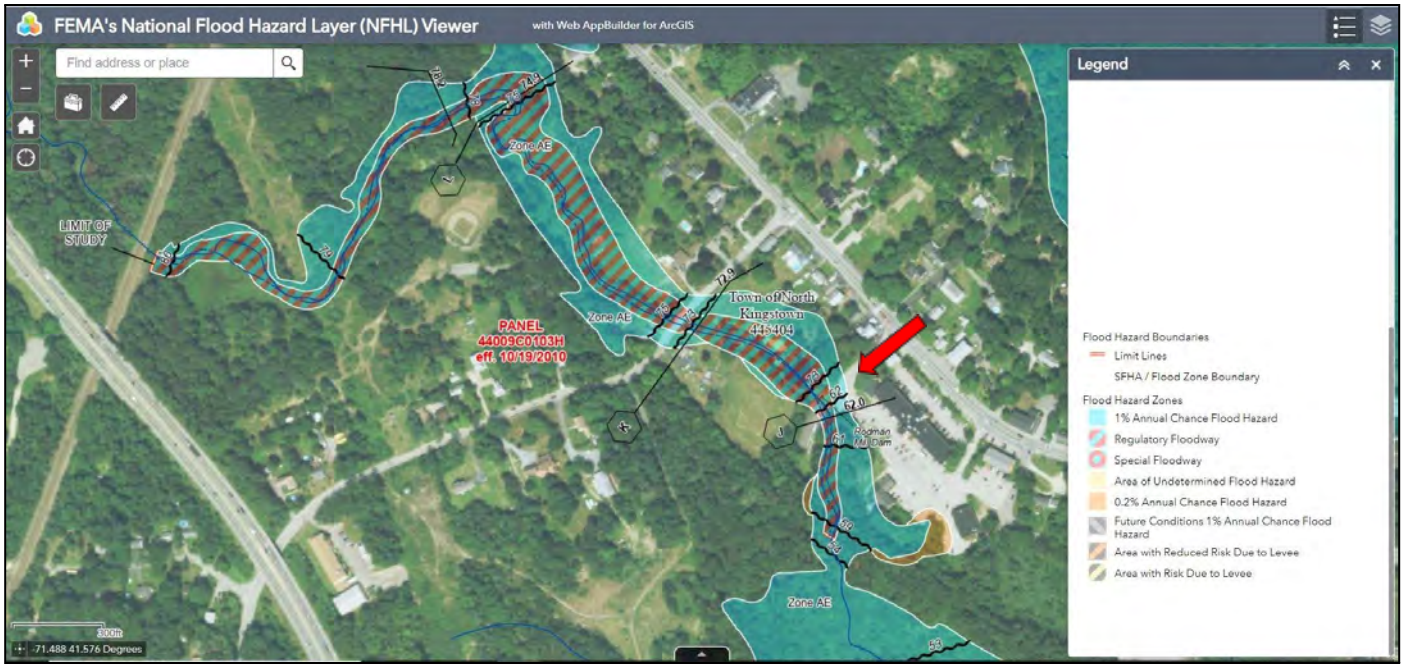


Figure 8: Floodplain and floodways as mapped by Federal Emergency Management Agency (FEMA) of the Annaquatucket River. Red arrow points to the dam. Rodman Mill Dam is categorized as a high hazard dam by RIDEM's Office of Dam Safety.

Letters of Support

January 4, 2023

Dear Caitlin Chafee,

I am Michael Baker, owner of Bakeford Properties LLC and the Mill at Lafayette (Assessor's Plat 7, Lot 11 in North Kingstown), and I have given permission to Save The Bay to apply for Rhode Island Coastal and Estuary Habitat Restoration Funds to to better understand restoration options onsite, including conducting a dam removal reconnaissance study at Rodman Mill Dam. The long-term goal for this project is to provide upstream fish passage to the Annaquatucket River, increase the resilience of this river system by restoring the river and improve the water and habitat quality in the impoundment.

Sincerely,

Mike Baker
Bakeford Properties LLC
Mill at Lafayette
Owner/Manager

AUTHORIZED SIGNATURE

AUTHORIZED AGENT OF LEAD ORGANIZATION

Signature **Date** **1/27/2023**

Return your completed proposal by 4:00 p.m. on **January 27, 2023** to:

Caitlin Chaffee
NBNERR
RI Dept. of Environmental Management
235 Promenade Street
Providence, RI 02908

caitlin.chaffee@dem.ri.gov

Applicants are required to submit one (1) signed hard copy of the proposal form and one (1) electronic copy in Adobe PDF format. **Please submit electronic copy as a **SINGLE PDF FILE** containing all application materials.**

Contact Caitlin Chaffee at **401-222-4700 xt. 277-4417** with any questions.

SAVE THE BAY
NARRAGANSETT BAY

THE BAY CENTER
100 Save The Bay Drive
Providence, RI 02905
phone: 401-272-3540
fax: 401-273-7153
savebay@savebay.org
www.savebay.org

EXPLORATION CENTER
Easton's Beach
P.O. Box 851
Newport, RI 02840
phone: 401-324-6020
fax: 401-324-6022

SOUTH COAST CENTER
Riverside Building
8 Broad Street
Westerly, RI 02891
phone/fax 401 315 02891

January 27, 2023

Caitlin Chaffee, Narragansett Bay Estuarine Research Reserve
RIDEM
295 Promenade Street
Providence, RI 02908

Dear Caitlin,

Please find attached Save The Bay's proposal titled "Restoration of Legacy Agricultural and Mosquito Control Impacts to Galilee Salt Marsh" for funding from the Coastal Resources Management Council's Coastal and Estuarine Habitat Restoration Trust Fund. Save The Bay is partnering with the Rhode Island Department of Environmental Management's Division of Fish and Wildlife and Mosquito Abatement Program on the proposed restoration project. RIDEM DFW is the landowners of the Galilee salt marsh.

Please feel free to contact me if you have any questions, 401-272-3540 ext. 105. Thank you in advance for your consideration of this proposal.

Sincerely,

Wenley Ferguson
Director of Restoration

Rhode Island Coastal and Estuary Habitat Restoration Fund
Full Proposal Form 2022/2023

****for planning projects please use Full Proposal Form for Planning Projects**

I. PROJECT SUMMARY

1. **Project Title:** Restoration of Legacy Agricultural and Mosquito Control Impacts to Galilee Salt Marsh
2. **Project Location and coordinates** *(include map)*: See parcel map below
3. **Project type** *(Design, Construction or Other)*: Construction/implementation and Monitoring
4. **If other, please specify:**
5. **Habitat type** *(River System, Salt Marsh, Seagrass, Shellfish Bed, other)*: Salt marsh
6. **If other, please specify**:
7. **Restoration technique** *(e.g. re-vegetation, tidal restoration, etc.)***:** tidal hydrology restoration
8. **Total acreage or miles(river systems) of habitat to be restored, or project area planning unit size:**
9. **Project benefits:** Restoration of tidal hydrology of the marsh platform to reduce subsidence and allow for revegetation
10. **Project partners** *(organizations providing financial or other support to the project)***:** Rhode Island Department of Environmental Management Division of Fish and Wildlife, RIDEM Mosquito Abatement Program, and USFWS Coastal Program
11. **Is this is an ongoing project that has previously received funds from the CRMC Coastal and Estuarine Habitat Restoration Fund? No If yes, year(s) funding was awarded:**

II. PROJECT MANAGER CONTACT INFORMATION

1. **Name:** Wenley Ferguson, Director of Restoration
2. **Organization:** Save The Bay
3. **Address:** 100 Save The Bay Drive
4. **City:** Providence **5. State:** RI **6. Zip:** 02905
7. **Phone:** 401-272-3540 ext. 105 **8. Email:** wferguson@savebay.org
9. **Property Owner(s):** Rhode Island Department of Environmental Management Division of Fish and Wildlife (RIDEM DFW) is the property owner and is a project partner.

Applicant must document ownership of project site or permission to perform all proposed restoration, maintenance and monitoring activities *(include appropriate documentation).*
Please see RIDEM DFW letter of authorization below.

III. BUDGET SUMMARY

(List individuals or organizations providing financial or in-kind support to the project under Project Partners)

	Amount Requested from Trust Fund	**40,500**
Matching Funds	**Project Partner(s)**	**Amount of Match**
Staff time	Save The Bay	7,962
Staff time	RIDEM DFW staff and Mosquito Abatement Program staff	14,099
Intern and volunteer time	Save The Bay interns and volunteers	3,474
	TOTAL PROJECT COST	**66,035**

The Coastal and Estuarine Habitat Restoration Trust Fund request of $40,500 will be used to fund an equipment operator, the use and transportation of RIDEM's low-ground pressure excavator, and Save The Bay's staff time to implement the restoration project and monitoring the site. Save The Bay's staff time to finalize the plans with RIDEM DFW and to develop and submit state and federal permits will be matched through a grant from the Narragansett Bay Estuary Program.

IV. PROPOSAL NARRATIVE (five pages maximum)

1. Justification and Purpose

The Galilee salt marsh is a 100-acre tidal wetland complex composed of a tidal creek, high salt marsh, and low salt marsh habitats managed for wildlife conservation and hunting by RIDEM's Division of Fish and Wildlife. This marsh became tidally restricted from Point Judith Pond in 1956 with the construction of the Galilee Escape Road, which originally included only one undersized culvert to accommodate tidal exchange. As a result of the muted tidal exchange, the salt marsh habitat became dominated by *Phragmites australis* over the next forty years. In 1997, RIDEM installed four self-regulating tide gates to enhance tidal exchange. The tidal gates were designed and calibrated to restore salt marsh habitat by re-establishing tidal connectivity to Point Judith Pond while preventing flooding of adjacent residential development bordering the marsh. Additional restoration activity occurred within the marsh, including installing tidal creeks and fill removal. The restoration of tidal exchange reduced the coverage of *Phragmites australis* throughout the entire marsh complex and increased native salt marsh vegetation.

Increased inundation has decreased the amount of suitable nesting habitat both through impounded water areas standing on the marsh surface and vegetation dieback. Additionally, the inability for the marsh platform to drain after higher tides or storm events increases the chances of nest and chick loss due to flooding.

Increased flooding events and salt marsh inundation is the leading cause of saltmarsh sparrow (*Ammodramus caudacutus*) nest failures, which had led to an annual 9% population decline across their range. Increased inundation has decreased suitable nesting habitat both through impounded water areas

standing on the marsh surface and vegetation dieback. Without immediate intervention to restore coastal salt marsh along the Atlantic Coast, the saltmarsh sparrow will likely be extinct within the next 50-years (Greenlaw et al. 2020). Currently, saltmarsh sparrows are nesting in the restored marsh area to the south of the Galilee Escape Road, but their nesting success continues to be impacted by tidal inundation (J. Herbert, pers. obs.) Inundation of the marsh platform and vegetation stress and die-off reduces the amount of suitable nesting habitat. In 1998, restoration monitoring found the saltmarsh sparrow population slightly decreased to approximately 35 breeding adults after the 1997 restoration project (DiQuinzio et al. 2002). This study hypothesized the decrease was likely due to the immediate effects of the restoration efforts and should increase after the short-term negative impacts diminish. Recent measurements in 2022 did find an increase of breeding saltmarsh sparrows of approximately 80 adults, but these individuals are restricted to a small section of the marsh that is not subject to higher flooding events (J. Herbert, unpublished data).

The salt marsh platform today has a significant amount of impounded water due to legacy human impacts that have restricted drainage off the marsh platform including agricultural features like embankments and ditch spoils from both agricultural and mosquito control activities. The earthen embankments, constructed by past farmers who hayed the marsh are still features that remain on the marsh today and impact hydrology (Adamowicz 2020). These human made features impound water on the marsh platform, causing vegetation to become stressed and die off and peat to subside (see Figure 2 Existing conditions photos of ditch spoils and agricultural embankments). In higher elevation areas, the embankments impound freshwater creating conditions suitable for the invasive, *Phragmites australis*, to outcompete more salt-tolerant species. Since the impounded water areas become warm and hypersaline during the summer months, they do not support fish species that feed on mosquito larvae and can create mosquito-breeding habitat.

Where waterlogging persists, a series of processes including vegetation die-off and root decomposition causes marsh platform subsidence. Without healthy plants to trap sediment and increase marsh surface elevation through the accumulation of belowground biomass, the marsh elevation cannot keep pace with accelerated sea level rise. Today, the marsh platform at Galilee is mainly dominated by *Spartina alterniflora* or stressed *Distichlis spicata*.

Since the self-regulating tide gates were installed over 25 years ago, RIDEM has secured funds to evaluate the integrity and suitability of the gates based on current hydrologic conditions (factoring in sea level rise and marsh elevation relative to the tidal prism) and to develop plans to repair and calibrate the self-regulating tidal gates. The purpose of the study is to identify potential structural or functional problems that affect the operation of the self-regulating tide gates controlling water levels within the marsh and to develop an operational plan for the gates to aid in prevention of marsh habitat loss. RIDEM's consultant, Woods Hole Group, has shared their initial analysis of the self-regulating tide gates with their project partners including Ducks Unlimited and Save The Bay. A component of this study was that Woods Hole Group would provide RIDEM with GIS products including LiDAR surveys of the marsh platform providing elevations for hydrological modeling of different self-regulating tide gate settings and sea level rise scenarios.

Save The Bay and RIDEM DFW are planning to collect RTK elevation data of the existing marsh community including low and high marsh species to provide target elevation growing ranges. Salt marsh community polygons will also be delineated in the field to identify representative high marsh areas. This data will be shared with the consultant in order to validate the LiDAR data to more accurately quantify existing and expected high marsh vegetation at current and predicted future water levels at 2040 (estimated at 6.6" of sea level rise under NOAA's Intermediate High Curve).

Save The Bay's proposed project is to restore tidal hydrology impacted by the legacy features on the salt marsh platform by creating runnels through the former agricultural embankments and linear ditch spoils and by maintaining a selective ditches to facilitate drainage. Restoring marsh platform hydrology can be done in the short-term as the modeling study is finalized to assess changes to the self-regulating tides gate's settings. Restoration of the marsh platform will complement the self-regulating tidal gates operational plan by ensuring any allowed tidal inputs to the marsh complex enter and exit efficiently. This will become increasingly important with sea level rise to fine tune the tidal inputs to both allow inundation to control *Phragmites* but prevent high marsh habitat loss through excess inundation stress.

The excavated peat from the runnels and the maintained ditches will be placed on the marsh platform in small islands to create structured microtopography. These peat islands are slightly higher in elevation and revegetate with either low or high marsh vegetation. This practice has been conducted by Save The Bay and RIDEM Mosquito Abatement since 2010. This strategy is included in the interagency Atlantic Coast Joint Venture's Saltmarsh Sparrow Conservation Plan (Hartley, M.J. and A.J. Weldon, eds. 2020) as a technique to increase saltmarsh sparrow breeding productivity and nest success by creating "microhabitats", small patches or "islands" of higher elevation that experience less flooding from extreme tides and larger rain events. Based upon experience from other projects where peat has been placed on the marsh surface, revegetation of the peat occurs after one growing season since the salt marsh vegetation roots stabilize the peat. The peat island locations will be identified in coordination with RIDEM's Non-game Biologist as a potential strategy to enhance saltmarsh sparrow nesting habitat.

Vegetation monitoring data from Save The Bay's similar restoration projects have shown greater vegetation coverage and less standing water on the marsh surface, including 8 years of pre- and post- monitoring data from a tidal hydrology restoration project at a grid-ditched marsh on Winnapaug Pond conducted by Save The Bay in 2013 (Besterman, 2022) and a 5 year study of tidal hydrology restoration at a marsh impacted by legacy agricultural features at the Narrow River (Watson, 2022). By providing shallow drainage, these projects have allowed vegetation to recover, created micro-topography on the marsh platform through placement of the excavated peat, helped restore high marsh habitat for salt marsh dependent species such as the saltmarsh sparrow, and reduced mosquito-breeding habitat.

The short-term goal of this restoration project is to improve the health and function of the salt marsh by restoring hydrology, to allow the marsh platform to revegetate by draining impounded water off the marsh platform, to reduce mosquito breeding habitat, and to reduce the height and vigor of *Phragmites australis*. The long term goals are to restore marsh building processes by increasing belowground biomass which will help stabilize the peat and prevent further marsh platform subsidence and to improve saltmarsh sparrow nesting habitat.

2. Project Activities, Schedule and Work Plan

RIDEM DFW and Save The Bay will finalize the restoration plan (see Figure 3) and review the plan with project partners including the USFWS Coastal Program and the Atlantic Coast Venture Partnership in the winter of 2023. Save The Bay will prepare the permit applications on behalf of the RIDEM Division of Fish and Wildlife for the RIDEM Water Quality Certificate, the CRMC Assent, and the ACOE Pre-Construction Notice under RI General Permit 10. Pre-restoration monitoring in proposed runnels and ditch maintenance areas will occur in the late summer of 2023.

Once permits are received, Save The Bay staff, in coordination with RIDEM DFW and Mosquito Abatement Program will implement the restoration projects - digging runnels and selectively maintaining ditches by hand and with RIDEM's low ground pressure excavator to facilitate drainage of impounded water off the marsh surface. Due to the size of the creeks in the Galilee marsh, the majority of the work will be done by hand since it will not be accessible by the excavator. The first phase of restoration including installation of runnels and ditch remediation will tentatively occur in the mid-fall of 2023 once permits are secured and will continue in the late winter/spring and fall of 2024. The mulching of *Phragmites australis* will be performed where tidal restoration has occurred to better assess the extent of impounded water on the marsh platform and to allow sheet flow in dense stands of *Phragmites.*

Timeline:

April 2023: Finalize restoration plan in coordination with project partners, including RIDEM DFW, RIDEM Mosquito Abatement Coordinator, and USFWS Coastal Program.

May 2023-June 2023: Develop permit applications and submit permit packages to CRMC, RIDEM, and ACOE.

August–Sept. 2023: Establish monitoring transects and conduct pre-restoration monitoring in coordination with RIDEM DFW staff.

Fall 2023–Spring 2024: Once permits are received, conduct the first phase of tidal hydrology restoration including the excavation of runnels and selective ditch maintenance by hand or with the state's low-ground pressure excavator. Mulch the *Phragmites* in the area where tidal hydrology restoration has occurred.

March 2024: Submit an annual report to CRMC.

Spring 2024: Coordinate dig days with community partners including the Salt Ponds Coalition, RIDEM DFW's volunteer coordinator and STB salt marsh stewards.

August–Sept. 2024: Conduct the first year of post-restoration monitoring.

Fall 2024–Spring 2025: Assess the effects of the first phase of drainage enhancement using runnels and selective ditch maintenance based on the site conditions, including impounded water level and condition of unconsolidated sediments. Continue to conduct the 2nd phase of the runnel excavation. Maintain existing runnels from the 1st phase and extend runnels by hand digging.

Fall 2025: Conduct 2nd year of post-restoration monitoring. Submit the final report to CRMC. Share results of monitoring data with project partners, and restoration practitioners through presentations and reports. Save The Bay will continue to monitor and maintain the sites with project partners after the grant period.

3. Minimization of Adverse Impacts

To minimize disturbance to salt marsh species such as the salt marsh sparrow and the willet that nest in the high marsh, work in the salt marsh will occur outside the salt marsh bird nesting season. We will conduct vegetation and water level monitoring at the end of the growing season between August and September and excavation and maintenance of runnels will occur between September and May.

4. Public Support

Save The Bay will collaborate with RIDEM DFW staff to recruit community volunteers to participate in the restoration implementation including the Salt Pond Coalition members and volunteers through RIDEM DFW. We have received a letter of support from the Salt Pond Coalition and will collaborate with their staff to share progress on the restoration project through their newsletter. Save The Bay is also developing a salt marsh steward program to train interested volunteers in assessing salt marshes post-storm events, clearing

debris from runnels, and assisting with the maintenance of runnels. The Galilee marsh will be one of the sites where we recruit dedicated community volunteers to become stewards of the marsh.

5. Economic and Educational Benefits

The economic benefits of restoring salt marsh hydrology include improved habitat for nekton that live in salt marshes and are forage fish for recreationally and commercially valuable species such as striped bass and bluefish. Other economic benefits include improved recreational opportunities for the public, such as fishing and birdwatching. Healthy marshes can also provide some level of protection for infrastructure during coastal storms. Restoration of tidal hydrology will reduce mosquito breeding habitat and future mosquito breeding abatement costs.

There are many educational opportunities associated with this restoration project. Our restoration partner, RIDEM DFW, will highlight this restoration project through their *WILD Rhode Island* quarterly magazine and Save The Bay will highlight the restoration project through our monthly Currents email, Tides Magazine and social media.

Save The Bay will continue to transfer lessons learned from these and other salt marsh restoration projects that have used runnels to restore tidal hydrology with restoration practitioners throughout the region through USFWS' SMART (Salt Marsh Adaptation and Resilience Team). Wenley Ferguson is a member of the SMART Design Review Team and participates in monthly meetings to review projects with restoration practitioners from the region including Maine, New Hampshire, Massachusetts, Connecticut and New York. We also have been continuing to provide technical assistance on projects in the Buzzards Bay and Westport River watersheds in coordination with Bristol County MA Mosquito Control and participate in Connecticut's Salt Marsh Working group and Massachusetts's Salt Marsh Working Group and through regional partnerships including the Atlantic Coast Joint Venture, the Northeastern Mosquito Control Association and the National Park Service's Northeast Coastal Marsh Restoration and Management Series.

6. Climate Change and Coastal Resiliency

Improving the health and function of salt marshes by providing shallow drainage of expanding impounded water areas will allow plants to recolonize the marsh, will stabilize the peat and unconsolidated sediments, and will increase the ability of the salt marsh to keep pace with accelerated sea level rise. The Galilee marsh has limited area for marsh migration but it does have some brackish marsh and undeveloped uplands bordering the salt marsh. Addressing the impounded water at the upper edge of the marsh and reducing the height and vigor of *Phragmites australis* will help facilitate marsh migration as sea level rises. The loss of vegetated marsh threatens the ecological health of salt marshes and the functions and values that they provide for fish and wildlife habitat, carbon sequestration, nutrient cycling and storm buffering.

7. Environmental Justice

Galilee salt marsh lies just east of a neighborhood that is designated Environmental Justice Priority Area-Index 1 (56.7% of population is low-income and 4% is non-white or Latinx). The entire marsh area is publically accessible and the salt marsh to the north of the Escape Road is a popular shellfishing area for a diversity of residents. This site is accessible via a public RIPTA bus line connecting the Providence Metropolitan area to Galilee.

8. Planning Consistency and Restoration Priority

Rhode Island's Coastal Wetland Restoration Strategy (2018) describes the need for salt marsh restoration due to past stressors and accelerated sea level rise. It highlights restoration techniques including drainage enhancement through the use of runnels and tidal hydrology restoration. The State's Wildlife Action Plan (2015) finds salt marshes as highly vulnerable to climate change and the salt marsh sparrow is listed as a Species of Greatest Conservation Need.

USFWS's Northeast region has identified the conservation of the saltmarsh sparrow and its habitat as a regional priority, including the most recent strategic planning document for the Coastal Program (Northeast Region Strategic Plan, 2017-2021). This plan specifically includes the intent to "facilitate projects to restore and enhance salt marsh, particularly high marsh habitat, to improve habitat quality for Saltmarsh Sparrow and other priority species." The Atlantic Coast Joint Venture recently published a Saltmarsh Bird Conservation Plan for the Atlantic Coast (2019) in which they identify saltmarsh sparrow among the highest priority species for conservation. The plan identifies as a priority the implementation of promising management actions including 1) the creation of runnels to improve drainage of ponded areas 2) improving drainage by remediating ditches, trunks and dikes to restore more natural hydrology and 3) creation of micro-topography/mounds to provide nesting areas less prone to flooding. Wenley Ferguson has met with staff from USFWS and the Atlantic Coast Joint Venture to show them examples of these restoration techniques. The plan identifies evaluating these restoration techniques as a priority science need to advance conservation for this species. Through a Natural Resource Conservation Service's Conservation Effects Assessment Project (CEAP) grant, the restoration activities implemented at these sites are being evaluated to help inform the development of best management practices for use at additional sites. Wenley Ferguson is working with Dave Burdick from UNH, who has received funding from NRCS to monitor six restoration projects where STB has conducted tidal restoration through the use of runnels.

9. Species of Concern

Tidal marsh specialists such as the saltmarsh sparrow and other bird species that nest on the marsh such as the willet, *Tringa semipalmata***,** rely on high marsh for nesting areas (i.e. *Spartina patens, Juncus gerardii*). With increased inundation of the marsh platform and loss of high marsh species, the salt marsh sparrow

population has shown a significant decline over an 18 year period -wide according to the SHARP (Salt Marsh Habitat and Avian Research Program). The Saltmarsh Sparrow is listed as globally Vulnerable by the International Union for Conservation of Nature and is being considered for listing as federally endangered by the USFWS.

The creation of high marsh habitat that provides protection for nesting birds during tidal flooding events will directly benefit tidal marsh nesting birds in Rhode Island. Increased inundation of the marsh platform and loss of high marsh species negatively affects salt marsh dependent breeding birds through nest loss due to tidal flooding (Reinert 2006). Tidal marsh specialists such as the American black duck (*Anas rubripes*), clapper rail (*Rallus crepitans*), saltmarsh sparrow, seaside sparrow (*Ammodramus maritimus*), and willet (*Tringa semipalmata*)**,** rely on high marsh for nesting areas (i.e. *Spartina patens, Juncus gerardii*) and all of these avian species have been observed utilizing and/or breeding in the Galilee marsh. The Saltmarsh Sparrow is listed as globally Vulnerable by the International Union for Conservation of Nature and is being considered for listing as federally endangered by the USFWS, and could be extinct within the next 50-years without immediate intervention of coastal habitat restoration (Salt Marsh Habitat and Avian Research Program). Additionally, the Atlantic Coast Joint Venture lists both the American black duck and saltmarsh sparrow as flagship species for conservation efforts and coastal marsh restoration. Clapper rail, seaside sparrow, and willet are all listed as species of concern within Rhode Island. Further, recent surveys (J. Herbert unpublished data) suggest a decline in the statewide population of seaside sparrows, with a more restrictive range than described in (Berry et al. 2015). Seaside sparrows are nesting in the Galilee marsh, which is only one of four sites in the state where breeding was found to occur during the 2022 breeding season (J. Herbert unpublished data). Without immediate conservation efforts geared towards seaside sparrow conservation, this species is at immediate risk of statewide extirpation throughout Rhode Island (J. Herbert pers. comm.).

10. Permitting

Save The Bay will prepare the following permits on behalf of the property owners in consultation with RIDEM's Mosquito Abatement Coordinator:

- Coastal Resources Management Council Assent
- Rhode Island Department of Environmental Management Water Quality Certificate
- General Permit from the Army Corps of Engineers (ACOE). During the permitting process through the ACOE, federal agencies including EPA, USFWS, and NOAA are consulted to ensure that the runnel implementation does not affect endangered species or essential fish habitat.

11. Capacity of Lead Organization (attach additional materials if necessary)

The project will be coordinated and implemented by Ben Gaspar, Restoration Ecologist and Wenley Ferguson, Director of Habitat Restoration. Ben has worked at Save The Bay for the past year and had been a Field Technician for USFWS for nine years. Ben has experience overseeing and monitoring salt restoration projects. Ben and Wenley have collaborated on tidal hydrology restoration projects over the past eight years while Ben was at USFWS. Wenley has been conducting tidal hydrology restoration projects since 1999 and has overseen over twenty tidal hydrology restoration projects using runnels and selective ditch maintenance since 2013. She has experience identifying stakeholders, securing funding, designing projects, developing permit applications, overseeing implementation and conducting pre and post restoration monitoring. Wenley has worked at Save The Bay since 1990 and on habitat restoration projects through RI and the Massachusetts section of the watershed.

V. SUSTAINABILITY (one page maximum)

1. Maintenance

What is the estimated "lifespan" of each planned restoration activity? What are the anticipated short-term and long-term (beyond the funding period) operation and maintenance requirements of the project? Specify who will be responsible for funding and carrying out each O & M activity. Indicate when and with what frequency activities will occur.

Tidal hydrology restoration through the use of runnels and selective ditch maintenance requires ongoing maintenance of the drainage features. Save The Bay will train project partners to assess how the runnels are functioning and to maintain them if they are clogged by sediment, wrack, or vegetation. Save The Bay will request 10-year permits from the permitting agencies since these projects require multiple years of phased runnel installation and maintenance.

2. External Factors

Identify existing external (off-site) factors that could reduce the chances of achieving the project goals (e.g. stormwater inputs to the site from the surrounding drainage area). Explain how these external factors will be addressed. Describe any additional measures taken to help ensure long-term success of the project (e.g. installation of stormwater management practices or securing of conservation easements).What are the likely future effects of climate change and future sea level rise on the proposed project and how will these be addressed?

Stormwater runoff from Sand Hill Cove Road and Roger Wheeler Beach could impact the salt marsh in the southeastern section of the marsh. Save The Bay has discussed potential stormwater infiltration measures with RIDEM Planning and Development that could be implemented to reduce the amount of untreated runoff from discharging directly into the marsh. We will continue work with project partners to address stormwater management to improve marsh health.

The long-term operation and maintenance of the self-regulating tide gates under the Escape Road will affect the amount of water flooding the salt marsh. Save The Bay will continue working with RIDEM DFW and the project partners to develop a long-term management plan of the tide gates to ensure that the tidal period and tidal flushing is sized appropriately to support high marsh species.

VI. EVALUATING PROJECT SUCCESS (one page maximum)

1. Performance Measures

How will the success of the project be measured in relation to the restoration goals set forth in this proposal? List performance measures and how they will be recorded. Include a detailed monitoring plan; if applicable (see below).

The project's success will be measured by monitoring the vegetation response and the change in water level on the marsh surface as described in the monitoring plan below. Additional metrics will include the number of community members involved in the project implementation and maintenance and press or social media about the restoration efforts. The time it will take for the tidal restoration efforts to restore functional salt marsh habitat will depend upon the existing conditions of the marsh.

2. Monitoring Plan

Describe any planned or completed pre- and post-project monitoring activities. For each monitoring activity list the frequency and month/year of start and end date and the parameters measured. List the entity or entities responsible for funding and carrying out each monitoring activity, and describe how results will be

made available to CRMC and the public. If using an established monitoring protocol, please provide references (see CRMC website for information on established monitoring protocols).
Monitoring transects will be established at the Galilee salt marsh restoration to document changes to vegetation communities and water levels over time. Monitoring will be conducted pre- and post-restoration. Save The Bay uses a line point intercept method to monitor vegetation and conducts water level monitoring along each point of the transect. Additionally water level loggers will be deployed pre and post restoration and photo stations will be established at each salt marsh. The presence and absence of mosquito larvae will be assessed pre and post-restoration. Adaptive management techniques will be implemented during subsequent years in direct response to the monitoring data. We will conduct two years of monitoring during this project and will continue to monitor the site for up to five years with funding through Save The Bay and other sources to be secured in future years.

RIDEM DFW has an ongoing monitoring effort for saltmarsh sparrow, seaside sparrow, clapper rail and willet at the Galilee marsh. We will coordinate our restoration efforts with RIDEM DFW's monitoring data of nest placement and nest success.

References:
Adamowicz, S.C., G. Wilson, D.M. Burdick, W. Ferguson, and R. Hopping. 2020. Farmers in the marsh: Lessons from history and case studies for the future. *Wetland Science & Practice* 183–195.

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Reinert, S. E. (2006). Avian nesting response to tidal-marsh flooding: literature review and a case for adaptation in the Red-winged Blackbird. *Studies in Avian Biology*, *32*, 77.

Watson, E., W. Ferguson, L. Champlin, J. White, N. Ernst, H. Sylla, B. Wilburn, C. Wigand. 2022. Runnels Mitigate Marsh Drowning in Micro-Tidal Marsh. *Frontiers in Environmental Science*. https://www.frontiersin.org/articles/10.3389/fenvs.2022.987246/full

VII. PROJECT BUDGET TEMPLATE

BUDGET CATEGORY	CRMC REQUEST	MATCH	MATCH PENDING OR SECURED? (select one)	SOURCE OF MATCH	TOTAL
Save The Bay staff time monitoring/implementation, mileage and overhead @ 10%	25,840	7,962	Secured	Narragansett Bay Estuary Program grant	33,802
RIDEM low ground pressure excavator rental	8,000				8,000
Excavator operator and excavator transportation	6,660				6,660
RIDEM DFW staff		12,979		RIDEM staff time	12,979
RIDEM Mosquito Abatement Coordinator		1,120	Secured	RIDEM staff time	1,120
Save The Bay interns and community volunteers		3,474	secured	Volunteer/intern time	3,474
TOTAL	**40,500**	**25,535**		**TOTAL PROJECT COST**	**66,035**

VIII. BUDGET NARRATIVE (one page maximum)

Please provide a description and justification for each line item included in the project budget form (e.g. for personnel costs, provide hourly and fringe rates, for travel specify rate and estimated number of miles). Please specify any match requirements for each source of funding. Please include costs associated with required annual and final reports to CRMC. Be sure to detail how CRMC funds will be used.

Save The Bay Staff, Mileage & Overhead: Wenley Ferguson, Save The Bay's Director of Restoration, will spend 116 hours at $51.94/hour and Ben Gasper, Restoration Ecologist, will spend 320 hours at 47.51/hour on the implementation and monitoring phase of the project. Save The Bay hourly rates include a 27% fringe benefit rate. Additional expenses Save The Bay will include mileage will equal $930 at $0.47/mile and use 10% overhead rate on the project expenses.
Staff time to support the plan development, RTK surveying for the self-regulating tide gate modeling and permitting will act as match for the grant (Ben Gaspar at 102 hours and Wenley Ferguson at 60 hours). Funding for Save The Bay's staff time is provided by a Capacity Building Grant from the Narragansett Bay Estuary Program.

RIDEM Mosquito Abatement Program's excavator: RIDEM's low ground pressure excavator will be rented for 8 days at $1,000 per day.

Excavator Operator: An excavator operator will be hired by Save The Bay for 8 days of operation at $75/hour.

Excavator Transportation: A hired contractor will transport the excavator from URI's East Farm where RIDEM's Mosquito Abatement Program is located to Galilee marsh (2 trips at 3 hours $105/hour for truck, trailer and driver).

RIDEM Mosquito Abatement Coordinator (16 hours): Al Gettman, RIDEM's Mosquito Abatement Coordinator will dedicate 16 hours at $70/hour for mosquito breeding assessment, design review and construction coordination associated with the use of the low ground pressure excavator.

RIDEM Division of Fish and Wildlife's Biologist, John Veale will spend 140 hours at $54.08/hour for plan review, review of permit applications, elevation surveys, project implementation of drainage enhancement. John Herbert, RIDEM's Non-game Threatened and Endangered Species Biologist will dedicate 100 hours at 54.08/hour for plan review and conducting avian monitoring pre-and post-restoration monitoring.

Save The Bay volunteers and interns will spend 116 hours at $29.95/hour assisting with monitoring and hand digging runnels.

IX. ADDITIONAL MATERIALS

Please include the following with your application:

_X_ Site and Locus Maps

_X_ Ground-level photographs of existing site conditions

_X_ Aerial photographs, if available

_X_ Preliminary design drawings, maps or engineering plans, if available

___ Pertinent physical, ecological, biological, and cultural / historical survey data

_X_ Letters of support

Figure 1: Project Location & Coordinates: RIDEM parcel map of Galilee salt marsh: -71.501929, 41.378288

Figure 2: Existing Conditions Photos

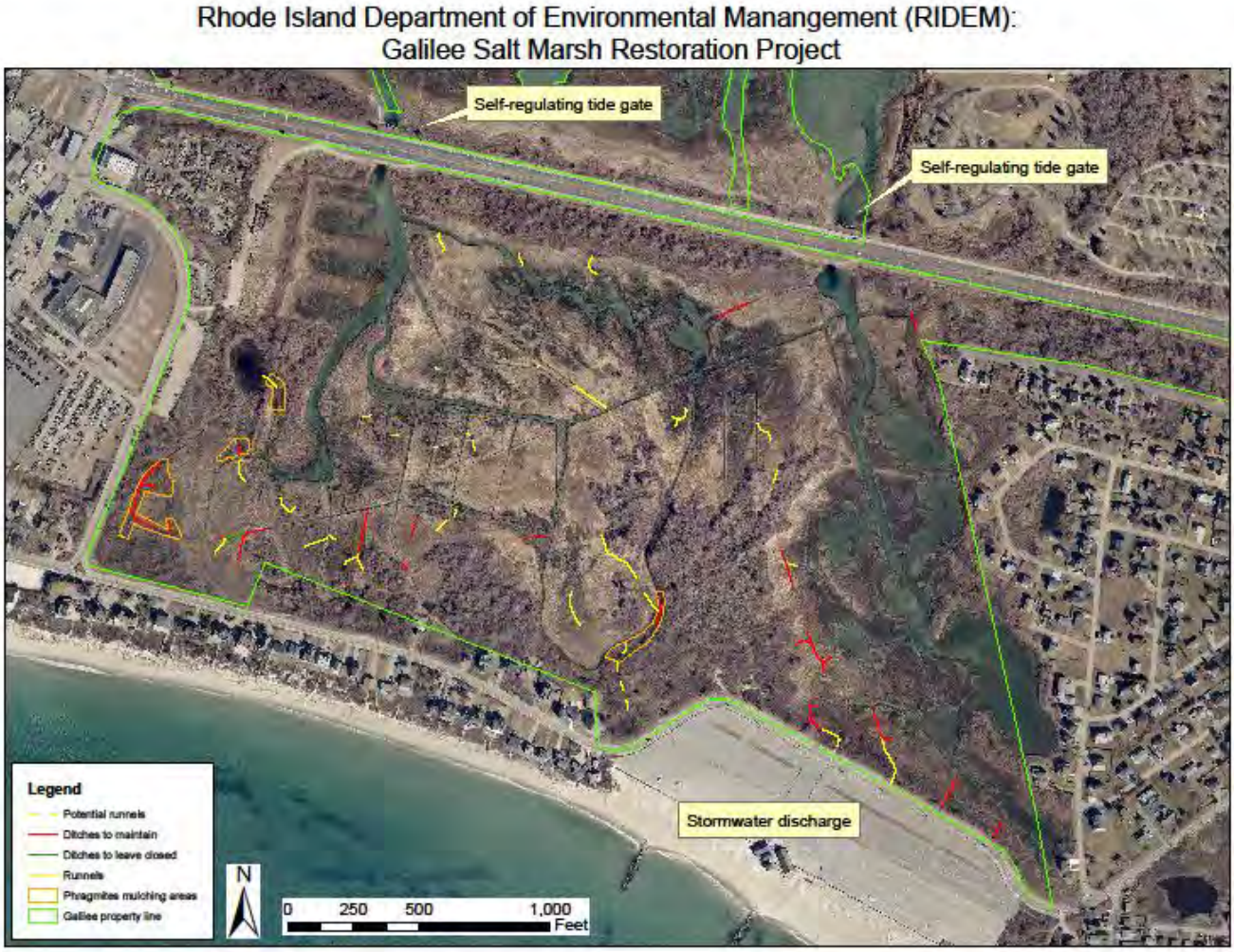
Impounded water on marsh platform from ditch spoils in foreground and embankment in background.

Agricultural embankment and associated borrow ditch covered in algal mat

Stormwater discharge from Roger Wheeler State Beach culvert along Sand Hill Cove Road

Stormwater discharge observed runoff along Sand Hill Cove Road

Figure 3: Salt Marsh Restoration Plan



Draft salt marsh restoration plan showing proposed runnels to be installed, drainage features to be maintained and Phragmites to be mulched.

THE UNIVERSITY OF RHODE ISLAND
COLLEGE OF THE ENVIRONMENT AND LIFE SCIENCES

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http://web.uri.edu/cels-gradprograms/mesm/

Dear CRMC Trust Fund Committee Members:

I am writing in strong support of the project, "Restoration of Legacy Agricultural and Mosquito Abatement Impacts to Galilee Salt Marsh" proposed by Wenley Ferguson of the Save the Bay and supported by RI DEM. The salt marsh at Galilee provides critical habitat for Saltmarsh Sparrows, a species in steep decline, and a species that desperately needs habitat restoration efforts to provide key nesting habitat. My students and I worked in Galilee in over 20 years ago and found the marsh provided key nesting habitat for Saltmarsh Sparrows (see DiQuinzio et al. 2002. Nesting ecology of Saltmarsh Sharp-tailed Sparrows in a tidally restricted salt marsh. Wetlands; DiQuinzio et al. 2001, Site fidelity, philopatry, and survival of promiscuous Saltmarsh Sharp-tailed Sparrows in Rhode Island Auk). This 100 acre salt marsh was the site of one of the earliest and most extensive salt marsh restoration projects in New England (see Golet et al. 2012 chapter in Tidal Marsh Restoration). The plan proposed by Wenley Ferguson and others to construct runnels throughout the marsh to restore tidal hydrology is needed to provide critical nesting habitat for Saltmarsh Sparrows. This strategy has been used effectively to modify tidal hydrology in other salt marshes in New England (see Perry et al. 2022. Salt marsh climate change adaptation: Using runnels to adapt to accelerating sea level rise within a drowning New England salt marsh. Restoration Ecology 30:e13466.). There are limited data on the effects of runnels on Saltmarsh Sparrows, thus this is the ideal opportunity to assess the effectiveness of this restoration strategy. I think this will be a good investment in your limited funds, as this team has a proven track record.

Sincerely

Peter Paton,
Professor and Chair

Digitally signed by Peter Paton, Professor and Chair
Date: 2023.01.18 13:26:29 -05'00'

Peter Paton
Professor and Chair
Department of Natural Resources Science
Univ of Rhode Island
Kingston RI 02881

Salt Ponds Coalition
50 Bend Road, P.O. Box 875
Charlestown, RI 02813
(401)-322-3068
saltpondscoalition.org

Caitlin Chaffee
Reserve Manager, Narragansett Bay National Estuarine Research Reserve
RI Dept. of Environmental Management
235 Promenade Street
Providence, RI 02908

January 17, 2023

Dear Caitlin,

This letter is in regards to the Save the Bay application for funds from the Rhode Island Coastal and Estuary Habitat Restoration Fund for the Restoration of Legacy Agricultural and Mosquito Abatement Impacts to the Galillee Salt Marsh Project. The Salt Ponds Coalition is the official watershed council of the salt ponds, and we support this project as it will further enhance the resiliency of the marsh adjacent to Point Judith Pond. SPC would like to offer its support for this project, not only in this letter, but also in any way needed to see this work done on the marsh.

Galillee Salt Marsh is important to the health of Point Judith Pond, and serves as an important nesting ground for salt marsh sparrows. The salt marsh also serves as a natural storm barrier for the community of this area. Draining impounded water away from the salt marsh and placing excavated peat on the salt marsh platform will reduce subsidence.

SPC recognizes the vital role that salt marshes play in the health of the salt ponds, and that salt marshes are quickly disappearing. We are currently working to protect and revitalize another Point Judith Pond salt marsh ecosystem that lies in the northeast corner of the Pond near Harbour Island.

This grant would allow for vital work to maintain this salt marsh and improve overall habitat quality in this pond.

Yours for a better environment,

Art Ganz

Arthur R. Ganz, M.S.
Salt Ponds Coalition President

AUTHORIZED SIGNATURE

AUTHORIZED AGENT OF LEAD ORGANIZATION

Wesley Ferguson

1/26/2023

Signature **Date**

Return your completed proposal by 4:00 p.m. on **January 27, 2023** to:

Caitlin Chaffee
NBNERR
RI Dept. of Environmental Management
235 Promenade Street
Providence, RI 02908

caitlin.chaffee@dem.ri.gov

Applicants are required to submit one (1) signed hard copy of the proposal form and one (1) electronic copy in Adobe PDF format. **Please submit electronic copy as a **SINGLE PDF FILE** containing all application materials.**

Contact Caitlin Chaffee at **401-222-4700 ext. 277-4417** with any questions.

CRMC
COASTAL RESOURCES MANAGEMENT COUNCIL

Rhode Island Coastal and Estuary Habitat Restoration Fund
Full Proposal Form 2022/2023

****for planning projects please use Full Proposal Form for Planning Projects**

I. PROJECT SUMMARY

1. **Project Title:** Woonasquatucket In-Water and Bank Habitat Improvement Below Manton Dam

2. **Project Location and coordinates** *(include map)*: Woonasquatucket River and Greenway from 1 Goldsmith Street in Johnston to corner of Greenville & Hillside Avenue in Johnston (see attached NRCS Conservation Plan map), 41.83814379942131, -71.47441445922352

3. **Project type** *(Design, Construction or Other)*: Construction

4. **If other, please specify:**

5. **Habitat type** *(River System, Salt Marsh, Seagrass, Shellfish Bed, other)*: River System

6. **If other, please specify**: N/A

7. **Restoration technique** *(e.g. re-vegetation, tidal restoration, etc.)***:** In-stream and bank stabilization, buffer restoration, stabilization and re-vegetation

8. **Total acreage or miles(river systems) of habitat to be restored, or project area planning unit size:** 6.5 Acres

9. **Project benefits:** 1) Streambank stabilization, 2) Assurance of passage of migratory fish to Manton Dam Nature-Like Fishway, 3) Improved streambank wildlife habitat, 4) Prevent slumping of Woonasquatucket River Greenway into river

10. **Project partners** *(organizations providing financial or other support to the project)***:** USDA Natural Resources Conservation Service (NRCS)

11. **Is this is an ongoing project that has previously received funds from the CRMC Coastal and Estuarine Habitat Restoration Fund?** Yes **If yes, year(s) funding was awarded:** This is a new project but it supports a project that was supported by the CRMC Coastal and Estuarine Habitat Restoration Fund – The Manton Pond Dam Nature-Like Fishway

- 2009 – $29,200 (Design)
- 2010 – $9,000 (Design)
- 2013 – $56,401 (Construction)
- 2014 – 62,523 (Construction)
- 2016 – $110,873 (Construction)
- 2021 – $58,000 (Permitting & Construction Oversight)

II. PROJECT MANAGER CONTACT INFORMATION

1. **Name:** Alicia J. Lehrer, Executive Director
2. **Organization:** Woonasquatucket River Watershed Council
3. **Address:** 45 Eagle Street, Suite 202
4. **City:** Providence **5. State:** RI **6. Zip:** 02909
7. **Phone:** 401-861-9046 **8. Email:** alehrer@wrwc.org
9. **Property Owner(s):** Kenneth Bent, Preferred Equipment Resource

Applicant must document ownership of project site or permission to perform all proposed restoration, maintenance and monitoring activities *(include appropriate documentation).*

III. BUDGET SUMMARY

(List individuals or organizations providing financial or in-kind support to the project under Project Partners)

	Amount Requested from Trust Fund	**$50,000**
Matching Funds	**Project Partner(s)**	**Amount of Match**
Cash	USDA Natural Resources Conservation Service (NRCS) EQIP	$401,660
Cash	US Fish & Wildlife Service (USFWS)	$80,000
Cash	Rhode Island Coastal and Estuary Habitat Restoration Fund	$50,000
Cash	Additional funding from USDA NRCS & other sources (pending and still needed)	$314,340
	TOTAL PROJECT COST	$896,000

IV. PROPOSAL NARRATIVE (five pages maximum)

1. Justification and Purpose

Prolific damming of the Woonasquatucket River, mostly to power textile mills, has greatly hampered diadromous fish passage on this river for more than 150 years. Thanks to the vision of many local, state and federal partners, the potential for diadromous fish habitat on the Woonasquatucket has gone from a dream to reality. This is a summary of fish passage accomplishments to date on the Woonasquatucket:

1. Rising Sun Mills (the first dam on the Woonasquatucket): Denil Fish Ladder construction completed in 2008
2. Paragon Mills (second dam): Partial breach completed in September 2010
3. Atlantic Mills (third dam): Denil Fish Ladder construction completed May 2009
4. Dyerville Mills (fourth dam): Removed October 2009
5. Manton Pond Dam (fifth and final dam on the lower Woonasquatucket): Nature-Like Fishway completed December 2016

The Rhode Island Coastal and Estuary Habitat Restoration Fund has played a vital role in all of these projects, sharing in the vision of restoring the lower Woonasquatucket as spawning habitat for 40,000 breeding river herring (blueback herring and alewife) and possibly American shad, and opening passage for American eel and resident river species. This restoration has been largely successful as shown in the chart below of annual herring return counts completed by WRWC volunteers:

Year	River Herring Count	DEM Stocked Spawning River Herring in Woony this Year	Important Notes
2008	No Count	X	Rising Sun Denil Fishway Open June 2008 (DAM 1)
2009	No Count		Dyerville Dam Removed October 2009 (DAM 4) Atlantic Mills (Riverside Park) Denil Fishway Open December 2009 (DAM 3)
2010	25,618		Paragon Dam Partial Breach September 2010 (DAM 2) Note: This count probably inaccurate as it likely reflects herring coming through the Rising Sun Fishway, bumping into Paragon dam, and looping back through the Rising Sun perhaps multiple times
2011	7,269	X	
2012	9,264		
2013	12,336	X	
2014	39,518	X	
2015	20,448	X	
2016	8,674		Manton Pond Dam Nature Like Fishway Completed December 2016 (DAM 5)
2017	19,795	X	
2018	9,103	X	
2019	5,947	X	
2020	20,248		

The riverbank and river between Hillside Avenue and the Manton Pond Dam Nature-Like Fishway have encountered erosion from powerful storms that could compromise diadromous fish access to the fishway. This has resulted in downed trees blocking the river and a culvert breaking and falling into the river. If it continues, it will threaten all streambank habitat in the area and undermine the Woonasquatucket River Greenway, a multi-use trail that allows public access and enjoyment of the river.

The WRWC in partnership with the NRCS proposes to improve in-stream and streambank habitat through an in-stream and bank stabilization program for which designs are nearing completion. Bank stabilization will include native plantings and revegetation that will provide significantly improved habitat for small mammals, birds and pollinators in addition to protecting the fishway. In partnership with the USFWS for which USFWS is providing matching funds, we will also improve habitat through planting directly around the fishway, and build and program an outdoor classroom at the fishway.

2. Project Activities, Schedule and Work Plan

The WRWC has completed engineering, design and permitting for this project. Thanks to previous CRMC Coastal and Estuary Habitat Restoration Trust (CEHRT) funds, we also have completed bid development and have funds in place for construction oversight. Unfortunately, due to skyrocketing construction costs, our existing match for construction through NRCS and the USFWS, originally estimated at about $500,000 is now completely inadequate based on the current construction estimate for this project: $822,000.

The attached "Final Woonasquatucket Planset," "Final Woonasquatucket Restoration Specs" (Bidding Documents), and "Woonasquatucket Cost Estimate – 100%," all dated December 2022, show that this project is fully designed and ready to construct.

While we are fully prepared to begin bidding and construction immediately, the recent increase in costs will delay bidding and construction until the entirety of funds are in place. While we seek additional funds from CEHRT for 2023 to help fill some of the gap in meeting estimated construction costs, we are also working with our partners at USFWS and NRCS to determine whether there are other avenues for funding through those agencies given the influx of BIL funds nationally. We have meetings on the calendar in early February, 2023 with NRCS and consultants for the National Coastal Resilience Fund to discuss opportunities to apply for the additional $314,340 required to construct the project using current estimates.

WRWC will keep CEHRT apprised of our progress and updated timeline as we secure all the matching funds needed to complete the project.

3. Minimization of Adverse Impacts

The project site is urban and fairly disturbed. The project will entail very little in the way of disturbing existing sensitive species because there has been so much disturbance so frequently that sensitive species have not been able to establish recently. The fairly steep slope has suffered a great deal of erosion already and provides little habitat now. Although we will clear part of the banks, we will revegetate with the aim of providing additional mammal bird and pollinator habitat. We will stabilize the soil with physical measures including soil erosion blankets and stakes.

4. Public Support

The landowner of the project site is Preferred Equipment Resource. Ken Bent is the owner. The WRWC has been in regular communication with Mr. Bent since planning for the Manton Dam Pond Nature Like Fishway began in 2009. Mr. Bent continues to be supportive of improving habitat on his property and assuring continued passage to the fishway. See attached property ownership map and his signed statement of control to use the land.

In addition to landowner support, as part of the Final Restoration Plan led by the USFWS regarding the Centredale Manor Superfund Site (see attached), the conclusion after assessing several restoration alternative was, "After consultation with the other Federal agencies, the State of Rhode Island, and local nongovernment organizations, the Service proposes to implement Alternative 3: Manton Fish Ladder Area Improvements using the Centredale Manor Superfund Site natural resource damage assessment settlement funds." In other words, many organizations and local agencies were asked to weigh in on possible projects and there was overwhelming support for this project.

5. Economic and Educational Benefits

In order to assure effectiveness of the nature-like fishway at Manton Dam, river and bank stabiliziation is a critical step in the Lower Woonasquatucket Fish Passage Restoration initiative. The fishway itself provides unique educational opportunities for families living in Olneyville and draws more people to the

Woonasquatucket to connect to the River and the amazing ecosystem it supports. Improving the habitat surrounding the fishway and constructing an outdoor classroom there will enhance existing educational opportunities. Increasing public awareness of the River as a wildlife corridor will expand a sense of community stewardship and pride.

The WRWC regularly hosts educational bike rides and student classes along the Greenway for hundreds of people annually. One of the students in our high school education program designed the informational signage at the Manton Dam Nature Like Fishway as a final project for our Environmental Leaders program. The new outdoor classroom at Manton Dam will create the opportunity to include more students and adults in both North Providence and Johnston in river and habitat education closer to home. WRWC has already developed a partnership with Kids Klub, a program that serves youth during out of school time in North Providence and Johnston, where WRWC provides "Fun with Fish" programming building on our popular in-school "Fish in the Classroom" program.

Our summer recreational and educational programs for youth incorporate fish passage and watershed habitat education. Between our Bike Camp Campers and our Providence After School Alliance after school programs, we teach over 150 youth about fish passage every year.

While during the COVID-19 pandemic it is not possible to deliver the amount of in-person programming that WRWC usually offers, we look forward to safer times when we can maximize the educational opportunities of additional habitat restoration and outdoor classroom space at Manton Dam. We would expect to educate an additional 200 youth and adults in a typical year using these improved resources as a classroom.

6. Climate Change and Coastal Resiliency

This project will have direct impacts on resilience of habitat to climate change. It will improve streambank habitat resilience to increased storm flows and protect migratory fish spawning habitat that can make up for a other coastal habitat losses due to climate change.

We considered the present and future impacts of climate change during the project planning and design phases. As a result, the project is designed to withstand stronger and more frequesnt storms and rainfall amounts. It is also designed to improve avian, mammal and pollinator habitat along this stretch of the Woonasqatucket River.

7. Environmental Justice

This project locale itself is not an environmental justice community, the project will directly benefit an environmental justice (EJ) community. The proposed project takes place along the Woonasquatucket River and its Greenway in Johnston, just north of the Providence line. This is not an area identified by the Narragansett Bay Estuary Program (NBEP) as an EJ priority area. However, the River and Greenway connect directly within one to an NBEP Priority Environmental Justice Area Index 4 – 94.9% non-white and/or Latinx, 47.3% low income, 41.5% limited English, 47.1% less than high school education level. This is important because the population that will be using the outdoor classroom space and section of Greenway will come, in a large part, from this Priority 4 community. In addition, the erosion control and bank stabilization meaures will most affect the population living downstream of the site, particularly in the neighborhood of Olneyville, and EJ Priority Index 4 community that is also one of the most impacted communities in RI for climate-related flooding.

8. Planning Consistency and Restoration Priority

This project is consistent with the state estuary and coastal habitat restoration strategy, the department of environmental management regulations, and the anadromous fish restoration plan. It is also consistent with he locally-driven Watershed Action Plan developed for the Woonasquatucket where stakeholders identified the development of strategies to "Protect and restore natural habitats including riparian buffers, wetlands and anadramous fish runs throughout the watershed" as a priority.

9. Species of Concern

The project will help assure the success of fish runs which can lead to an increase in breeding populations of birds on the Woonasquatucket. Some of the species of concern listed in the above report, such as black crowned night heron and the hooded merganser are already observed on the Woonasquatucket.

10. Permitting

All permits for this project have been secured (attached):

- ✓ Rhode Island Department of Environmental Management (RIDEM) Water Quality Certification
- ✓ U.S. Army Corps of Engineers (USACE) permit
- ✓ RIDEM Permit to Alter Freshwater Wetlands

11. Capacity of Lead Organization (attach additional materials if necessary)

The Woonasquatucket River Watershed Council, a 501(c)(3) organization is working to restore the Woonasquatucket as a natural, recreational, cultural, and economic resource for Rhode Island. The WRWC is actively involved and plays a critical role in ongoing restoration efforts in the watershed including the initiative to restore fish runs to Woonasquatucket; restore the Centredale Manor Superfund site; wetland restoration efforts such as the Deerfield Park and Department of Public Works projects in Smithfield; and riparian buffer restoration projects such as those we successfully completed at Cutler Brook in Glocester, and the Stillwater Brook in Smithfield. The WRWC brings local knowledge and the ability to coordinate funding and partners to facilitate project success.

The WRWC has a long history of coordinating project partners on successful fish passage projects. To date, we have successfully completed five fish passage projects as described in the "Justification and Purpose" section above. See attached resume of Alicia Lehrer, WRWC's Executive Director.

V. SUSTAINABILITY (one page maximum)

1. Maintenance

The lifespan of the riverbank toe restructuring is at least 20 years. The streambank stabilization and improvements around Manton Dam including the outdoor classroom will be indefinite as long as regular maintenance takes place.

There will be few maintenance requirements for the hard armoring of the toe of the streambank. This is why the team selected this option. However, the WRWC River Rangers will inspect the entire project at least monthly during the growing season every year for at least three years following construction.

Maintenance funds are built into WRWC's USFWS restoration grant. Monthly maintenance for three years will include the following:

- Inspection of all elements of the projects
- Trash removal
- Invasive removal
- Watering
- Replacing vegetation if/when necessary
- Communicating with RIDOT if any issues arise that will affect the multi-use trail

As the state designated steward of the Woonasquatucket River Watershed and the Woonasquatucket Greenway, WRWC is committed to long-term maintenance of all our projects. We continually pursue opportunities for long-term maintenance funding and employ a full-time maintenance crew to care for all of our projects and resources. We are currently learning to use GIS-based maintenance application that will help us track projects, their specifications for function and operation, and regular maintenance activities so that as our team grows and changes, we have seamless transfer of effective maintenance.

2. External Factors

Climate change is already causing increased frequency and intensity of storms that have led to the issues we are addressing with this project, especially, the destabilization and slumping of the streambank into the river. For that reason, although it is not the most preferable option for restoring wildlife habitat, we selected the harder streambank toe riprap armoring option, which is designed to withstand even the most intense storms. The vegetated upper areas of streambank will need ongoing maintenance as described above and extremely intense storms could compromise that part of the project. We know that this is the case and therefore, our plan for ongoing maintenance will assure project success over the long term.

Sea level rise is not expected to affect this project as sea level rise should not affect any areas upstream of Rising Sun Mills on the Woonasquatucket.

VI. EVALUATING PROJECT SUCCESS (one page maximum)

1. Performance Measures

Success of this project will be measured through annual monitoring of fish return through the fish ladder at Rising Sun Mills (see monitoring plan below). WRWC volunteers, under the supervision of RIDEM F&W, monitor annual migratory fish return to the Woonasquatucket at the first fish ladder, Rising Sun Mills. Over 40 volunteers participate in monitoring annually. The WRWC, in partnership with RIDEM F&W, train volunteers in monitoring fish return and recording data.

Additionally, as this project has an educational component as well as a restoration component, WRWC will track the number of youth and adults, especially from Johnston and North Providence, that join WRWC educational programs using the outdoor classroom and tours of the restored riverbank.

2. Monitoring Plan

WRWC volunteers monitor fish return annually at the Rising Sun Mills Fish Ladder using RIDEM F&W monitoring protocol.

Volunteers collect direct counts at least twice daily from the middle of March through the middle of May annually. They record data in a notebook stored in a lockbox at the site. The data are analyzed by RIDEM F&W. The WRWC reports results through our Constant Contact email list, on our website, in our newsletter and directly to project partners.

Since 2010, over 40 volunteers have collected fish return data at Rising Sun Mills annually. The WRWC will assure that this practice continues in perpetuity by coordinating with RIDEM F&W, recruiting, training and setting up a monitoring calendar annually. As more habitat becomes available, we expect to see an increase in fish return at Rising Sun annually.

Additionally, the WRWC began a new volunteer monitoring program in 2014 that we continue annually. Volunteers collect fish community data annually through an electrofishing program at two sites on the Woonasquatucket. The upstream site is located on a section of river next to Whipple Field in Smithfield, a site we consider to be a fairly pristine riverine site. The second site is just downstream of Rising Sun Mills Dam in Providence, our urban site. Volunteers inventory the fish community once annually at each site on a 100' stretch of the river. This program allows us to establish a baseline and monitor changes in the fish community. We expect that our fish passage projects will strengthen the fish community diversity and population at our downstream site because all river fish will have a greater habitat range as a result of our fish passage projects. Our protocol for this program was developed with the assistance of Alan Libby, state Fishery Biologist.

Finally, as three years of maintenance funding is part of the USFWS grant, the Woonasquatucket River Rangers will be able to monitor the bank stabilization and the establishment of the vegetation installed to improve habitat during that time. Maintenance funds include monthly inspections during the growing season for three years as well as invasive removal and plant replacement if necessary. Should the bank stabilization show signs of failing, the WRWC team will work with partners to correct any issues expediently.

VII. PROJECT BUDGET TEMPLATE

BUDGET CATEGORY	CRMC REQUEST	MATCH	MATCH PENDING OR SECURED? (select one)	SOURCE OF MATCH	TOTAL
Bidding & Contractor Selection	$0	$3,000 $2,000	SECURED PENDING	CRMC CEHRT NRCS, NCRF, Other Sources	$5,000
Construction Administration & Oversight	$0	$39,520	SECURED	CRMC CEHRT	$39,520
Construction	$45,000	$464,660 $312,340	SECURED PENDING	USFWS - $63,000 NRCS - $401,660 CEHRT, NRCS, NCRF	$822,000
3 Year Maintenance	$0	$12,000	SECURED	USFWS	$12,000
Educational Programming	$0	$5,000	SECURED	USFWS	$5,000
Project Management	$5,000	$7,480	SECURED	CRMC CEHRT	$12,480
TOTAL	**$50,000**	**$846,000**		**TOTAL PROJECT COST**	**$896,000**

VIII. BUDGET NARRATIVE (one page maximum)

Bidding & Contractor Selection: Funding for this task is being used as match from previous CRMC funding and other sources. The WRWC solicited a cost proposal from EA for this item as WRWC would prefer to use the design engineers for managing the bidding and contractor selection process for the project since they best understand the project requirements. $5,000 will cover EA's staff labor costs, travel, subs and mark-up to complete all aspects of this item. EA's cost proposal is available upon request.

Construction Administration & Oversight: Funding for this task is being used as match from previous CRMC funding. The WRWC solicited a cost proposal from EA for this item as WRWC would prefer to use the design engineers for construction administration and oversight for the project since they best understand the construction specs and can quickly help the contractor adapt should any changes be required during the construction process. $39,520 will cover EA's staff labor costs, travel, subs and mark-up to complete all aspects of this item. EA's cost proposal is available upon request.

***Construction:** Part of this task is being matched by previous CRMC funding and other sources. WRWC's contractor will construct the project. An engineer's construction cost estimate is attached and reflects a cost of $822,000.

3 Year Maintenance: This task is being used as match from previous USFWS funding. This item includes two (2) WRWC River Rangers over 3 years at an average of two hours a week for 29 weeks/yr during the growing season.

- Two (2) WRWC River Rangers, $30/hour x 200 hours x 2 rangers = $12,000

Educational Programming: This task is being used as match from previous USFWS funding. This item includes time to develop curriculum, coordinate with schools and host programs.

- WRWC Education Director, 142.8 hours @ $35/hour = $5,000

***Project Management:** Part of this task is being matched by previous CRMC funding. This item includes project oversight and annual and final reports to CRMC.

- WRWC Civil Engineer, 80 hours @ $75/hour = $6,000
- WRWC Director of Projects Time, 60.5 hours @ $65/hour = $3,930
- WRWC Executive Director Time, 30 hours @ $85/hr = $2,550

*CRMC funds will be used for these items.

IX. ADDITIONAL MATERIALS

Please include the following with your application:

_X_ Site and Locus Maps

_X_ Ground-level photographs of existing site conditions (see attached Technical Memorandum dated May 18, 2020)

_X_ Aerial photographs, if available

_X_ Preliminary design drawings, maps or engineering plans, if available

___ Pertinent physical, ecological, biological, and cultural / historical survey data (not available at this time)

_X_ Letters of support (see RIACD Letter)

AUTHORIZED SIGNATURE

AUTHORIZED AGENT OF LEAD ORGANIZATION

Alicia J. Lehrer _____ January 27, 2023

Signature **Date**

Return your completed proposal by 4:00 p.m. on **January 27, 2023** to:

Caitlin Chaffee
NBNERR
RI Dept. of Environmental Management
235 Promenade Street
Providence, RI 02908

caitlin.chaffee@dem.ri.gov

Applicants are required to submit one (1) signed hard copy of the proposal form and one (1) electronic copy in Adobe PDF format. **Please submit electronic copy as a **SINGLE PDF FILE** containing all application materials.**

Contact Caitlin Chaffee at **401-222-4700 xt. 277-4417** with any questions.

CRMC
COASTAL RESOURCES MANAGEMENT COUNCIL

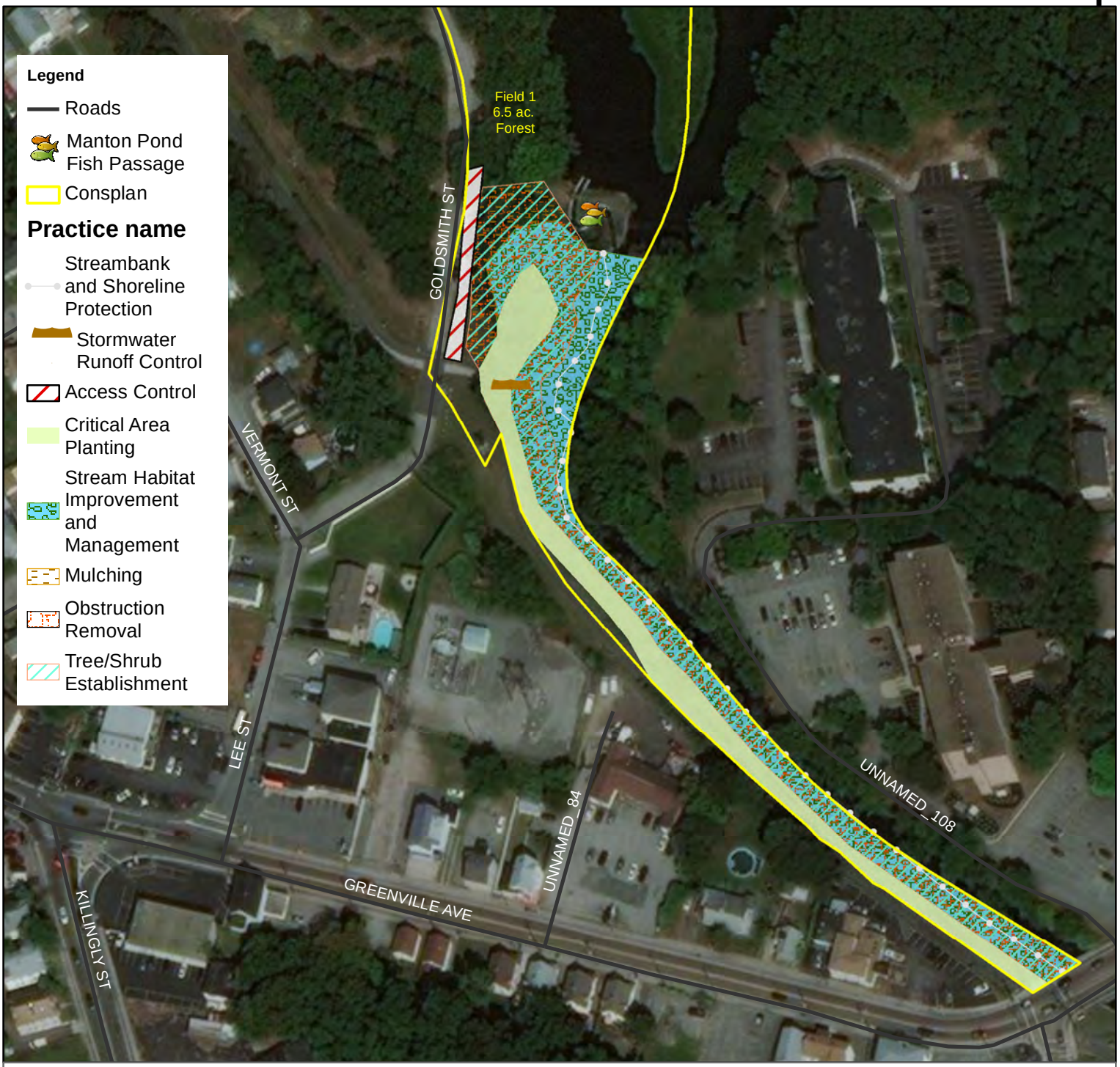
United States Department of Agriculture

Natural Resources Conservation Service
Warwick Field Office, 60 Quaker Lane, Suite 46, Warwick, RI 02886

WOONASQUATUCKET RIVER WATERSHED COUNCIL

Location: 1 Goldsmith St. Johnston, RI 02919

Conservation Plan Map



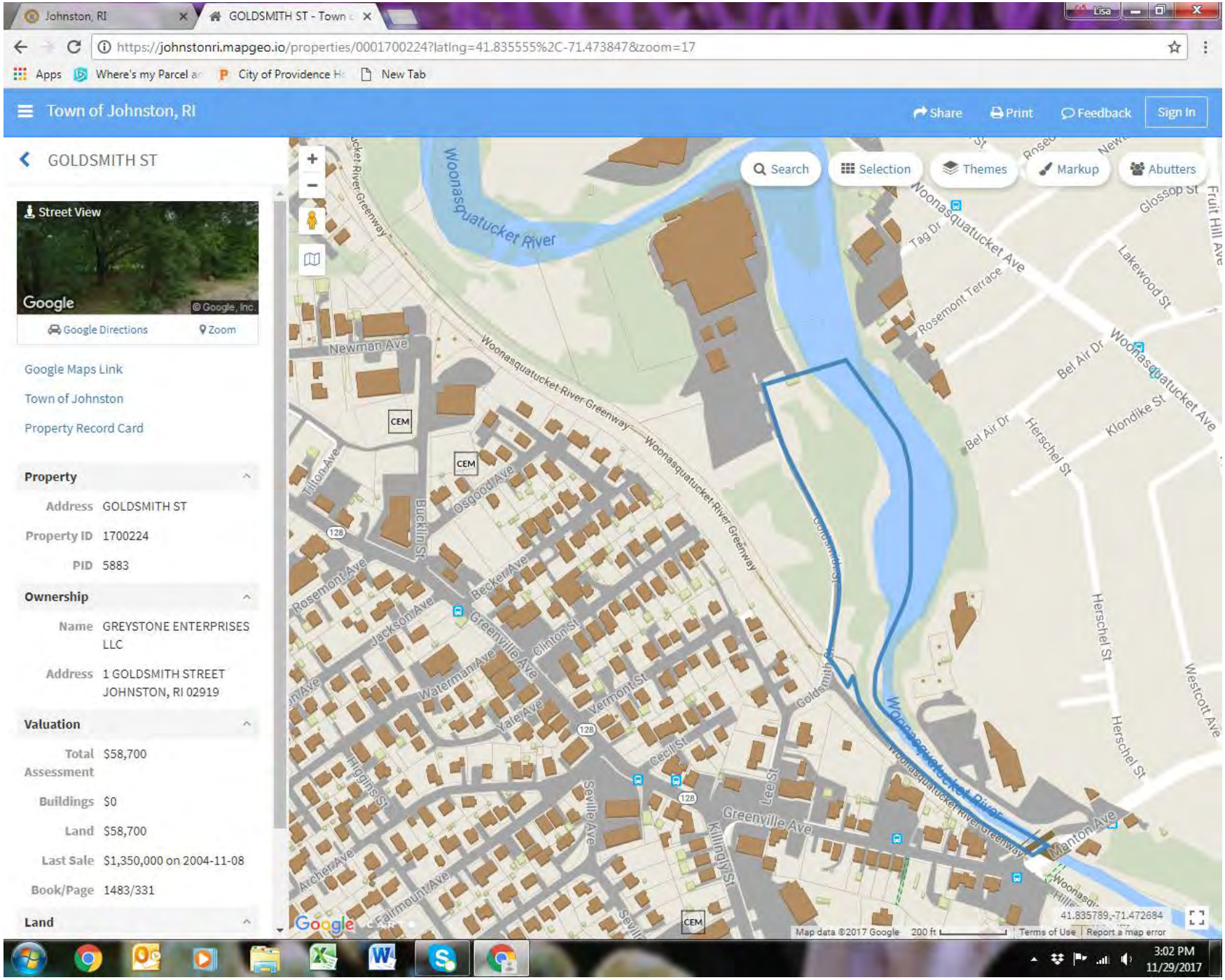
Farm: 634
Tract: 685
County:Providence
Approx. Acres: 6.5

0 55 110 220 Feet

N

Assisted By: Cassius.Spears
Date Printed: 9/5/2018

Data Source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Prepared with assistance from USDA - NRCS


Johnston, RI
GOLDSMITH ST - Town
https://johnstonri.mapgeo.io/properties/0001700224?latlng=41.835555%2C-71.473847&zoom=17
Apps
Where's my Parcel
City of Providence
New Tab
Town of Johnston, RI
Share
Print
Feedback
Sign In
GOLDSMITH ST
Street View
Google
© Google, Inc.
Google Directions
Zoom
Google Maps Link
Town of Johnston
Property Record Card
Property
Address GOLDSMITH ST
Property ID 1700224
PID 5883
Ownership
Name GREYSTONE ENTERPRISES LLC
Address 1 GOLDSMITH STREET JOHNSTON, RI 02919
Valuation
Total Assessment $58,700
Buildings $0
Land $58,700
Last Sale $1,350,000 on 2004-11-08
Book/Page 1483/331
Land
Search
Selection
Themes
Markup
Abutters
Woonasquatucket River
Woonasquatucket River Greenway
Newman Ave
Tag Dr
Woonasquatucket Ave
Rosemont Terrace
Glossop St
Lakewood St
Fruit Hill Ave
Bel Air Dr
Klondike St
Herschel St
Westcott Ave
Tilton Ave
Bucklin St
Osgood Ave
Becker Ave
Rosemont Ave
Jackson Ave
Greenville Ave
Clinton St
Waterman Ave
Yale Ave
Vermont St
Cecil St
Seville Ave
Higgins St
Archer Ave
Fairmount Ave
Killingly St
Lee St
Goldsmith St
Manton Ave
CEM
128
41.835789,-71.472684
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Rhode Island Coastal and Estuary Habitat Restoration Fund
Full Proposal Form for Planning Projects 2022/2023

****for design or construction projects please use Full Proposal Form**

1. PROJECT SUMMARY

1. **Project Title:** Improving Resilience and Habitat Value at RI DEM Public Shoreline Access Sites

2. **Project Location and coordinates** *(include map)*: Gull Cove, Portsmouth / Quonochontaug Breachway, Charlestown

3. **Habitat type** *(River System, Salt Marsh, Seagrass, Shellfish Bed, other)*: Other

4. **If other, please specify**: Salt marsh / coastal buffer

5. **Targeted restoration technique** *(e.g. re-vegetation, tidal restoration, etc.)*: Re-vegetation, shoreline stabilization with natural materials, removal of pavement / infrastructure along shoreline, bank re-grading

6. **Potential future benefits resulting from proposed planning project:** Reduced erosion and sedimentation, increased area of salt marsh habitat, increased area of vegetated buffer, public safety improvements, increased accessibility to shoreline public access sites, increased resilience to sea level rise

7. **Project partners** *(organizations providing financial or other support to the project)*: Save The Bay, Narragansett Bay Research Reserve

8. **Is this an ongoing project that has previously received funds from the CRMC Coastal and Estuarine Habitat Restoration Fund?** no **If yes, year(s) funding was awarded:**

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2. PROJECT MANAGER CONTACT INFORMATION

1. **Name:** Jillian Thompson

2. **Organization**: RI Department of Environmental Management

3. **Address:** 235 Promenade St.

4. **City:** Providence **5. State:** RI **6. Zip:** 02908

7. **Phone:** 401-222-2776 ext. 277-7235 **8. Email:** jillian.thompson@dem.ri.gov

9. **Property Owner(s):** RI Dept. of Environmental Management / State of RI

3. BUDGET SUMMARY

(List individuals or organizations providing financial or in-kind support to the project under Project Partners)

Amount Requested from Trust Fund		$50,000
Matching Funds	**Project Partner(s)**	**Amount of Match**
	NFWF National Coastal Resilience Fund	$200,150
	TOTAL PROJECT COST	**$250,150**

IV. PROPOSAL NARRATIVE

1. Justification and Purpose

Briefly describe the proposed planning project. What questions does it propose to answer? What are the restoration goals and anticipated long-term and short-term outcomes. Describe the human impacts and previous restoration activities within the proposed study area. If the project area includes multiple impacted sites, please describe the impacts and previous restoration activities at each.

The proposed project **seeks to address climate change and sea level rise challenges facing shoreline habitats and public access points by using nature-based solutions to restore multiple community and habitat benefits**. The RI Dept. of Environmental Management (RIDEM) manages over 80 shoreline access points throughout Narragansett Bay and the RI South Shore. RIDEM has seen a dramatic increase in use of its properties—including shoreline access sites—during the COVID-19 pandemic as people have sought outdoor areas for safe recreation. These shoreline access points provide a vital connection for the public to Rhode Island coastal waters and the activities that they support. Activities such as recreational fishing, shell fishing, birdwatching, and boating are important to tourism and help to engender a sense of stewardship for coastal areas. Given the constant and increasing pressure of private development in coastal areas, it is important to maintain public shoreline access points to ensure access to Rhode Island's natural resources for future generations. However, in addition to experiencing increased usage over the last several years, many state-owned shoreline access sites are under threat from climate change and sea level rise. Increased coastal flooding, more intense storms and shoreline erosion have damaged portions of some sites, making them unsafe for vehicle and pedestrian access and damaging natural shoreline habitats. In some locations, damage to road and parking areas have made the sites inaccessible to individuals with disabilities or mobility issues.

With this application, we propose to move forward two adaptation projects at shoreline access sites owned by the RI Dept. of Environmental Management. Final designs and permit applications would be completed for projects at Gull Cove in Portsmouth, RI and at the Quonochontaug Pond Breachway in Charlestown, RI to bring these projects to shovel-ready status. Designs would use nature-based approaches such as planting of native shoreline vegetation, restoration of coastal wetlands, removal of damaged infrastructure and impervious surfaces, management of stormwater, and reconfiguration of vehicular access (roads and parking) to move vehicles out of harm's way. Completed nature-based plans for these sites will ultimately improve public access and safety, increase the amount of native vegetation, reduce shoreline erosion and release of sediment into adjacent waterbodies, and increase the protection of the more sensitive portions of these sites

from human impacts. In the long term, increased habitat resilience will help to enhance fish and wildlife populations and further increase the appeal of these locations as natural areas for outdoor recreation.

At the **Gull Cove site in Portsmouth**, increased flooding has eroded an access road to a shoreline parking area (formerly a boat ramp, now removed) and damaged the surface of an adjacent parking area. Flooding and erosion at the approximately 4-acre fishing access site has produced unsafe conditions where vehicles potentially could be stranded during high tide events. Vehicle use also impacts coastal and intertidal habitats, and the parking area is unsafe for pedestrians, especially those with disabilities or who have mobility issues. The area available to launch small craft (kayaks and canoes) is decreasing in size as the shoreline continues to erode. To-date, a site elevation survey, existing conditions assessment, conceptual preliminary design and construction cost estimate have been completed for the site.

At the **Quonochontaug Breachway site in Charlestown,** significant site improvements have been made in recent years, some with support from the NFWF National Coastal Resilience Fund, including a 30-acre salt marsh restoration and barrier spit restoration project to enhance both salt marsh habitat and spawning areas for horseshoe crabs. A new boat ramp and floating dock were recently installed using funds from U.S. Fish & Wildlife Service's Wildlife and Sport Fish Restoration Program. The public access is now considerably safer and more user-friendly than the ramp it replaced, and a section of the shoreline adjacent to the parking area was stabilized and planted with native vegetation. However, improvements are still needed to address erosion and human use impacts along the site's access road, and to make the approximately 9.5-acre site more resilient to sea level rise. To-date, a site elevation survey, existing conditions assessment and 60% designs have been completed for the access road phase of the project, as well as a long-term monitoring plan.

2. Project Activities, Schedule and Work Plan

Describe the planned project activities, and explain how each activity will help to plan for restoration of ecosystem functions. List specific project activities and when they will occur (month and year). Indicate when annual and final project reports will be submitted.

For this project, we propose to build upon previous efforts to produce final plans and permit applications for two state-owned shoreline access projects: Gull Cove in Portsmouth and Quonochontaug Pond Breachway in Charlestown, RI. If awarded, funds from this program will support the habitat-related aspects of design including restoration planting plans for areas identified for revegetation. It is anticipated that with the completion of these activities, the project team will be well-positioned to secure funding to construct both the Gull Cove and Quonochontaug Breachway resilience projects. It is anticipated that milestones related to this proposal will be completed within 18 months of the project start date.

Estimated Implementation Timeline and Milestones:

Month	Anticipated Milestone
February—May 2023 (months 1—4)	Project Team Coordination and Stakeholder Outreach
May—August 2023* (months 4—7)	Consultant Selection by Competitive Bid Process
August—December 2023 (months 7—11)	Finalization of Engineering and Construction Cost Estimates
November 2023—February 2024* (months 10—13)	Development of State and Federal Permit Applications
February—August 2024* (months 13—18)	Development of Construction RFP

One of the primary goals for the designs at each site will be to increase shoreline habitat functions and values. This will be achieved by removing hardened infrastructure (e.g. pavement) and establishing upland coastal buffer and coastal wetland vegetation along the shoreline. Low-lying coastal upland areas will be designed as meadows that support warm season grasses, and will allow for inland migration of coastal wetland habitats as sea levels continue to rise. Only native plant species will be used in restoration plantings, and existing invasive plant species will be identified for removal and / or management. Where practical, plant species with high value as pollinator habitat and food value to bird species will be specified. Where possible, parking will be relocated to reduce vehicular impacts to shoreline habitats such as compaction of soils and exacerbation of shoreline erosion.

3. Coordination and Public Support

How will the project lead organization coordinate with other stakeholder groups, and which groups will be included? Describe planned or completed community / stakeholder education and outreach efforts.

A project team will be convened, consisting of individuals who have previously worked on the Gull Cove and Quonochontaug Breachway site planning efforts, as well as new members from the RIDEM Division of Planning and Development and the Division of Fish and Wildlife whose expertise is needed to move the projects forward. NBNERR will also be utilizing federal capacity-building funds made available to the Reserve System thanks to the Bipartisan Infrastructure Law to bring on additional personnel for project coordination and management. The project team will convene to discuss project progress to-date and review current design documents. The team will meet with the RIDEM Public Access Committee and the Division of Water Resources to discuss strategies for finalizing project designs and permitting. The project team will develop a stakeholder outreach plan and schedule to gather additional input from interested user groups, experts, and the community on the current designs for each site. Input received will inform the final design phase, which will continue to emphasize nature-based solutions and will account for projected sea level rise to increase the resilience of these public access sites.

Stakeholder groups for both project sites will be identified by the project team and could include user groups such as boaters, recreational fishing groups, waterfowl hunters, wildlife enthusiasts, aquaculturists, and community or neighborhood associations. These groups will be engaged via targeted meetings and virtual workshops to provide feedback on the project conceptual designs. The project team will coordinate closely with the towns of Portsmouth and Charlestown to identify municipal concerns and inform the final project designs. Town entities engaged will likely include municipal planning departments, police and emergency response departments and departments of public works. The RI Dept. of Transportation will be consulted during the final design process for the Gull Cove project in Portsmouth as they control the parcel of land, approximately 20 acres, immediately adjacent to the RIDEM parcel. There will also be opportunity for public comment on both final project designs during the state and federal permit processes.

4. Planning Consistency and Restoration Priority

Is the proposed project consistent with the goals of a local, state or regional planning initiative? Please specify initiative and explain (see CRMC website for guidance). Does the proposed project involve a state, regional or federal priority habitat restoration need or special consideration? Please specify and explain (see CRMC website for guidance).

The proposed project aligns with goals and priorities set forth in the Rhode Island Wildlife Action Plan (RI WAP), which include actively facilitating compositional shifts in small habitat patches at heavily managed sites, changing or moving land use activities that inhibit marsh migration, adopting activities that facilitate migration and removal of physical barriers to inland migration of shoreline habitats. The proposed project is also well aligned with the recommended climate resilience actions set forth in Resilient Rhody, An

Actionable Vision for Addressing the Impacts of Climate Change in Rhode Island, which include identifying opportunities for retreat and infrastructure relocation on state-owned properties that can serve as 6 demonstration sites for shoreline adaptation, and identifying opportunities for retreat, removal of derelict infrastructure, and enhancement of natural shoreline areas.

Both proposed project sites (Gull Cove and Quonochontaug Breachway) have been identified as priority areas for habitat restoration in the state, given the previously funded work that has been done at both locations. With the support of the NFWF National Coastal Resilience Fund (NCRF), RI partners created a statewide inventory of potential public shoreline adaptation projects. This Shoreline Adaptation, Inventory and Design (SAID) project identified over 200 potential shoreline adaptation projects throughout the state, and project partners including URI's Coastal Resources Center and Save The Bay worked closely with municipalities to prioritize projects for design and implementation. The project team then worked with consultant GZA GeoEnvironmental to complete 60% designs and construction cost estimates for nine projects. While the focus of the SAID effort was largely municipally owned sites, state owned properties were also considered, and several were identified as potential project sites. One fishing access site owned by RIDEM, Gull Cove in Portsmouth, RI, was selected for 60% design and construction cost estimate development, which were completed in March of 2022.

Concurrent with the SAID effort, the RIDEM Division of Planning and Development secured NFWF NCRF funding to address sea level rise impacts to its fishing access area on Quonochontaug Pond in Charlestown, RI—the only public access point on the 732-acre pond that contains important habitats such as salt marsh, shellfish, and eelgrass beds. Previous improvements had been made to the site, including a new boat ramp, shoreline erosion control measures, and a salt marsh restoration and horseshoe crab spawning restoration effort supported by NFWF Hurricane Sandy Resilience funding. The most recent NCRF award supported preliminary design work to implement nature-based solutions to address erosion and flooding impacts to the site's access road and breachway shoreline. Consultant GZA GeoEnvironmental produced 60% designs and a long-term monitoring plan for road and parking lot relocation, shoreline protection, coastal habitat enhancement, and stormwater management at the site.

5. Species of Concern

Does the planning project address threats to wildlife species listed as federally or state endangered, threatened, or species of concern within Rhode Island? Please specify which species will benefit and how.

The proposed project site at Quonochontaug Pond is adjacent to an extensive back-barrier marsh and coastal lagoon complex that supports a wide variety of species listed as Species of Greatest Conservation Need within the RI Wildlife Action Plan, including Atlantic horseshoe crabs (*limulus polyphemus*), saltmarsh sparrows (*Ammospiza caudacuta*), American black ducks (*Anas rubripes*), snowy egrets (*Egretta thula*), great egrets (*Ardea alba*), sanderlings (*Calidris alba*) least terns (*Sternula antillarum)*, common terns (*Sterna hirundo*) and piping plovers (*Charadrius melodus*). The project site at Gull Cove also supports a variety of coastal wildlife within the RI Wildlife Action Plan, including snowy egrets (*Egretta thula*), great egrets (*Ardea alba*), sanderlings (*Calidris alba*), American oystercatchers (*Haematopus palliates*), glossy ibis (*Plegadis falcinellus),* clapper rails (*Rallus longirostris*), and common terns (*Sterna hirundo*). Site improvements will help to slow the rate of shoreline erosion and protect adjacent habitats from climate change and sea level rise impacts, and will increase the area of vegetated habitat available. Relocating vehicular access away from sensitive habitats and increasing shoreline vegetation at both sites will help to filter pollutants and mitigate erosion, protecting and improving water quality. Planting design will specify only RI native plants appropriate for shoreline habitats that will provide benefit to local fish and wildlife species.

6. Climate Change and Coastal Resiliency

How will present and future impacts of climate change be considered during the project planning and design phases? What impact will the final project have on resilience of coastal or estuarine habitat to climate change?

As described above, the purpose of the proposed project is to create final designs for restoring and enhancing two shoreline access points and the natural habitats surrounding them to address impacts from flooding and sea level rise. At both sites, erosion has damaged access roads, parking areas, fringe salt marsh and vegetated coastal buffers. Our approach will be to use nature-based approaches such as reinforcing slopes with natural materials, and planting vegetation to stabilize shorelines and expand habitat areas. Sea level rise will be considered when creating final designs. By increasing the amount of native vegetation, reducing shoreline erosion and the release of sediment into adjacent waterbodies, and protecting more ecologically sensitive portions of these sites from human impacts, these project locations will be more resilient to climate change.

7. Environmental Justice

Will the proposed project take place within or otherwise benefit environmental justice "priority areas" as defined by the Narragansett Bay Estuary Program's analysis of Environmental Justice in the Narragansett Bay Region? Does the proposed project incorporate Environmental Justice concerns as defined by the US EPA's Guidance on Environmental Justice and Equitable Development?

Neither project locations are considered "priority areas" as defined by the Narragansett Bay Estuary Program's analysis of Environmental Justice in the Narragansett Bay Region. However, both project sites are state-owned properties that are open to the public year-round, and would benefit all Rhode Islanders by improving public shoreline access and ensuring that it is safe for people of all abilities. This is especially important in locations such as Quonochontaug Pond in Charlestown, where most of the pond shoreline is privately owned. The Gull Cove site is less than 5 miles from the city of Fall River, MA, which has a population of 94,000—80% of which lives within Census blocks identified as environmental justice communities. The project team will thoughtfully engage all types of user groups during this planning process, and will pay special attention to encouraging participation and input by traditionally under-served community members and users. This project provides an opportunity for the State of RI to take proactive measures to increase safe, public access to coastal areas.

8. Permitting

List any federal, state or local permits required to complete the project and the permit application status for each.

We plan to work with a consultant to develop applications for required state and federal permits. The project team will request pre-application meetings with relevant state and federal agencies to review partial designs prior to permit application submittal. Where necessary, the project team will coordinate with permitting agencies to refine final project designs based on input received during the permit review process.

Required permits are anticipated to include:
1. RI Coastal Resources Management Council Coastal Assent
2. US Army Corps of Engineers CWA Section 404 permit (General Permit Self-Verification or Pre-Construction Notification)
3. DEM Water Quality Certification

It is anticipated that at the completion of this design and permitting project, the project team will then pursue funding to construct both the Gull Cove and Quonochontaug Breachway resilience projects. The project team will identify potential sources of construction funding concurrent to this final design and permitting phase.

9. Capacity of Lead Organization (attach additional materials if necessary)

Demonstrate the capacity of the lead and/or partner organizations to successfully complete the proposed project by providing any or all of the following: a) a description of the organization(s) b) resume(s) or summary of qualifications of involved personnel c) evidence of successfully completed habitat restoration or conservation planning projects.

The following individuals and organizations will comprise the project team and key stakeholder groups for both nature-based project designs. The project team will seek out input from other experts, stakeholders and organizations as additional needs and issues are identified.

- Team member: **Jillian Thompson**, RIDEM Division of Planning and Development, will assist with project and contract management. Jillian is the Conservation Engineer for The Nature Conservancy and Rhode Island DEM, she provides engineering and project management support for public access projects. She has prior experience (six years) in groundwater remediation and project management for the State of Rhode Island and three years of experience in stormwater management design and community-based project learning in the State of New Jersey through the Rutgers Cooperative Extension Water Resources Program. She has provided project management services for the Quonnie boat ramp improvement project completed in 2020, the Lincoln Woods State Park boat ramp improvement project in 2021, Quonnie Coastal Resiliency NFWF project for fiscal year 2020-21 and is currently managing multiple large-scale state-owned dam rehabilitation projects throughout the state. Jillian has developed working relationships with many of the firms on the state Master Price Agreement and is knowledgeable about the state contracting process which ensures an efficient and transparent engagement of qualified firms for projects.

- Team Member: **Lauren Miller-Donnelly**, RIDEM Division of Planning and Development, will assist with land use and acquisition discussions with RI Department of Transportation. Lauren is the Public Access Program Coordinator for The Nature Conservancy in partnership with DEM. She provides planning, project management, outreach, and administrative support to the land acquisition and public access programs of DEM. Prior to working for TNC Lauren was the Property Manager for Mass Audubon South Coast Sanctuaries for 15 years where she acted as the volunteer coordinator as well as implementation of state and federal grant projects including trail development and building, early successional habitat management, saltmarsh assessment and restoration, diamondback terrapin management and piping plover-related projects. She earned a B.A. in Marine Biology from Boston University and a Masters in Environmental Science with a Conservation Biology focus from Antioch New England University.

- Team Member: **Caitlin Chaffee**, Reserve Manager at the Narragansett Bay National Estuarine Research Reserve, will serve as project coordinator. Caitlin manages programs within the NBNERR sectors of research, education, training, and stewardship. She has 18+ years of professional experience in the fields of environmental science and natural resources management, previously working as a coastal policy analyst with the Rhode Island Coastal Resources Management Council for 14 years. She has extensive experience in building partnerships, managing large-scale technical projects and diverse project teams, and communicating with a broad range of stakeholders. While at CRMC, she applied for and successfully managed over $8 million in federal habitat restoration grants. NBNERR Reserve Manager personnel time for this proposal will be supported by NOAA

NERR operations funding and RI Department of Environmental Management matching funds. Additionally, this project will leverage capacity-building funding through NOAA's Office for Coastal Management to provide personnel support for project and contract management.

- Team Member: **Wenley Ferguson**, Director of Restoration at Save The Bay, will serve as technical consultant to the project. Wenley has worked at Save The Bay since 1990 on habitat and water quality assessment and restoration projects throughout Narragansett Bay and its watershed. Wenley works with local, state, and federal partners on the identification, design, and implementation of salt marsh restoration and adaptation projects. In recent years, her focus has been on assessing the impacts of accelerated sea level rise on salt marshes through a statewide assessment. Wenley led site visioning design events as part of the SAID program, and she has implemented several coastal adaptation projects with municipal and state partners to address flooding/erosion and enhance coastal habitats. With the help of student and adult volunteers, Wenley involves community stewards in all phases of the restoration projects from monitoring and planting to long term maintenance.

- Organizational Partners and stakeholders: Department of Environmental Management, as site property owner and manager, will serve as the lead agency for this effort. It is anticipated that the RIDEM Divisions of Planning and Development, Fish and Wildlife, Marine Fisheries and Water Resources will be engaged throughout the final design process. The Coastal Resources Management Council will be the primary state permitting agency for both projects and will be consulted to ensure final designs are consistent with the state's Coastal Resources Management Program. The RI Department of Transportation will be consulted during the Gull Cove design process as owner of the parcel abutting the project site. The Quonochontaug project will require coordination with the Town of Charlestown's Coastal Pond Management Commission. Additional organizations targeted for outreach and consultation for the Quonochontaug project will likely include the Salt Ponds Coalition, the Shelter Harbor Conservation Society, the Weekapaug Foundation for Conservation, and user groups such as the RI Saltwater Anglers Association.

10. External Factors and Climate Change

Identify existing external (off-site) factors that may be affecting habitat within the study area. How will external factors be considered? What are the likely effects of climate change and sea level rise within the study area and how will these be considered?

Sea level rise and increased intensity of coastal storms are likely to increase tidal flooding and will be incorporated into the design for both sites, ensuring that access roads and parking areas are reconfigured or relocated to higher elevations that are less vulnerable to erosion and flooding, and do not create a public safety hazard during high tide and storm events. Plantings will be designed with sea level rise in mind, and in anticipation of shoreline habitat migration inland over time.

V. EVALUATING PROJECT SUCCESS (one page maximum)

1. Performance Measures and Deliverables

How will the success of the project be measured in relation to the restoration goals set forth in this proposal? List all deliverables (e.g. reports, updates, websites, etc.) associated with the project.

Specific metrics to be measured will include:
1. The number of engineering and design plans developed to construction ready (90-100%) (we anticipate completing two sets of construction ready plans, one each for Gull Cove and Quonochontaug); and
2. The number of governmental entities participating in the project (we anticipate at least four government entities to participate in these projects), including the towns of Portsmouth and Charlestown, RI Department

of Transportation and the RI Department of Environmental Management Divisions of Fish and Wildlife and Planning and Development. RI Department of Environmental Management Bureau of Natural Resources will play a leadership role in coordinating project and contract management.

In addition to these metrics, for each of the two final designs we will record the total area of impervious surface to be removed and vegetated shoreline habitat to be restored.

2. Monitoring Plan

Describe any monitoring activities that are part of the planning project. For each monitoring activity list the frequency and month/year of start and end date and the parameters measured. List the entity or entities responsible for funding and carrying out each monitoring activity, and describe how results will be made available to CRMC and the public. If using an established monitoring protocol, please provide references (see CRMC website for information on established monitoring protocols).

Initial site assessments have been completed for both sites, however additional information will be collected as part of the planting plan design, including existing vegetation communities and the presence of invasive plants in need of removal and/or management. A monitoring plan to evaluate site resilience over time will be developed as part of construction funding application development.

VI. PROJECT BUDGET TEMPLATE

BUDGET CATEGORY	CRMC REQUEST	MATCH	MATCH PENDING OR SECURED? (select one)	SOURCE OF MATCH	TOTAL
Contractual services for landscape planting design	$50,000				$50,000
Contractual services for final design, engineering and permitting		$200,000	Secured	NFWF National Coastal Resilience Fund	$200,000.00
Other Direct Costs		$150	Secured	NFWF National Coastal Resilience Fund	$150.00
TOTAL	**$50,000**	**$200,150**		**TOTAL PROJECT COST**	**$250,150.00**

VII. BUDGET NARRATIVE (one page maximum)

Please provide a description and justification for each line item included in the project budget form (e.g. for personnel costs, provide hourly and fringe rates, for travel specify rate and estimated number of miles). Please specify any match requirements for each source of funding. Please include costs associated with required annual and final reports to CRMC. Be sure to detail how CRMC funds will be used.

CRMC funds would be used as a nonfederal matching contribution for NFWF National Coastal Resilience Funding that has been awarded for this project ($200,150.00). The $50,000 requested would support contractual services for restoration planting design, either as a subcontract to the main consulting contract or a separate contract with a landscape architecture or design firm.

IX. ADDITIONAL MATERIALS

Please include the following with your application:

X_ Site and Locus Maps

___ Ground-level photographs of existing site conditions

___ Aerial photographs, if available

X_ Preliminary design drawings, maps or engineering plans, if available

X___ Pertinent physical, ecological, biological, and cultural / historical survey data

X_ Letters of support

AUTHORIZED SIGNATURE

AUTHORIZED AGENT OF LEAD ORGANIZATION

_____ 01-27-2023

Signature **Date**

Return your completed proposal by 4:00 p.m. on **January 27, 2023** to:

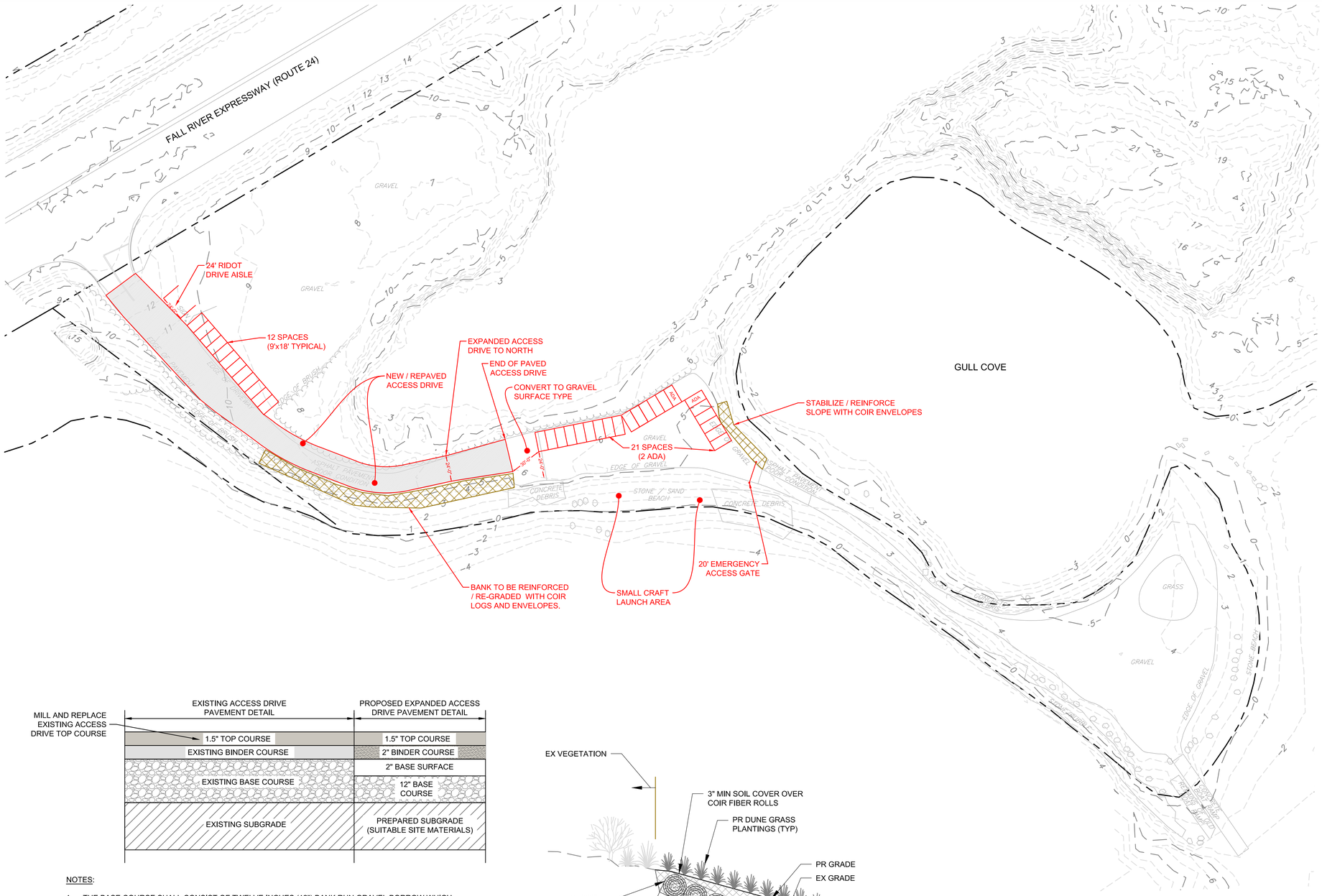
Caitlin Chaffee
NBNERR
RI Dept. of Environmental Management
235 Promenade Street
Providence, RI 02908

caitlin.chaffee@dem.ri.gov

Applicants are required to submit one (1) signed hard copy of the proposal form and one (1) electronic copy in Adobe PDF format. **Please submit electronic copy as a **SINGLE PDF FILE** containing all application materials.**

Contact Caitlin Chaffee at **401-222-4700 xt. 277-4417** with any questions.

CRMC
COASTAL RESOURCES MANAGEMENT COUNCIL



EXISTING LEGEND

NOT ALL ITEMS MAY APPEAR ON PLANS

- DROP INLET CATCH BASIN
- CATCH BASIN INLET STONE
- CATCH BASIN
- SEWER MANHOLE
- GAS GATE VALVE
- SIGN
- BOULDER / CONCRETE BLOCK
- STONE WALL
- TREE
- FEMA BOUNDARY / ZONE
- DRAIN LINE
- MAJOR CONTOUR
- MINOR CONTOUR
- PROPERTY LINES - APPROXIMATE
- WOOD GUARDRAIL
- COASTAL FEATURE
- CRMC 200 FOOT JURISDICTION LINE
- WOOD STOCKADE FENCE
- RETAINING WALL
- TREE / BRUSH LINE
- BUILDING/STRUCTURE

REFERENCES

BASE MAP DEVELOPED FROM THE FOLLOWING:

ELECTRONIC CAD FILE "FINAL SURVEY 09-12.DWG" PROVIDED TO GZA BY RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT.

CONTOUR DATA SHOWN ON THE PLAN IS FROM THE SUPPLIED ELECTRONIC CAD FILE. TOPOGRAPHIC ELEVATIONS WERE CONVERTED FROM MLW TO NAVD 88 BY A VERTICAL TRANSLATION OF -2.07 FEET. AREAS OUTSIDE THE SUPPLIED CAD FILE WERE SUPPLEMENTED BY A T-4 TOPOGRAPHICAL SURVEY STANDARD AS ADOPTED BY THE RHODE ISLAND BOARD OF REGISTRATION FOR PROFESSIONAL LAND SURVEYORS; SAID DATA IS BASED ON ELEVATION INFORMATION THAT WAS COLLECTED WITH AIRBORNE LIDAR TECHNOLOGY FOR THE ENTIRE AREA OF RHODE ISLAND BETWEEN APRIL 22 AND MAY 6, 2011 AS PART OF THE NORTHEAST LIDAR PROJECT. THIS DATA'S POSITIONAL ACCURACY AND RELIABILITY HAS NOT BEEN VERIFIED BY GZA AND IS SUBJECT TO CHANGES AN AUTHORITATIVE FIELD SURVEY MAY DISCLOSE.

ALL ELEVATIONS SHOWN ON PLANS ARE IN U.S. FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

THESE DATA WERE CREATED FOR INFORMATIONAL, PLANNING AND GUIDANCE USE ONLY. THEY ARE A GENERAL REFERENCE, NOT A LEGALLY AUTHORITATIVE SOURCE FOR THE LOCATION OF NATURAL OR MANMADE FEATURES. PROPER INTERPRETATION OF THESE DATA MAY REQUIRE THE ASSISTANCE OF APPROPRIATE PROFESSIONAL SERVICES. THE CARTOGRAPHIC REPRESENTATIONS DEPICTED HAVE NOT BEEN VERIFIED BY A RI REGISTERED PROFESSIONAL LAND SURVEYOR AND ARE NOT INTENDED TO BE USED IN PLACE OF A SURVEY.

PROPERTY LINE AND PARCEL DATA SOURCED FROM TOWN OF PORTSMOUTH ONLINE GIS DATABASE

N W E S

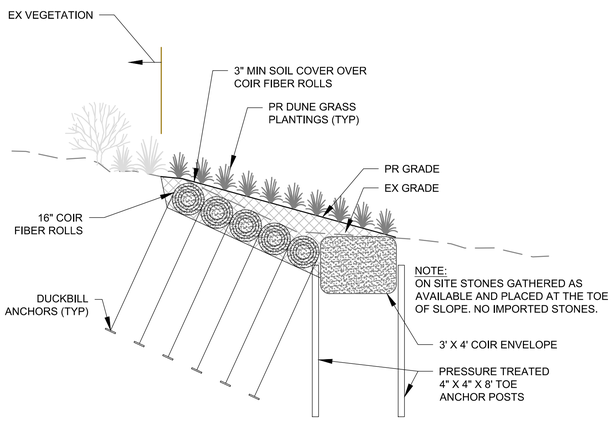
0 25' 50' 100' 150'

SCALE IN FEET 1" = 50'

NOTES:

1. THE BASE COURSE SHALL CONSIST OF TWELVE INCHES (12") BANK RUN GRAVEL BORROW WHICH CONFORMS TO THE REQUIREMENTS OF SUBSECTION M.01.09 TABLE I, COLUMN I OF THE RIDOT RI STANDARD SPECIFICATIONS AND COMPLY WITH THE TOWN OF PORTSMOUTH STREET CONSTRUCTION STANDARDS AND SPECIFICATIONS.
2. THE BASE SURFACE SHALL CONSIST OF PROCESSED GRAVEL A COMPACTED DEPTH OF TWO INCHES (2") OF CRUSHED BANK RUN GRAVEL WITH A FOREIGN CONTENT OF NOT MORE THAN FIFTEEN PERCENT (15%), WHICH CONFORMS TO THE REQUIREMENTS OF SUBSECTION M.01.09. TABLE I, COLUMN II OF THE RI STANDARD SPECIFICATIONS.
3. THE BINDER COURSE SHALL CONSIST OF TWO INCHES (2") OF BITUMINOUS CONCRETE PAVEMENT (HOT MIX) CLASS 12.5 CONFORMING TO THE REQUIREMENTS OF SECTION 401 OF THE RI DOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
4. THE SURFACE COURSE SHALL CONSIST OF ONE-AND-ONE-HALF INCHES (1 1/2") OF BITUMINOUS CONCRETE PAVEMENT (HOT MIX) CLASS 9.5 CONFORMING TO THE REQUIREMENTS OF SECTION 401 OF THE RI DOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

ACCESS DRIVEWAY DETAIL
NOT TO SCALE



TYPICAL COIR LOG & COIR ENVELOPE SLOPE STABILIZATION DETAIL
NOT TO SCALE

NO.	ISSUE/DESCRIPTION	BY	DATE

GULL COVE
SHORELINE ADAP & INVEN DESIGN PROJECT

CONCEPT PLAN

PREPARED BY:		PREPARED FOR:	
GZA		COASTAL RESOURCES MANAGEMENT COUNCIL	
PROJ MGR: RAD	REVIEWED BY: TRG	CHECKED BY: EAS	1 OF 1
DESIGNED BY: RAD	DRAWN BY: CMC	SCALE: AS NOTED	
DATE: SUBMISSION DATE	PROJECT NO. 34826.00	REVISION NO. 0	

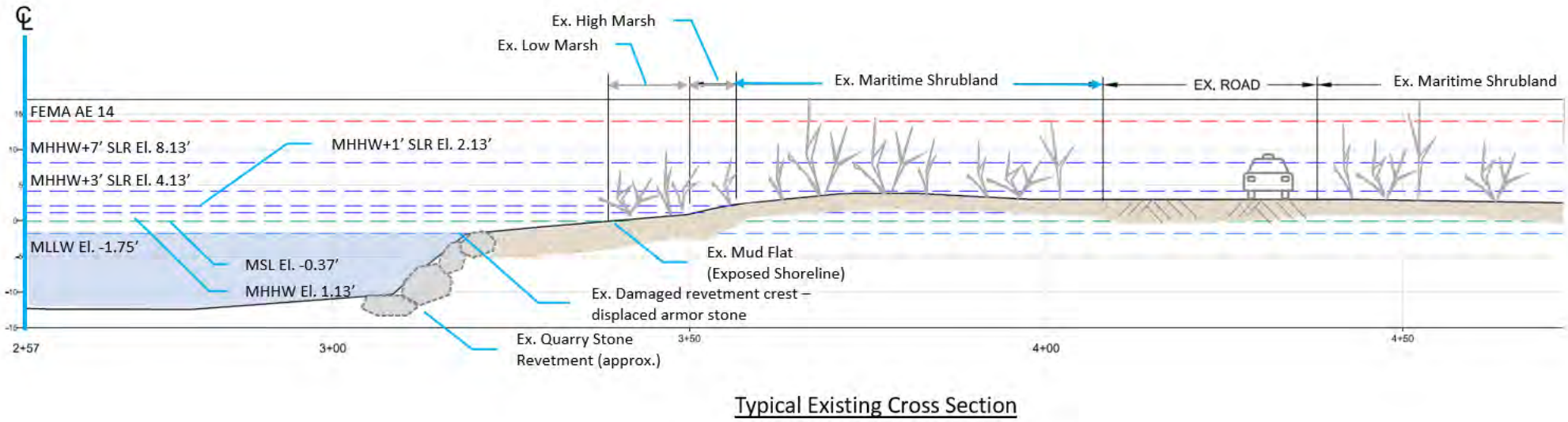


Figure 4: Quonnie Pond Breachway - Conceptual Cross-Section of the Existing Conditions

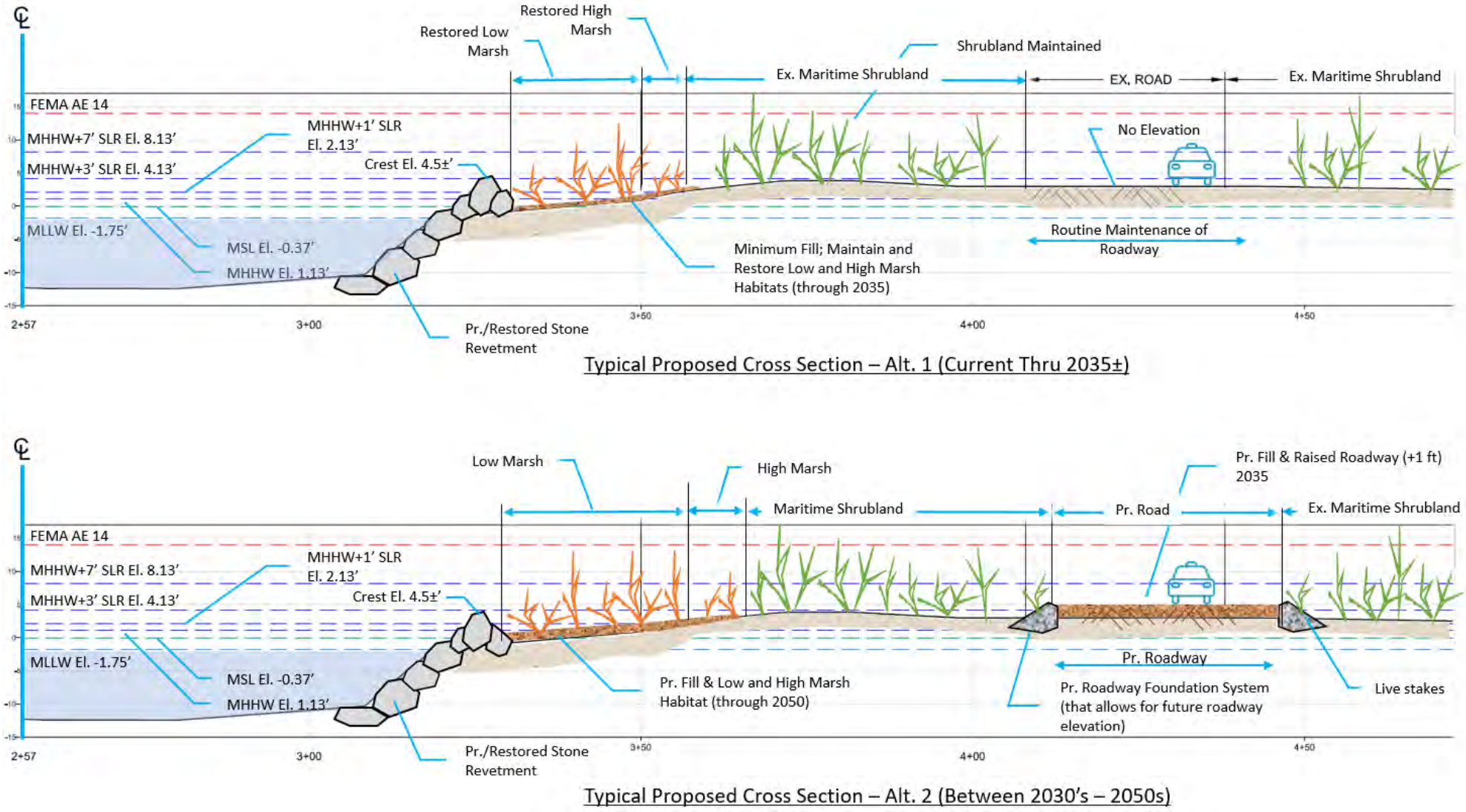
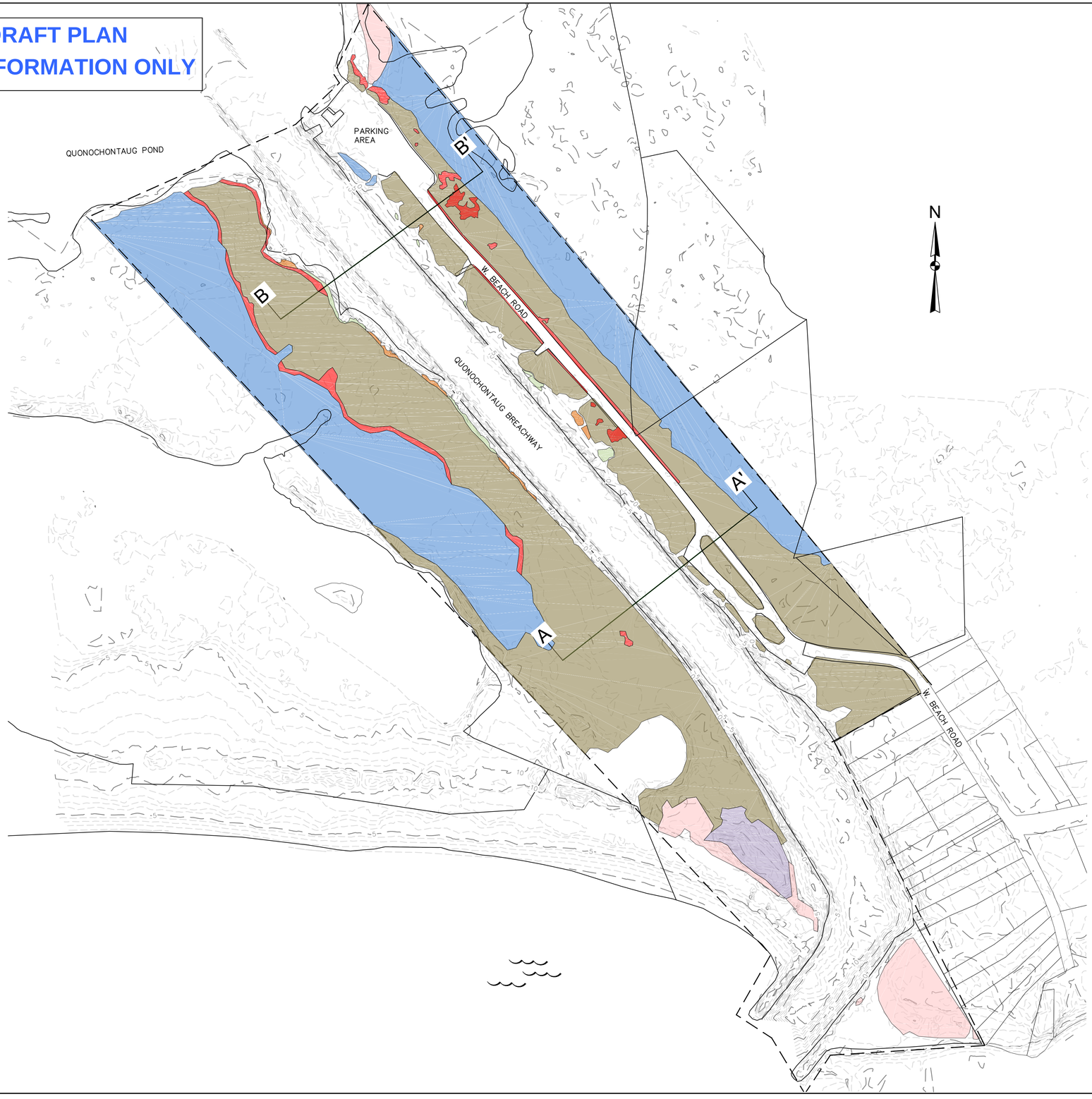


Figure 5: Quonnie Pond Breachway - Conceptual Cross-Section with Proposed Resiliency Measures

DRAFT PLAN
FOR INFORMATION ONLY



GENERAL NOTES

1. ELEVATION DATA DEVELOPED FROM SURVEYS PERFORMED BY GZA PERSONNEL BETWEEN JANUARY 15TH AND 18TH, 2021.
2. MEAN TIDE VALUES WERE REFERENCED FROM NOAA TIDAL DISK BENCHMARK 8455022.
3. ALL ELEVATIONS ARE IN NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88).

LEGEND

- MAJOR CONTOUR
- MINOR CONTOUR
- PROPERTY LINE
- APPROXIMATE PROJECT LIMITS

HABITAT AREAS

- THIN LAYER DEPOSITION SITE
- MARITIME SHRUBLAND
- DUNE
- LOW MARSH
- HIGH MARSH
- PINE
- PHRAGMITES

N W E S

0 60' 120' 240' 360'
SCALE IN FEET 1" = 120'

NO.	ISSUE/DESCRIPTION	BY	DATE

QUONOCHONTAUG BREACHWAY SITE ASSESMENT AND DESIGN FOR COASTAL RESILIENCY
CHARLESTOWN, RHODE ISLAND

EXISTING CONDITIONS PLAN

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
RIDEM

PROJ MGR: BW	REVIEWED BY: BW	CHECKED BY: RJM	DRAWING 1
DESIGNED BY: JZ	DRAWN BY: CMC	SCALE: AS NOTED	
DATE: MARCH, 2021	PROJECT NO. 174739.00	REVISION NO. 0	SHEET NO. 1 OF 2

GENERAL NOTES

1. ELEVATION DATA DEVELOPED FROM SURVEYS PERFORMED BY GZA PERSONNEL BETWEEN JANUARY 15TH AND 18TH, 2021.
2. MEAN TIDE VALUES WERE REFERENCED FROM NOAA TIDAL DISK BENCHMARK 845022.
3. ALL ELEVATIONS ARE IN NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88).

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED CONTOUR
- PROPERTY LINE
- APPROXIMATE PROJECT LIMITS
- MEAN HIGH WATER
- MEAN LOW WATER
- PROPOSED PIPE
- PROPOSED SWALE
- PROPOSED REVETMENT RESTORATION
- PROPOSED MARSH RESTORATION
- PROPOSED PLANTING AREA

Pipe	Type	Diameter	Length	Inv. In	Inv. Out
1	RCP	6"	7'	3.0'	2.0'
2	RCP	6"	15'	3.0'	2.0'
3	RCP	6"	32'	3.0'	2.0'
4	RCP	6"	25'	3.0'	2.0'
5	RCP	6"	45'	3.0'	2.5'
6	RCP	12"	25'	2.0'	1.5'

Swale #	Length	Top Width	Bottom Width	Side Slope	Bottom El.
1	160'	5'	1'	3:1	3'
2	240'	5'	1'	3:1	3'
3	143'	5'	1'	3:1	3'
4	345'	5'	1'	3:1	3'
5	136'	5'	1'	3:1	2.5'
6	270'	5'	1'	3:1	2.5'
7	446'	5'	1'	3:1	3'

Wier #	Type	Crest Length	Crest Breadth	Top of Crest El.
1	Broad Crested Rectangular Weir	5'	0.5'	3.25'
2	Broad Crested Rectangular Weir	5'	0.5'	3.25'
3	Broad Crested Rectangular Weir	5'	0.5'	3.25'
4	Broad Crested Rectangular Weir	16'	0.5'	3.5'

NO.	ISSUE/DESCRIPTION	BY	DATE

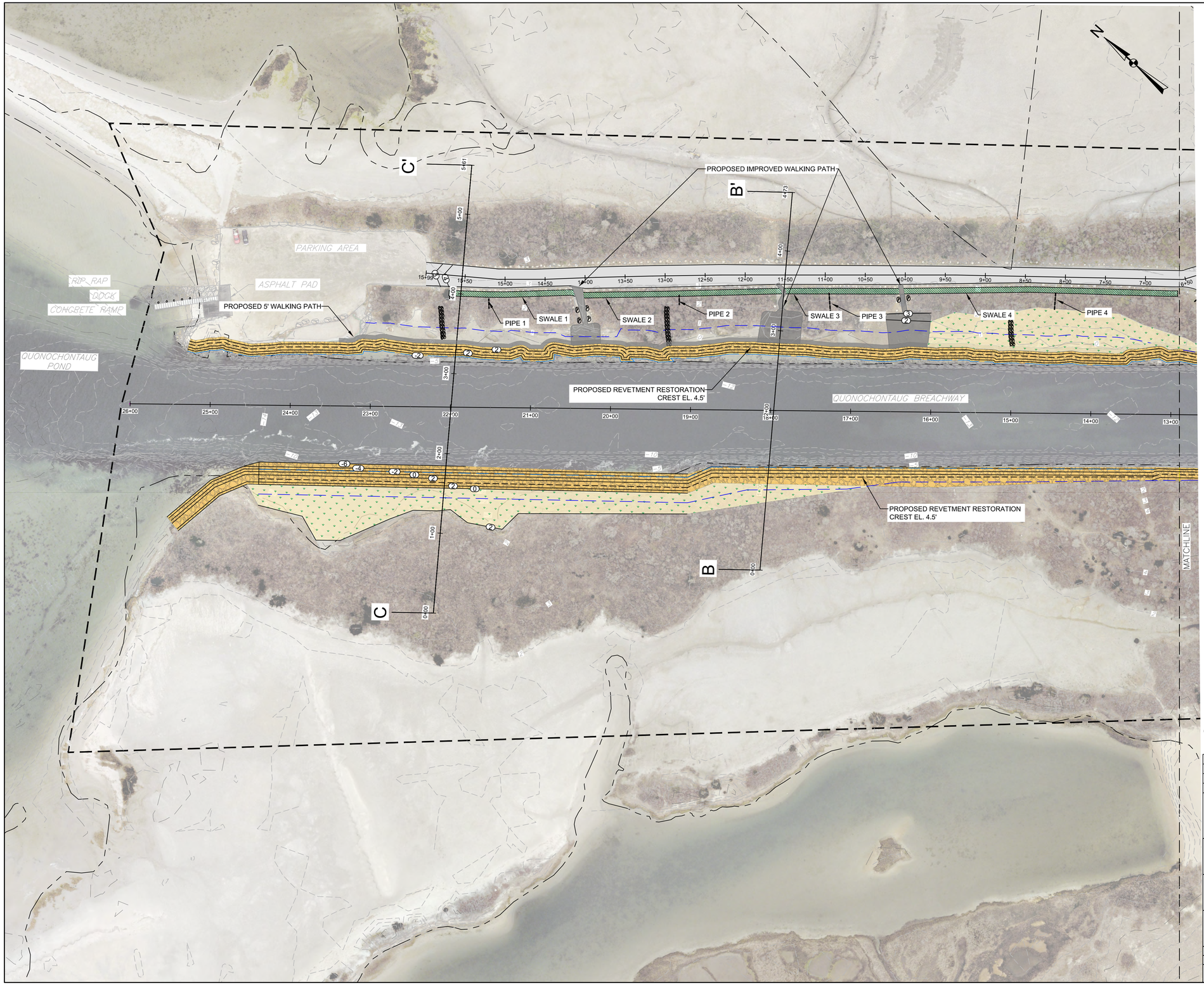
QUONOCHONTAUG BREACHWAY SITE ASSESMENT AND DESIGN FOR COASTAL RESILIENCY
CHARLESTOWN, RHODE ISLAND

PROPOSED CONDITIONS PLAN - SOUTH

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PROJ MGR: BW	REVIEWED BY: BW	CHECKED BY: RJM	DRAWING C-1
DESIGNED BY: JZ	DRAWN BY: CMC	SCALE: AS NOTED	
DATE: MARCH, 2022	PROJECT NO. 174739.00	REVISION NO. 0	SHEET NO.



GENERAL NOTES

1. ELEVATION DATA DEVELOPED FROM SURVEYS PERFORMED BY GZA PERSONNEL BETWEEN JANUARY 15TH AND 18TH, 2021.
2. MEAN TIDE VALUES WERE REFERENCED FROM NOAA TIDAL DISK BENCHMARK 845022.
3. ALL ELEVATIONS ARE IN NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88).

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED CONTOUR
- PROPERTY LINE
- APPROXIMATE PROJECT LIMITS
- MEAN HIGH WATER
- MEAN LOW WATER
- PROPOSED PIPE
- PROPOSED SWALE
- PROPOSED REVETMENT RESTORATION
- PROPOSED MARSH RESTORATION

0 30' 60' 120' 180'
SCALE IN FEET 1" = 60'

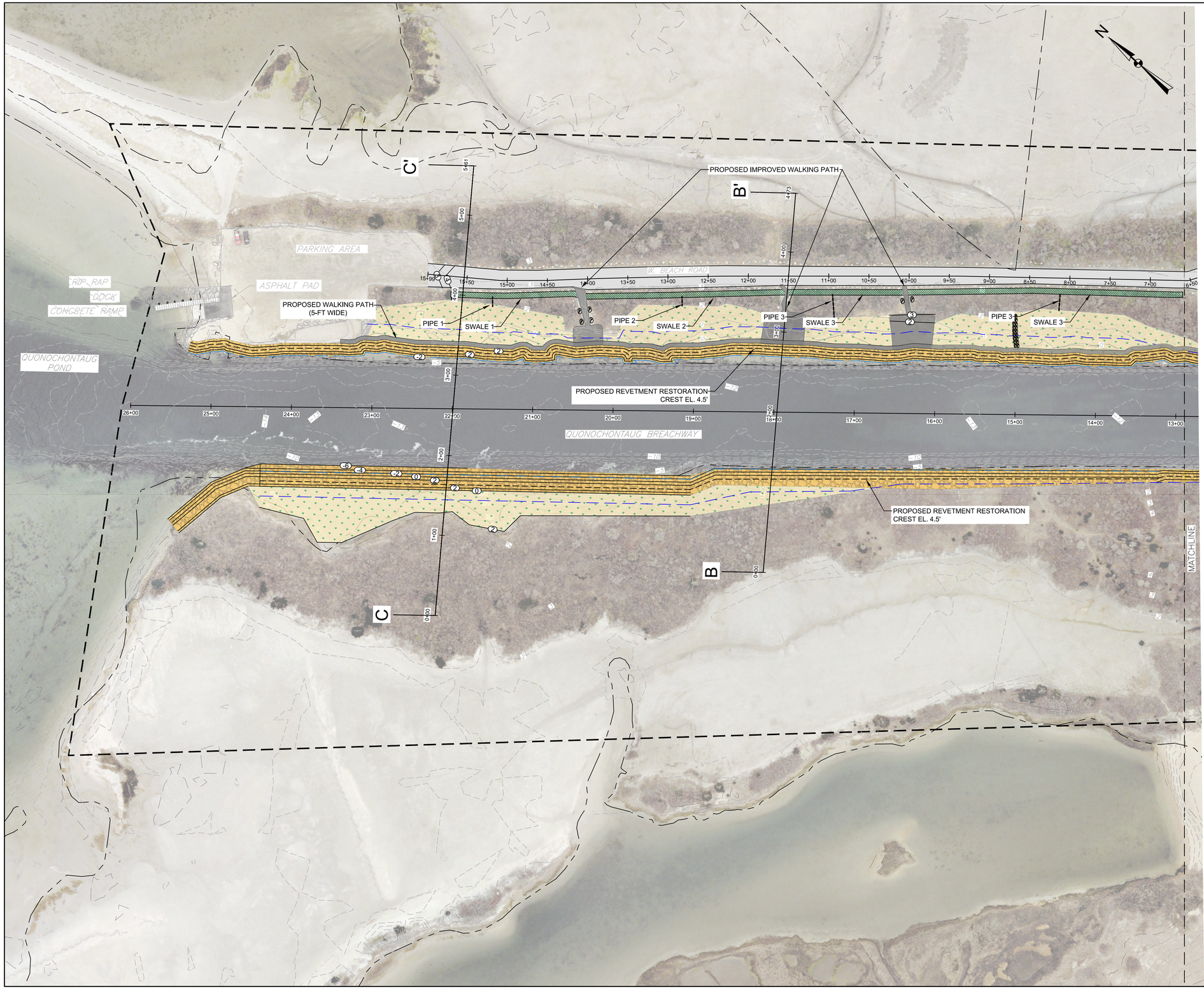
CONCEPT DRAWING
NOT FOR CONSTRUCTION

NO.	ISSUE/DESCRIPTION	BY	DATE

QUONOCHONTAUG BREACHWAY SITE ASSESMENT AND DESIGN FOR COASTAL RESILIENCY CHARLESTOWN, RHODE ISLAND

PROPOSED CONDITIONS PLAN - NORTH

PREPARED BY:		PREPARED FOR:	
GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT	
PROJ MGR: BW	REVIEWED BY: BW	CHECKED BY: RJM	DRAWING C-2
DESIGNED BY: JZ	DRAWN BY: CMC	SCALE: AS NOTED	
DATE: MARCH, 2022	PROJECT NO. 174739.00	REVISION NO. 0	SHEET NO.



GENERAL NOTES

1. ELEVATION DATA DEVELOPED FROM SURVEYS PERFORMED BY GZA PERSONNEL BETWEEN JANUARY 15TH AND 18TH, 2021.
2. MEAN TIDE VALUES WERE REFERENCED FROM NOAA TIDAL DISK BENCHMARK 845022.
3. ALL ELEVATIONS ARE IN NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88).
4. FOR PIPE AND SWALE INFORMATION SEE SHEET C-1.

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED CONTOUR
- PROPERTY LINE
- APPROXIMATE PROJECT LIMITS
- MEAN HIGH WATER
- MEAN LOW WATER
- PROPOSED PIPE
- PROPOSED SWALE
- PROPOSED REVETMENT RESTORATION
- PROPOSED MARSH RESTORATION

0 30' 60' 120' 180'
SCALE IN FEET 1" = 60'

CONCEPT DRAWING
NOT FOR CONSTRUCTION

NO.	ISSUE/DESCRIPTION	BY	DATE

QUONOCHONTAUG BREACHWAY SITE ASSESMENT AND DESIGN FOR COASTAL RESILIENCY
CHARLESTOWN, RHODE ISLAND

PROPOSED CONDITIONS PLAN - NORTH
ALTERNATIVE 2

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PROJ MGR: BW	REVIEWED BY: BW	CHECKED BY: RJM	DRAWING C-3
DESIGNED BY: JZ	DRAWN BY: CMC	SCALE: AS NOTED	
DATE: MARCH, 2022	PROJECT NO. 174739.00	REVISION NO. 0	SHEET NO.

Rhode Island Coastal and Estuary Habitat Restoration Fund
Full Proposal Form 2022/2023

****for planning projects please use Full Proposal Form for Planning Projects**

I. PROJECT SUMMARY

1. **Project Title:** Woonasquatucket River Streambank Stabilization – San Souci Drive, Providence

2. **Project Location and coordinates** *(include map)*: Woonasquatucket Riverbank along San Souci Drive in Providence, 41.817242889139585, -71.44291803530052 (see attached map)

3. **Project type** *(Design, Construction or Other)*: Design Part II

4. **If other, please specify:** N/A

5. **Habitat type** *(River System, Salt Marsh, Seagrass, Shellfish Bed, other)*: River System

6. **If other, please specify**: N/A

7. **Restoration technique** *(e.g. re-vegetation, tidal restoration, etc.)***:** Streambank stabilization, buffer restoration, and re-vegetation

8. **Total acreage or miles(river systems) of habitat to be restored, or project area planning unit size:** 0.161 Acres, 607 Linear Feet of Riverbank

9. **Project benefits:** 1) Streambank stabilization, 2) Improved streambank wildlife habitat, 3) Prevent slumping of Woonasquatucket River Greenway, San Souci Spur, just completed, into river.

10. **Project partners** *(organizations providing financial or other support to the project)***:** City of Providence Departments of Public Works and Planning & Development, United Way of Rhode Island, Councilman Oscar Vargas

11. **Is this is an ongoing project that has previously received funds from the CRMC Coastal and Estuarine Habitat Restoration Fund?** Yes **If yes, year(s) funding was awarded:**
    - 2019 – $16,900
    - 2022 – $50,000

II. PROJECT MANAGER CONTACT INFORMATION

1. **Name:** Alicia J. Lehrer, Executive Director

2. **Organization**: Woonasquatucket River Watershed Council (WRWC)

3. **Address**: 45 Eagle Street, Suite 202

4. **City:** Providence **5. State:** RI **6. Zip:** 02909-1082

7. **Phone**: 401-861-9046 **8. Email**: alehrer@wrwc.org

9. **Property Owner(s)**: City of Providence, United Way of Rhode Island

Applicant must document ownership of project site or permission to perform all proposed restoration, maintenance and monitoring activities *(include appropriate documentation).*

III. BUDGET SUMMARY

(List individuals or organizations providing financial or in-kind support to the project under Project Partners)

	Amount Requested from Trust Fund	**$50,000**
Matching Funds	**Project Partner(s)**	**Amount of Match**
In-Kind	Providence DPW Chief Engineer Staff Time	$5,000
Cash	Rhode Island Coastal and Estuary Habitat Restoration Trust Fund (CEHRT) (previous unexpended grants remainder)	$59,750
Cash	WRWC Project management Staff Time (from SNEP Pilot Watersheds Initiative)	$31,240
Cash	United Way of RI	$5,000
In-Kind	United Way of RI Staff Time	$5,000
Cash	Additional Funding Needed to Complete Design, Sources Pending	$40,500
	TOTAL PROJECT COST	$196,490

IV. PROPOSAL NARRATIVE (five pages maximum)

1. Justification and Purpose

Proposed Project: The Woonasquatucket River Watershed Council (WRWC) proposes to restore and stabilize the streambank along the San Souci Drive and the United Way of Rhode Island Property in urban Providence, RI. We plan to use a mix of both hard (rip rap) and softer (geogrid, coir fiber matting, and/or other plantable structures planted with native, wildlife friendly vegetation) bank stabilization methods. This project will include design, permitting and construction phases. Our goal is sustainable restoration and stabilization of the streambank. Both short-term and long-term outcomes include creating a flood and weather resistant stable streambank that improves habitat for pollinators and mammals. Over the long-term this project will prevent further bank slumping and degradation of the recently installed multi-use trail at the top of the bank.

Our goal is sustainable restoration and stabilization of the streambank. ***Both short-term and long-term outcomes*** include creating a flood and weather resistant stable streambank that improves habitat for pollinators and mammals. Over the long-term this project will prevent further bank slumping and degradation of the recently installed multi-use trail at the top of the bank.

Human Impacts: The river in this area of Providence is channelized due to dense industrial, commercial, and residential development along its banks. As climate change brings higher intensity and more frequent storms, erosion along this bend in the river has become worse over the last ten years. We need to stabilize it before it degrades completely.

Previous Restoration Activities: This section of the Woonasquatucket River benefitted from previous restoration activities concurrent with building the multi-use trail on San Souci Drive in 2019. We received previous CRMC Coastal and Estuarine Habitat Restoration Trust (CEHRT) Funds in the amount of $16,900 to purchase plants and soils and add pollinator habitat directly in and around the trail adjacent to the streambank and in the immediate vicinity such as on United Way of Rhode Island's (UWRI) property and a new walkway that includes green stormwater infrastructure between Westminster Street and San Souci Drive in Olneyville Square. Because the trail project did not cost as much as initially estimated, we did not need to use all the funds allocated at that time. We still have $9,750 remaining from those project funds and propose to use them to provide additional design, permitting and construction funds to the current project. We also received $50,000 in 2022 CRMC CEHRT for the first part of design for this project. To date, we developed a scope of work, a request for proposals (RFP), and have received proposals to proceed with the tasks up to and through Basis of Design. Our RFP and the winning bid are attached to this proposal.

2. Project Activities, Schedule and Work Plan

- December 2022 – January 2023: Review bids, select consultant, sign agreement.
- February – August 2023: Develop conceptual plans, meet with interagency (RIDEM/CRMC) Habitat Restoration Team to solicit input on concepts, finalize concepts, complete permit level plans and submit to RIDEM for permitting.
- September – November 2023: Acquire all necessary project permits
- December 2023 – February 2024: Complete final designs and bid documents.
- May 2024: Develop and advertise RFP for construction services. Note: WRWC plans to complete most of the construction with our own River Ranger team and volunteers. We will advertise only those services we cannot complete with existing staff, volunteers and equipment.
- June 2024: Review bids, select contractor, sign agreement.
- July – September 2024: Construct streambank stabilization/restoration as designed.
- October - November 2024 – Final Restoration
- December 2024 – Submit final project report.

3. Minimization of Adverse Impacts

The project site is urban and fairly disturbed. The project will entail very little in the way of disturbing existing sensitive species because there has been so much disturbance so frequently that sensitive species have not been able to establish recently. The fairly steep slope has suffered a great deal of erosion already and provides little habitat now. We will revegetate with the aim of providing additional mammal bird and pollinator habitat. We hope to stabilize the soil, at least in part, with physical measures including soil erosion blankets and stakes. However, given the extreme storm impacts along this area of the Woonasquatucket River, we expect that we will also need to add harder reinforcement measures including riprap.

4. Public Support

WRWC has worked in this project area for over 25 years. The multi-use trail on San Souci Drive, completed in 2019, was developed through our advocacy, partnership and funding efforts with strong community support. Through that effort, we met with all property owners surrounding the project area and have developed strong relationships with them. We also partnered closely with the City of Providence Departments of Planning and Development and Public Works as San Souci Drive is a Providence owned and operated street. Although we have had a long and productive relationship with United Way of Rhode Island, we deepened our relationship with them as Woonasquatucket River abutters and a property owner on San Souci Drive. Attached, you will find support letters from Providence City Council Member, Oscar Vargas who represents this part of Providence, Providence Chief Engineer, Craig Hoffman, who has

committed to be part of our project team, and United Way of Rhode Island (UWRI) COO, Robert Bush, another member of the project team and our connection to the work that will take place on UWRI property, and our partners at Providence Planning and Development.

5. Economic and Educational Benefits

Economic Benefits: The San Souci Greenway and its sister project, the San Souci connector, greatly enhance the aesthetics of Olneyville Square and provide a safe, beautiful alternative walking and biking connection to Olneyville Square. We have already heard from neighbors such as the Furgo, an energy company based in the Netherlands, that these features were the deciding factor in siting their Rhode Island branch in Olneyville.

Educational Benefits: The WRWC hosts K-12 environmental education programs as well as adult engagement programs such as our innovative Nuevas Voces/New Voices Program. We use all of our habitat restoration projects as learning tools for our students and adult cohorts. Our first Nuevas Voces cohort listed the visit to the San Souci Connector green infrastructure project as one of their best moments in the program because they could start to see how changes on the ground could impact climate related issues such as flooding and urban heat island. We will certainly use the San Souci streambank restoration project as learning opportunity and if possible, engage the public as volunteers in project installation. Finally, our River Ranger Program provides on the job training and education for youth surrounding the Woonasquatucket River Greenway. We work to train our full-time team in best practices to improve habitat and they in-turn train the young people that join the team as youth trainees. Our plan is to use this project as a training tool for the River Rangers while they install as much of the project as possible in house with professional oversight.

6. Climate Change and Coastal Resiliency

As described above, this project will stabilize the streambank and create sustainable wildlife habitat to directly mitigate the effects of and provide resilience in the face of increased flashy streamflows and flooding related to higher intensity and more frequent storms brought about by climate change.
This project will have direct impacts on resilience of habitat to climate change. It will improve streambank habitat resilience to increased storm flows and protect migratory fish spawning habitat that can make up for a other coastal habitat losses due to climate change.

We considered the present and future impacts of climate change during the project planning and design phases. As a result, the project is designed to withstand stronger and more frequent storms and rainfall amounts. It is also designed to improve avian, mammal and pollinator habitat along this stretch of the Woonasquatucket River.

7. Environmental Justice

This project takes place in and will benefit an environmental justice community. The proposed project takes place in the Olneyville neighborhood of Providence in an area identified by the Narragansett Bay Estuary Program as their highest environmental justice priority area: Priority Index 4 – 94.9% non-white and/or Latinx, 47.3% low income, 41.5% limited English, 47.1% less than high school education level.

This area is also listed as between the 90th and 96th percentile in EPA Region 1 for all environmental justice indices using EPA's EJ Screen tool: https://ejscreen.epa.gov/mapper/ejscreen_SOE.aspx

8. Planning Consistency and Restoration Priority

This project is consistent with CRMC's restoration priorities of enhancing habitats' resiliency to climate change on projects located within Environmental Justice communities and/or that address Environmental Justice Concerns. We have discussed both these priorities in sections 6 and 7 above.

9. Species of Concern

The project will help assure the success of fish runs which can lead to an increase in breeding populations of birds on the Woonasquatucket. Some of the species of concern listed in the above report, such as black crowned night heron and the hooded merganser are already observed on the Woonasquatucket.

10. Permitting:

This project will require a Rhode Island Department of Environmental Management (RIDEM) Freshwater Wetlands Permit, will likely require a RIDEM Water Quality Certification and a US Army Corps of Engineers Permit. We plan to apply for all once we have reached the 60% design phase.

11. Capacity of Lead Organization

The Woonasquatucket River Watershed Council, a 501(c)(3) organization creates positive environmental, social and economic change by revitalizing the Woonasquatucket River, its Greenway and its communities. The WRWC is actively involved in and plays a critical role in ongoing restoration efforts in the watershed including the initiative to restore fish runs to Woonasquatucket; restore the Centredale Manor Superfund site; wetland restoration efforts such as the Deerfield Park and Department of Public Works projects in Smithfield; and riparian buffer restoration projects such as those we successfully completed at Cutler Brook in Glocester, and the Stillwater Brook in Smithfield. The WRWC brings local knowledge and the ability to coordinate funding and partners to facilitate project success.

The WRWC has a long history of coordinating project partners on successful fish passage projects under the leadership of Alicia Lehrer, WRWC's Executive Director. To date, we have successfully completed five fish passage projects with deep appreciation to the Coastal and Environmental Habitat Restoration Trust for ongoing support to complete them all. Lisa Aurecchia, WRWC's Director of Projects, has successfully coordinated and overseen project development, RFP development, bid management, and construction for dozens of projects throughout the Woonasquatucket Watershed including five green infrastructure projects completed in the last three years. Resumes for Alicia Lehrer and Lisa Aurecchia available upon request.

V. SUSTAINABILITY (one page maximum)

1. Maintenance

We cannot fully address project maintenance until designs have been completed. However, we intend to design a project that will stand the test of time and extreme flooding conditions for at least 25 years.

Should we design any hard armoring of the toe of the streambank, as we suspect we will need to, this will require little or no maintenance. However, the WRWC River Rangers will inspect the entire project at least monthly during the growing season every year for at least three years following construction.

For other stabilization and planting methods that ultimately become part of this project, WRWC commits to monthly maintenance for at least three years including the following:

- Inspection of all elements of the projects
- Trash removal
- Invasive removal
- Watering
- Replacing vegetation if/when necessary
- Communicating with Providence DPW if any issues arise that will affect the San Souci multi-use trail

As the state designated steward of the Woonasquatucket River Watershed and the Woonasquatucket Greenway, WRWC is committed to long-term maintenance of all our projects. We continually pursue opportunities for long-term maintenance funding and employ a full-time maintenance crew to care for all of our projects and resources. We are currently learning to use GPS-based maintenance application that will help us track projects, their specifications for function and operation, and regular maintenance activities so that as our team grows and changes, we have seamless transfer of effective maintenance.

2. External Factors

Climate change is already causing increased frequency and intensity of storms that have led to the issues we are addressing with this project, especially, the destabilization and slumping of the streambank into the river. The vegetated streambank will need ongoing maintenance as described above and extremely intense storms could compromise the project. We know that this is the case and therefore, our plan for ongoing maintenance will assure project success over the long term.

Sea level rise is not expected to affect this project as sea level rise should not affect any areas upstream of Rising Sun Mills on the Woonasquatucket.

VI. EVALUATING PROJECT SUCCESS (one page maximum)

1. Performance Measures

Success of this project will be measured through annual monitoring of fish return through the fish ladder at Rising Sun Mills (see monitoring plan below). WRWC volunteers, under the supervision of RIDEM F&W, monitor annual migratory fish return to the Woonasquatucket at the first fish ladder, Rising Sun Mills. Over 40 volunteers participate in monitoring annually. The WRWC, in partnership with RIDEM F&W, train volunteers in monitoring fish return and recording data.

Additionally, as this project has an educational component as well as a restoration component, WRWC will track the number of youth and adults, especially from the Olneyville neighborhood, that join WRWC educational programs through tours of the restored riverbank.

2. Monitoring Plan

Rangers maintain the site and monitor for slumping and erosion on a weekly basis. WRWC volunteers monitor fish return annually at the Rising Sun Mills Fish Ladder using RIDEM F&W monitoring protocol.

Volunteers collect direct counts at least twice daily from the middle of March through the middle of May annually. They record data in a notebook stored in a lockbox at the site. The data are analyzed by RIDEM F&W. The WRWC reports results through our Constant Contact email list, on our website, in our newsletter and directly to project partners.

Since 2010, over 40 volunteers have collected fish return data at Rising Sun Mills annually. The WRWC will assure that this practice continues in perpetuity by coordinating with RIDEM F&W, recruiting, training and setting up a monitoring calendar annually. As more habitat becomes available, we expect to see an increase in fish return at Rising Sun annually.

Additionally, the WRWC began a new volunteer monitoring program in 2014 that we continue annually. Volunteers collect fish community data annually through an electrofishing program at two sites on the Woonasquatucket. The upstream site is located on a section of river next to Whipple Field in Smithfield, a site we consider to be a fairly pristine riverine site. The second site is just downstream of Rising Sun Mills Dam in Providence, our urban site. Volunteers inventory the fish community once annually at each site on a 100’ stretch of the river. This program allows us to establish a baseline and monitor changes in the fish community. We expect that our fish passage projects will strengthen the fish community diversity and population at our downstream site because all river fish will have a greater habitat range as a result of our fish passage projects. Our protocol for this program was developed with the assistance of Alan Libby, state Fishery Biologist.

Finally, we finalized our six year grant agreement through the Southeast New England Program (SNEP) Pilot Watersheds Initiative, so we know we will have at least four years of support after construction for all our watershed restoration activities. Maintenance will include monthly inspections during the growing season for three years as well as invasive removal and plant replacement if necessary. Should the bank stabilization show signs of failing, the WRWC team will work with partners to correct any issues expediently.

VII. PROJECT BUDGET TEMPLATE

BUDGET CATEGORY	CRMC REQUEST	MATCH	MATCH PENDING OR SECURED? (select one)	SOURCE OF MATCH	TOTAL
RFP Development / Consultant Selection (completed)		$2,060 $1,000	SECURED SECURED	SNEP Pilot Watersheds In-Kind DPW Time	$3,060
Consultant Project Mgmt. WRWC Project Mgmt.		$6,000 $6,225	SECURED SECURED	Previous CEHRT Grant + SNEP Pilot Watersheds Previous CEHRT Grant	$12,225
Project Team Mtgs – Cons. Project Team Mtgs – WRWC Project Team Mtgs - Parnters		$6,000 $5,000 $9,000	SECURED SECURED SECURED	SNEP Pilot Watersheds UWRI Funds In-Kind DPW & UWRI Time	$20,000
Existing Conditions Assessment		$20,600 $860	SECURED SECURED	Previous CEHRT Grant SNEP Pilot Watersheds	$21,460
Alternatives Analysis		$17,100 860	SECURED SECURED	Previous CEHRT Grant SNEP Pilot Watersheds	$17,960
Habitat Restoration Team Meeting		$2,000 $1,350	SECURED SECURED	Previous CEHRT Grant SNEP Pilot Watersheds	$3,350
Basis of Design		$6,000 $1,265	SECURED SECURED	Previous CEHRT Grant SNEP Pilot Watersheds	$7,265
Phase II Project Mgmt	$8,200	$6,225	SECURED	SNEP Pilot Watersheds	$14,425
Phase II Team Meetings	$6,600	$5,000	SECURED	SNEP Pilot Watersheds	$11,600
60% Design Submittal	$35,200	$5,445	SECURED	SNEP Pilot Watersheds	$46,645
SUBTOTAL CURRENT DESIGN PARTS 1 & 2 REQUEST	$50,000	$92,000		**TOTAL CURRENT PROJECT COST**	$142,000
FUTURE WORK PLANNED/COSTS					
Permitting	$34,000	$1,000	PENDING	Future Match Sources	$35,000
Final Engineering (90% & 100%), specs and bid package	$6,500	$3,000	PENDING	Future Match Sources	$9,500
Bid Administration		$5,000	PENDING	Future Match Sources	$5,000
Construction Oversight / Admin		$40,000	PENDING	Future Match Sources	$40,000
Construction		TBD			
Maintenance		$30,000	PENDING	SNEP Pilot Watershed	$30,000
FUTURE TOTAL	**TBD**	**TBD**		**TOTAL PROJECT COST**	**TBD**

VIII. BUDGET NARRATIVE (one page maximum)

Phase I Design: Through Basis of Design Step

RFP Development & Consultant Selection: $3,060

- No New CRMC Funds Requested
- WRWC Staff Time (paid through SNEP Pilot Watersheds grant): $3,060
  - Alicia Lehrer, Executive Director, 4 hours @ $85/hour (includes fringe) = $340
  - Lisa Aurecchia, Director of Projects, 8 hours @ $65/hour (includes fringe) = $520
  - Mark Pereira, Civil Engineer, 16 hours @ $75/hour (includes fringe) = $1,200
- Providence DPW Time (in-kind), 10 hours @ $100/hour (including fringe) = $1,000

Project Management: $12,225

- No New CRMC Funds Requested
- Previously granted CRMC funds for Consultant Staff Time: $6,000
- WRWC Staff Time (paid through previously granted CRMC fund - $2,050, and SNEP Pilot Watersheds grant - $4,175: $6,225
  - Alicia Lehrer, Executive Director, 15 hours @ $85/hour (includes fringe) = $ 1,275
  - Lisa Aurecchia, Director of Projects, 30 hours @ $65/hour (includes fringe) = $1,950
  - Mark Pereira, Civil Engineer, 40 hours @ $75/hour (includes fringe) = $3,000

Project Team Meetings: $20,000

- No New CRMC Funds Requested
- Previously granted CRMC funds for Consultant Staff Time: $6,000
- WRWC Staff Time (paid through UWRI Funds): $5,000
  - Alicia Lehrer, Executive Director, 8.2 hours @ $85/hour (includes fringe) = $700
  - Lisa Aurecchia, Director of Projects, 20 hours @ $65/hour (includes fringe) = $1,300
  - Mark Pereira, Civil Engineer, 40 hours @ $75/hour (includes fringe) = $3,000
- Providence DPW Time (in-kind), 40 hours @ $100/hour (including fringe) = $4,000
- UWRI Time (in-kind), 50 hours @ $100/hour (including fringe) = $5,000

Existing Conditions Assessment: $21,460

- No New CRMC Funds Requested
- Previously granted CRMC funds for Consultant Staff Time: $20,600
- WRWC Staff Time (paid through SNEP Pilot Watersheds grant): $860
  - Lisa Aurecchia, Director of Projects, 4 hours @ $65/hour (includes fringe) = $260
  - Mark Pereira, Civil Engineer, 8 hours @ $75/hour (includes fringe) = $600

Alternatives Analysis: $17,960

- No New CRMC Funds Requested
- Previously granted CRMC funds for Consultant Staff Time: $17,100
- WRWC Staff Time (paid through SNEP Pilot Watersheds grant): $860
  - Lisa Aurecchia, Director of Projects, 4 hours @ $65/hour (includes fringe) = $260
  - Mark Pereira, Civil Engineer, 8 hours @ $75/hour (includes fringe) = $600

Habitat Restoration Team Meeting: $3,350

- No New CRMC Funds Requested
- Previously granted CRMC funds for Consultant Staff Time: $2,000
- WRWC Staff Time (paid through SNEP Pilot Watersheds grant): $1,350
  - Alicia Lehrer, Executive Director, 5 hours @ $85/hour (includes fringe) = $425
  - Lisa Aurecchia, Director of Projects, 5 hours @ $65/hour (includes fringe) = $325
  - Mark Pereira, Civil Engineer, 8 hours @ $75/hour (includes fringe) = $600

Basis of Design: $7,265

- No New CRMC Funds Requested
- Previously granted CRMC funds for Consultant Staff Time: $6,000
- WRWC Staff Time (paid through SNEP Pilot Watersheds grant): $1,265
  - Alicia Lehrer, Executive Director, 3 hours @ $85/hour (includes fringe) = $255
  - Lisa Aurecchia, Director of Projects, 4 hours @ $65/hour (includes fringe) = $260
  - Mark Pereira, Civil Engineer, 10 hours @ $75/hour (includes fringe) = $750

Phase II Design – Through 60% Design Submittal

Project Management: $14,225

- CRMC Funds Requested for Consultant Staff Time: $8,200
- WRWC Staff Time (paid through SNEP Pilot Watersheds grant): $6,225
  - Alicia Lehrer, Executive Director, 15 hours @ $85/hour (includes fringe) = $ 1,275
  - Lisa Aurecchia, Director of Projects, 30 hours @ $65/hour (includes fringe) = $1,950
  - Mark Pereira, Civil Engineer, 40 hours @ $75/hour (includes fringe) = $3,000

Phase II Project Team Meetings: $20,000

- CRMC Funds Requested for Consultant Staff Time: $6,600
- WRWC Staff Time (paid through SNEP Pilot Watershed Funds): $5,000
  - Alicia Lehrer, Executive Director, 8.2 hours @ $85/hour (includes fringe) = $700
  - Lisa Aurecchia, Director of Projects, 20 hours @ $65/hour (includes fringe) = $1,300
  - Mark Pereira, Civil Engineer, 40 hours @ $75/hour (includes fringe) = $3,000
- Providence DPW Time (in-kind), 40 hours @ $100/hour (including fringe) = $4,000

UWRI Time (in-kind), 50 hours @ $100/hour (including fringe) = $5,000

60% Design Submittal: $40,645

- CRMC Funds Requested for Consultant Staff Time: $35,200
- Match (paid through SNEP Pilot Watershed Funds): $3,300
- WRWC Staff Time (paid through SNEP Pilot Watersheds grant): $2,145
  - Alicia Lehrer, Executive Director, 5 hours @ $85/hour (includes fringe) = $425
  - Lisa Aurecchia, Director of Projects, 8 hours @ $65/hour (includes fringe) = $520
  - Mark Pereira, Civil Engineer, 16 hours @ $75/hour (includes fringe) = $1,200

IX. ADDITIONAL MATERIALS

Please include the following with your application:

__X__ Site and Locus Maps

__X__ Ground-level photographs of existing site conditions

__X__ Aerial photographs, if available

__X__ Preliminary design drawings, maps or engineering plans, if available (preliminary project cost estimates done by San Souci Greenway consultant)

___ Pertinent physical, ecological, biological, and cultural / historical survey data

__X__ Letters of support (City of Providence Departments of Planning and Public Works, United Way of Rhode Island, Councilman Oscar Vargas)

AUTHORIZED SIGNATURE

AUTHORIZED AGENT OF LEAD ORGANIZATION

Alicia J. Lehrer

Signature

January 27, 2023

Date

Return your completed proposal by 4:00 p.m. on **January 27, 2023** to:

Caitlin Chaffee
NBNERR
RI Dept. of Environmental Management
235 Promenade Street
Providence, RI 02908

caitlin.chaffee@dem.ri.gov

Applicants are required to submit one (1) signed hard copy of the proposal form and one (1) electronic copy in Adobe PDF format. **Please submit electronic copy as a **SINGLE PDF FILE** containing all application materials.**

Contact Caitlin Chaffee at **401-222-4700 xt. 277-4417** with any questions.

CRMC
COASTAL RESOURCES MANAGEMENT COUNCIL

Appendix

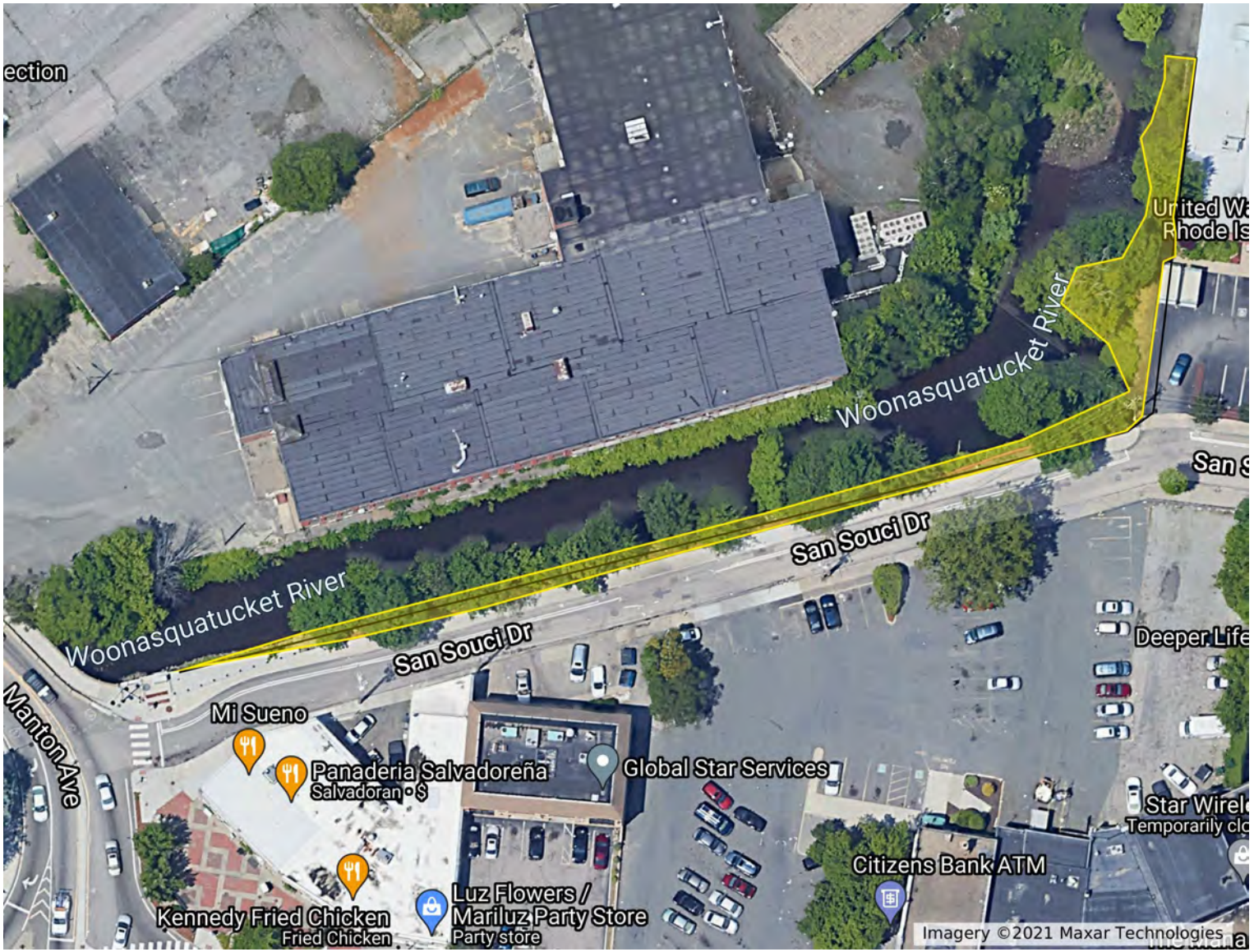
Attachments

San Souci Streambank Restoration, Site & Locus Map & Aerial Photo

Streambank Restoration Area

Streambank Restoration Area

Linear Feet of Riverbank



Ground Level Photos of Existing Site Conditions

Appendix - Attachments

Rhode Island Coastal and Estuary Habitat Restoration Fund
Full Proposal Form for Planning Projects 2022/2023

****for design or construction projects please use Full Proposal Form**

I. PROJECT SUMMARY

1. **Project Title:**
   Plant species diversity in coastal wetlands: capacity-building for landscape-level planning, assessment, monitoring, and management.

2. **Project Location and coordinates** *(include map)*:
   At least 25 coastal wetland sites focused primarily along the Rhode Island south coast with selected sites in the mid- and upper bay (see map).

3. **Habitat type** *(River System, Salt Marsh, Seagrass, Shellfish Bed, other)*:
   Coastal wetlands: salt marsh, brackish marsh, coastal lagoon shore, and rare coastal freshwater wetlands such as coastal plain pond shore, tidal freshwater marsh, and sea level fen.

4. **If other, please specify**:

5. **Targeted restoration technique** *(e.g. re-vegetation, tidal restoration, etc.)***:**

6. **Potential future benefits resulting from proposed planning project:**
   Although the viability of plants and plant communities is one of the primary targets of coastal wetland restorations, and although plant inventories are part of virtually all monitoring, assessment, and restoration activities, there is no place where plant inventories are collated and restoration planners and practitioners can go to access this information. This project will provide such a resource. It will also be a big step forward in developing a biodiversity database Rhode Island desperately needs to manage biodiversity data on rare species, invasive species, and other species of interest. Having a plant database to work from and contribute to is also a strong incentive for the public to become more involved in future montitoring. This project is part of the Survey's long term commitment to engage with the Narragansett Indian Tribe and will help make future collaborations happen.

7. **Project partners** *(organizations providing financial or other support to the project)***:**
   Narragansett Indian Tribe
   RI Conservation Stewardship Collaborative

8. **Is this is an ongoing project that has previously received funds from the CRMC Coastal and Estuarine Habitat Restoration Fund?** No **If yes, year(s) funding was awarded:**

II. PROJECT MANAGER CONTACT INFORMATION

1. **Name:** David Gregg, Ph.D., Executive Director

2. **Organization**: Rhode Island Natural History Survey

3. **Address:**

14 East Farm Rd., PO Box 1858

4. City: Kingston **5. State:** RI **6. Zip:** 02881

7. Phone: 401-874-5800 **8. Email:** dgregg@rinhs.org

9. Property Owner(s):

N/A

III. BUDGET SUMMARY

(List individuals or organizations providing financial or in-kind support to the project under Project Partners)

	Amount Requested from Trust Fund	**$31,820**
Matching Funds	**Project Partner(s)**	**Amount of Match**
organize & run BORIIS2 user group	RI Cons. Stewardship Collaborative	$6,000
data clerk time for adaptive management & QA/QC	RI Natural History Survey (cash/in-kind)	$4,840
	TOTAL PROJECT COST	**$42,660**

IV. PROPOSAL NARRATIVE

1. Justification and Purpose

Briefly describe the proposed planning project. What questions does it propose to answer? What are the restoration goals and anticipated long-term and short-term outcomes. Describe the human impacts and previous restoration activities within the proposed study area. If the project area includes multiple impacted sites, please describe the impacts and previous restoration activities at each.

Among the over 10,000 macroscopic species of life in Rhode Island, approximately 1,980 are vascular plants. Typically, biodiversity data, especially plant data such as species lists, cover and patch metrics, and reproductive status, are collected from wetland sites during monitoring and restoration projects. These data are incorporated as an appendix in project reports that are primarily read for other reasons, and so the best data on wetland plants remain buried in project reports, sometimes in electronic form but often printed on paper in very small numbers with narrow distribution.

If restoration on a site-by-site basis were satisfactory, using plant data directly from each site's prior written reports would suffice. However, the RI Coastal Wetland Restoration Strategy (p 21) emphasizes that "ecological restoration cannot effectively be carried out by simply improving ecological conditions on a site by site basis, and that ecological interventions should be pursued on broader physical and conceptual scales." To be useful at regional scale, prior studies of isolated sites have to be known about, found, and collated, all with expert knowledge to account for different times, different methodologies and nomenclature, and different data formats.

In the last 30 years, substantial investments have been made to collect coastal wetland plant data for many of Rhode Island's most important coastal wetlands. These inventories document all or most vascular plant species, not just rare, invasive, indicator or keystone species. Many inventories were related to habitat restorations or monitoring funded by, among others, EPA grants through RIDEM

and SNEP, CERHTF, Sandy recovery funds, state bonds, and private funds. Other initiatives include BioBlitzes, university research, and rare species conservation projects. It is relatively easy to point to detailed plant species inventories locked away in reports from over 30 coastal wetland sites around RI from upper and middle Narragansett Bay and from the south coast. For example, validation of wetland program methodologies created comprehensive plant inventories at sites at three coastal lagoons, documenting 131 plant species total and averaging nearly 100 species per site. Rhode Island BioBlitz has resulted in comprehensive inventories at seven sites that include coastal wetlands, with an average species richness of over 300. In the early 1990s, Rhode Island Wild Plant Society surveys inventoried 4 coastal wetland sites, averaging 99 species per site.

With inventories largely isolated within reports that are too often scarcely available, few if any inventories contribute to our knowledge of status and trends of coastal wetland biodiversity at a scale beyond their individual project boundaries or are available for restoration planning. Which coastal wetlands have the greatest plant diversity? Which are degrading fastest? Do these tend to be in a certain part of the coast? Which restoration strategies have most closely approximated natural plant communities? Are pollinator trends related to status and trends in plant communities? This tool would enable regional analyses based on biota, not just physical parameters and remotely sensed surrogate data. Through this project, a resource is created where those engaged in coastal wetland restoration, monitoring, and assessment can go to get the best available plant diversity data, comparable from site to site across the state.

Ecosystem services and functions provided by coastal wetlands arise wholly or in part from ecological integrity, ultimately from biological productivity and diversity, particularly among plants. Many wetland restoration and intervention methods, even methods targeting structural characteristics such as tidal flow and drainage enhancement, are truly aimed at supporting or restoring biodiversity and ecological integrity primarily rooted (literally) among the plants. Funding is sought to advance an existing biodiversity database development project at the Natural History Survey through the prototype phase and to test it using "orphan" plant data from coastal wetland sites, creating an expertly curated index to plant data that will contribute to decision making about condition and trend, restoration priorities, or management outcomes at coastal wetland sites and at a landscape scale.

2. Project Activities, Schedule and Work Plan

Describe the planned project activities, and explain how each activity will help to plan for restoration of ecosystem functions. List specific project activities and when they will occur (month and year). Indicate when annual and final project reports will be submitted.

Project activities: a) finish the next generation of biodiversity database, called BORIIS2 (Biota of Rhode Island Inventory System) currently well along in development at RINHS ; b) capture and clean data from existing coastal wetland plant inventories; c) ingest that data into the database; and d) test analytical and output capabilities by producing a Coastal Wetland Plant Atlas with species lists and metrics and sample maps. Research on data sources, data formatting/cleaning, and data entry and validation will be carried out by Survey staff, contract botanists, volunteers, and a paid intern recruited from the Narragansett Indian Tribe by the tribal natural resources director. These inputs and a series of data manipulations will test the developing database and help guide creation of queries and reports. Stakeholder involvement in development and feedback will be through a BORIIS users group. The creation and early work of that group is supported by a $6,000 grant from the RI Conservation Stewardship Collaborative explicitly as a match for the CEHRTF grant.

The Survey built an all-taxa biodiversity database (the Biota of Rhode Island Inventory System or "BORIIS"), in the early 2000s to document species' presence in Rhode Island as a whole and index

information sources on that diversity. BORIIS contains over 48,000 plant observations totaling over 2,200 plant species including, for example, 96 records for *Myrica pensylvanica*, 12 for *Opuntia humifusa*, 20 for *Spartina cynosuroides*, and 22 for *Sabatia stellaris*. Many site inventories entered into BORIIS, however, were attributed only to town, not site, and those need to be redone. For largely technical reasons, BORIIS has limited useability, is not generally accessible, and ceased to be updated in 2007-08.

A successor database, BORIIS2, designed to be simpler and to avoid problems that held back the first BORIIS has been under development at RINHS for over two years. It is based around the concept of the "Observation" which is a combination of species, observer, date, location, and evidence, and is conceived as an index of species observations to answer the question, "If, when, and where did/does such-and-such species live in Rhode Island and how do we know?" A normalized schema with approximately 35 tables is complete and has been reviewed by internal and external database experts. BORIIS2 takes maximum advantage of existing BORIIS1 tables to speed up implementation. Developed in MS Access for implementation in SQL Server, final platform is not decided and MS Power Platform is being investigated as more user friendly.

Deliverables: Project deliverables include a) regular grant reporting and database technical information covering contracting, development progress, and a plan for further work and b) a Coastal Wetland Plant Atlas giving the number of datasets entered, temporal and spatial coverage, number of sites and species represented, and preliminary assessment of the most significant gaps plus plant lists and sample maps.

Timeline:

Spring 2023 Convene BORIIS2 user group, initial informational meeting, in subsequent meetings gather information on users' needs and use-cases

Summer 2023 Contractor produces a single-taxon implementation of the BORIIS2 design for testing

Summer 2023 Tribal intern and Survey data clerk identify inventories, concatenate plant lists, and standardize taxonomy and nomenclature to the current Native Plant Trust Tracheophyte Checklist

Fall 2023 Adapt database implementation as indicated and ingest plant lists that don't require additional work

Fall 2023 User group assesses test implementation and provides feedback

Winter 2023-24 Adapt database implementation as indicated; enter plant data that required additional work; prepare deliverable reports & Coastal Wetland Plant Atlas; write plan for further implementation; Wrap-up by May 1, 2024

3. Coordination and Public Support

How will the project lead organization coordinate with other stakeholder groups, and which groups will be included? Describe planned or completed community / stakeholder education and outreach efforts.

The Survey is a member-supported nonprofit widely known for biodiversity inventory, data management, and outreach. It is overseen by a volunteer board of 18 representing many of the major science, conservation, and education institutions in Rhode Island. The Survey's 1998 book *Vascular Flora of Rhode Island* and its BORIIS1 database were both developed substantially if not predominantly by volunteers. Volunteers provided major input into the BORIIS2 plan. For nearly a year, the Narragansett Indian Tribe and the Survey have been exploring opportunities for mutual assistance and greater long term cooperation, and we will partner on BioBlitz 2023 in June. Tribal herbalist and Natural Resource Department Director Dinalyn Spears supports this plant project as helping bring together academic field botany and data management with traditional ecological knowledge, and she will recruit if possible a paid intern from the tribe to take a major paid role in this

project. The RI Conservation Stewardship Collaborative, a fund of the Rhode Island Foundation, provided a $6,000 grant to support the creation of the user group to help steer BORIIS2 development and this project. RINHS is also soliciting private contributions specifically for the BORIIS2 project.

In terms of educational benefits and community engagement, checklists encourage knowledgeable members of the community to participate in monitoring and assessment. Social value is created when people find species not previously found, compile the largest list of a taxon, or seek to learn about species on a checklist. Active, conspicuous data projects attract teachers and students looking for applied or hands-on educational experiences, and they attract knowledgeable members of the general community who want their skills and efforts to be appreciated and to make a difference to science and/or conservation.

4. Planning Consistency and Restoration Priority

Is the proposed project consistent with the goals of a local, state or regional planning initiative? Please specify initiative and explain (see CRMC website for guidance). Does the proposed project involve a state, regional or federal priority habitat restoration need or special consideration? Please specify and explain (see CRMC website for guidance).

Up-to-date, reliable, accessible biodiversity data increase predictability of permitting and focus regulatory efforts on areas of real concern rather than having to be broadly preemptive. Such data also help direct limited acquisition, restoration, and stewardship resources most effectively. The state has identified a new biodiversity database as a priority for the Heritage program and it will also contribute to the 2025 revision and subsequent implementation of the RI Wildlife Action Plan.

5. Species of Concern

Does the planning project address threats to wildlife species listed as federally or state endangered, threatened, or species of concern within Rhode Island? Please specify which species will benefit and how. For a list of species, see the Rhode Island National Heritage Program's listing of animals at: http://ww.rinhs.org/wp-content/uploads/ri_rare_animals_2006.pdf or *a listing of plants at:* http://www.rinhs.org/wp-content/uploads/ri_rare_plants_2007.pdf

When managing biodiversity data, there are risks to the privacy of landowners and data gatherers/contributors and risk of exposing locations of species sensitive to disturbance and/or poaching. During database development, datasets are going to have to be widely distributed and extensively massaged, and this is one reason large datasets of common, widespread, or low risk plants are particularly well suited to development of BORIIS2. To protect landowners and data contributors, only plant lists from publicly released reports will be used during this stage of development, and to protect sensitive species, data on rare species will be held back and incorporated into the database once security and operating procedures are implemented.

6. Climate Change and Coastal Resiliency

How will present and future impacts of climate change be considered during the project planning and design phases? What impact will the final project have on resilience of coastal or estuarine habitat to climate change?

In RI, coastal wetlands, salt and fresh, are perhaps the most vulnerable natural community types to climate change. The general condition of these wetlands in RI is becoming better documented with the emergence of the Wetland Program. Status and trends of species biodiversity on a site-by-site basis could be captured in Tier 3 monitoring activities such as FQA, but habitat functions that generate

species biodiversity, and especially the collation of site data for assessment of landscape-scale trends in species biodiversity and habitat function are limited to certain flagship species such as salt marsh sparrows or keystone species such as eelgrass. Wider species inventory is one essential component for effective, efficient coastal restoration, monitoring, and assessment. Plants are literally the root of all the complex ecologies in coastal wetland sites and the most important taxon to understand. Coordinating and indexing plant diversity data across sites is an essential capacity to have for understanding status and trends at scales larger than any one site's boundaries.

7. Environmental Justice

Will the proposed project take place within or otherwise benefit environmental justice "priority areas" as defined by the Narragansett Bay Estuary Program's analysis of Environmental Justice in the Narragansett Bay Region? Does the proposed project incorporate Environmental Justice concerns as defined by the US EPA's Guidance on Environmental Justice and Equitable Development?

At a fundamental level, this project is about making valuable data accessible where they have heretofore been restricted to those ordained into academic practices, such as archival research, and removed from potential users by practical barriers including distance. An academic of the European tradition would have time to track down in libraries and archives the kinds of reports this project will ingest, and have training and experience in how to approach and use collections-holding institutions. As the BORIIS2 database matures, it will lower these barriers. Data access increases transparency of planning and policy processes and is essential for independent environmental monitoring and assessment. This project is not focused on developing public access *per se* but on setting up a resource such that public access can be built for it in the near future.

The Narragansett Indian Tribe is one of the underserved communities for which a project focused on coastal wetlands is most relevant, and RINHS, as a part of a deliberate effort to expand its diversity and inclusivity, is actively working with the tribe's office of Community Planning and Natural Resources to develop a long term relationship and two-way exchange. To that end, the Survey and the Tribe are co-hosting the Rhode Island BioBlitz 2023 on tribal land in Charlestown. For the Narragansett people, natural resources of the shore and coastal wetlands were culturally and economically important in the past and remain so today. Through the RINHS initiative, the non-Native community could benefit from whatever indigenous knowledge and insights tribal members may want to share, and an intern's experience with scientific modes of inquiry and data management may be valuable to him/her individually as well as to the tribe. A successful internship would help reinforce the Survey's ongoing bridge building efforts and hopefully will be a pilot for future internships. The project budget includes money for an intern/assistant who will be recruited by the tribe's Natural Resources office from among tribal members.

8. Permitting

List any federal, state or local permits required to complete the project and the permit application status for each.

N/A

9. Capacity of Lead Organization (attach additional materials if necessary)

Demonstrate the capacity of the lead and/or partner organizations to successfully complete the proposed project by providing any or all of the following: a) a description of the organization(s) b) resume(s) or summary of qualifications of involved personnel c) evidence of successfully completed habitat restoration or conservation planning projects.

The Rhode Island Natural History Survey is a member-supported, non-profit organization incorporated in 1994 to engage people knowledgeable about Rhode Island's animals, plants, and natural systems with each other and with those who can use that knowledge for research, education, and conservation. The Survey manages data documenting the state's species and natural communities, publishes books and articles about RI biota, facilitates science projects, and hosts events to highlight environmental science, including conferences and the annual Rhode Island BioBlitz.

P.I. David W. Gregg has been director of the Rhode Island Natural History Survey since 2004. An amateur naturalist since childhood, by training David is an archaeologist, holding an M.Phil. from Oxford and a Ph.D. in anthropology from Brown. Prior to the Survey, David directed the Spellman Museum of Stamps and was a curator at Brown's Haffenreffer Museum where his duties included collections management, exhibition development, project management, and teaching. Gregg has considerable experience with managing collections, including archives. Gregg is a Senior Fellow of the Coastal Institute at URI, has hosted documentary videos, published on unconventional curriculum, archaeology, and environmental management, and taught anthropology and museum studies. He is a board member of the Ralph Waldo Emerson Memorial Association and on the Collection Committee of the Rhode Island Historical Society.

Data clerk George Christie has been in his position at the Survey since June 2021. He holds B.S. degrees in Entomology and Landscape Architecture and a M.S. in Entomology from UC Riverside. He has 12 years' experience as a garden designer and in garden centers, where he studied botany and developed databases for inventory and sales. He was school and youth program coordinator for Historic New England for 7 years, assigned primarily to Casey Farm, Saunderstown. For 13 years prior to that, he worked around Rhode Island, especially in coastal wetlands, as a mosquito control contractor.

Database work at the Survey is overseen by the Science and Data Committee of the Survey Board of Directors, chaired by Dennis Skidds, a biologist and data manager for the National Park Service Northeast Coastal and Barrier Network, stationed at URI. As part of the match for this project, the Survey will be organizing a user group of scientists, environmental managers, naturalists, and other stakeholders to steer the database development to maintain alignment with real user needs and prefigure development of a public-facing portal in the future.

The Natural History Survey has been managing large biodiversity datasets since it was founded in 1994. It has published 6 checklists of taxa based on its biodiversity datasets. It currently operates the Rhode Island Natural Heritage Database (as an Excel file) under terms of an agreement among URI, The Nature Conservancy, RIDEM, and the Survey. Approximately four dozen data requests are served annually by the Survey using that database. Until BORIIS2 access procedures and channels are formalized, RINHS will provide data from the Coastal Wetland Plant dataset manually to those who request it.

10. External Factors and Climate Change

Identify existing external (off-site) factors that may be affecting habitat within the study area. How will external factors be considered? What are the likely effects of climate change and sea level rise within the study area and how will these be considered?

The database being developed through this project is absolutely essential for documenting and understanding landscape level change over time, including and especially climate change. It will help take the best advantage of prior monitoring and restoration investments across RI's coastal wetlands. This project will facilitate inclusion of prior data in policy, planning, management, and restoration efforts that will only accelerate and increase in importance as climate change continues to accelerate.

V. EVALUATING PROJECT SUCCESS (one page maximum)

1. Performance Measures and Deliverables

How will the success of the project be measured in relation to the restoration goals set forth in this proposal? List all deliverables (e.g. reports, updates, websites, etc.) associated with the project..

The primary deliverable is a developmental version of the BORIIS2 database following the existing schema. There will be plant inventories from at least 25 coastal wetland sites entered into BORIIS2. There will be a user group to guide database development during this project and going forward from it. It will have met at least 6 times and reviewed the BORIIS2 implementation. There will be a Coastal Wetland Plant Atlas with metrics from this project, description of data gaps or coverage gaps (geographic, taxonomic, or habitat type) discovered during the project, and samples of products created using BORIIS2, including sample maps. The Coastal Wetland Plant Atlas will be available as a PDF on the Survey website and an announcement about it made to a broad range of stakeholders. Full functionality and public access for BORIIS are for future projects, but there will be a written plan for further buildout of BORIIS2 including next steps toward access for user groups including the public.

1. developmental database
2. collated data from 25 sites
3. user group with meetings
4. Coastal Wetland Plant Atlas with metrics, data gaps, and sample output products posted as PDF
5. announcement about availability of Atlas
6. written plan for next steps towards further implementation and access

2. Monitoring Plan

Describe any monitoring activities that are part of the planning project. For each monitoring activity list the frequency and month/year of start and end date and the parameters measured. List the entity or entities responsible for funding and carrying out each monitoring activity, and describe how results will be made available to CRMC and the public. If using an established monitoring protocol, please provide references (see CRMC website for information on established monitoring protocols).

N/A

VI. PROJECT BUDGET TEMPLATE

BUDGET CATEGORY	CRMC REQUEST	MATCH	MATCH PENDING OR SECURED? (select one)	SOURCE OF MATCH	TOTAL
database development	13,000				13,000
user group/steering committee		5,455	secured	RI Cons. Stewardship Collaborative (fund at RIF)	5,455
volunteer user group members		2,400	pending	user group members' time for participating in project	2,400
contract botanist	2,310				2,310
data digitization & formatting; Atlas outputs (PT wage employee)	7,817				7,817
data clerk time on project		1,500	secured	RINHS cash/in-kind	1,500
PT intern summer and fall (hopefully Narr. Tribal member)	$3,600				3,600
Atlas preparation & project management	$2,200				2,200
supplies/mileage/etc.		500	secured	RINHS cash/in-kind	500
indirect (10%)	2,893	985	indirect on secured match is secured	CEHRTF& RINHS	3,878
TOTAL	**31,820**	**10,840**		**TOTAL PROJECT COST**	**42,660**

VII. BUDGET NARRATIVE (one page maximum)

Please provide a description and justification for each line item included in the project budget form (e.g. for personnel costs, provide hourly and fringe rates, for travel specify rate and estimated number of miles). Please specify any match requirements for each source of funding. Please include costs associated with required annual and final reports to CRMC. Be sure to detail how CRMC funds will be used.

Database development—this includes two components 1) an estimate based on a quote from a qualified database developer for building a limited prototype to the BORIIS2 specification with an allowance for expanding to a larger taxon and including several cycles of testing and adjustments; and 2) RINHS executive director's time while working directly with the contractor. The exact split between these two is uncertain, which is why they are lumped together, but is probably around 80/20. Regardless, the budget for the whole development process will be the total $13,000.

User group/steering committee—this is an estimate for the time of the RINHS executive director to invite and convene likely BORIIS2 users and organize their involvement over the course of the project. This includes reviewing the specification, providing feedback to the contract developer, and reviewing the output and the Atlas. The funds are already in hand and come from a grant from the RI Conservation Stewardship Collaborative Fund at the RI Foundation. The executive director salary and fringe is $58.85/hour as of this writing.

User group members' time—this is the time for 8 user representatives to participate in 6 2-hour meetings over the course of the year at $25/hour. This is a conservative estimate of users, time, and hourly value, it's likely to be higher.

Contract botanist—this is the time for a contact botanist with expertise in RI native plants and plant taxonomy and nomenclature to find and review plant inventories from coastal wetland reports. It is estimated at $33/hour for two 35-hour weeks or the equivalent spread out over longer.

Data digitization inputs and outputs—this is a new, part-time wage employee at the Survey to find and digitize sources, keyboard data, conduct QA/QC, and work on elements for the Atlas. It is estimated at $22.5/hour for 6 30-hour weeks or equivalent.

Data clerk—The Survey already employs a part-time wage employee in this position whose main job is managing the heritage database. He will be an important part of the BORIIS2 development as well as the plant data entry. He will help support the user group. The budget is an estimate based on wages of $20/hour and fringe of 10.1%.

Intern—There is a lot of detailed work to do to hunt out old plant inventories, digitize them, correct nomenclature, and create materials such as maps for the Atlas. As part of the Survey's recent initiative to work with the Narragansett Indian Tribe consistently over the long-term, we will as Tribal Natural Resource Director Dinalyn Spears to recruit a student or other candidate for this internship from among tribal members. This budget it figured at $20/hour (wage +fringe) for 8 35-hour weeks over the summer and perhaps into the fall.

Atlas preparation and project management—This represents a budget for the Survey executive director to work on the Atlas, a main deliverable of the project, as well as to carry out required reports.

Supplies/mileage/etc.—This represents the Survey's commitment of out-of-pocket miscellaneous hard costs. The Survey maintains a workstation for the data clerk and this will need upgrading in the process of this, also there will be some limited mileage attributable to this grant. This estimated value is conservative.

Indirect—At the Survey, indirect cost recovery covers bookkeeping, contracting, insurance, phones, general office supplies, and other usual costs.

IX. ADDITIONAL MATERIALS

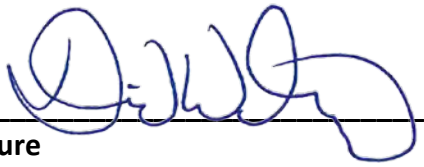
Please include the following with your application:

X map of sites with known plant inventories

X BORIIS2 vision and specification

AUTHORIZED SIGNATURE

AUTHORIZED AGENT OF LEAD ORGANIZATION



Signature **Date** January 27, 2023

Return your completed proposal by 4:00 p.m. on **January 27, 2023** to:

Caitlin Chaffee
NBNERR
RI Dept. of Environmental Management
235 Promenade Street
Providence, RI 02908

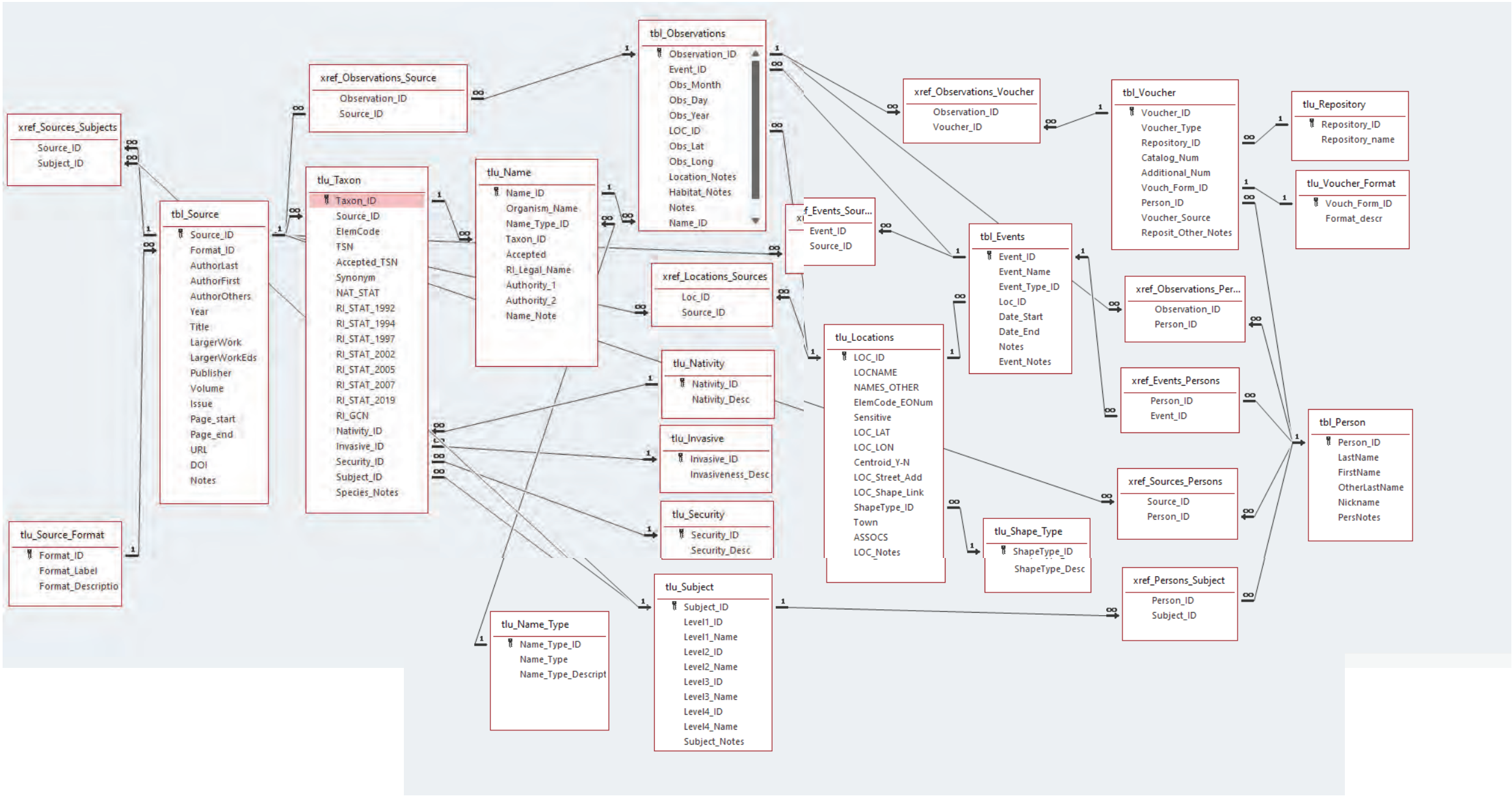
caitlin.chaffee@dem.ri.gov

Applicants are required to submit one (1) signed hard copy of the proposal form and one (1) electronic copy in Adobe PDF format. **Please submit electronic copy as a **SINGLE PDF FILE** containing all application materials.**

Contact Caitlin Chaffee at **401-222-4700 xt. 277-4417** with any questions.

CRMC
COASTAL RESOURCES MANAGEMENT COUNCIL


Examples of coastal sites for which full or partial plant inventories exist (there are others).
N
20 km
RHODE ISLAND
NATURAL HISTORY SURVEY
Providing Ecosystem Science and Information
Google Earth
Image © 2022 TerraMetrics
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus


xref_Sources_Subjects
Source_ID
Subject_ID
tbl_Source
Source_ID
Format_ID
AuthorLast
AuthorFirst
AuthorOthers
Year
Title
LargerWork
LargerWorkEds
Publisher
Volume
Issue
Page_start
Page_end
URL
DOI
Notes
tlu_Source_Format
Format_ID
Format_Label
Format_Descriptio
xref_Observations_Source
Observation_ID
Source_ID
tlu_Taxon
Taxon_ID
Source_ID
ElemCode
TSN
Accepted_TSN
Synonym
NAT_STAT
RI_STAT_1992
RI_STAT_1994
RI_STAT_1997
RI_STAT_2002
RI_STAT_2005
RI_STAT_2007
RI_STAT_2019
RI_GCN
Nativity_ID
Invasive_ID
Security_ID
Subject_ID
Species_Notes
tlu_Name
Name_ID
Organism_Name
Name_Type_ID
Taxon_ID
Accepted
RI_Legal_Name
Authority_1
Authority_2
Name_Note
tbl_Observations
Observation_ID
Event_ID
Obs_Month
Obs_Day
Obs_Year
LOC_ID
Obs_Lat
Obs_Long
Location_Notes
Habitat_Notes
Notes
Name_ID
xref_Locations_Sources
Loc_ID
Source_ID
tlu_Nativity
Nativity_ID
Nativity_Desc
tlu_Invasive
Invasive_ID
Invasiveness_Desc
tlu_Security
Security_ID
Security_Desc
tlu_Name_Type
Name_Type_ID
Name_Type
Name_Type_Descript
tlu_Subject
Subject_ID
Level1_ID
Level1_Name
Level2_ID
Level2_Name
Level3_ID
Level3_Name
Level4_ID
Level4_Name
Subject_Notes
f_Events_Sour...
Event_ID
Source_ID
xref_Observations_Voucher
Observation_ID
Voucher_ID
tbl_Events
Event_ID
Event_Name
Event_Type_ID
Loc_ID
Date_Start
Date_End
Notes
Event_Notes
tlu_Locations
LOC_ID
LOCNAME
NAMES_OTHER
ElemCode_EONum
Sensitive
LOC_LAT
LOC_LON
Centroid_Y-N
LOC_Street_Add
LOC_Shape_Link
ShapeType_ID
Town
ASSOCS
LOC_Notes
tlu_Shape_Type
ShapeType_ID
ShapeType_Desc
tbl_Voucher
Voucher_ID
Voucher_Type
Repository_ID
Catalog_Num
Additional_Num
Vouch_Form_ID
Person_ID
Voucher_Source
Reposit_Other_Notes
tlu_Repository
Repository_ID
Repository_name
tlu_Voucher_Format
Vouch_Form_ID
Format_descr
xref_Observations_Per...
Observation_ID
Person_ID
xref_Events_Persons
Person_ID
Event_ID
xref_Sources_Persons
Source_ID
Person_ID
xref_Persons_Subject
Person_ID
Subject_ID
tbl_Person
Person_ID
LastName
FirstName
OtherLastName
Nickname
PersNotes

BORIIS2 (Biota Of Rhode Island Information System)

What:

- A relational database
- A successor to BORIIS1*

Function:

To index observations of species in Rhode Island from a variety of sources
(think of the question, "If, when, and where did/does such-and-such species live in Rhode Island and how do we know?)

Primary Purpose:

Provide a data facility for management of rare species

Secondary Purposes: Provide a data facility for

- management of invasive species or other categories of species (e.g. species of research interest)
- supporting inventories and surveys esp. distributed, community science type projects
- connecting users with info on RI specimens in far-flung, hard-to-access collections
- compiling biographical information on naturalists who've worked in RI
- compiling bibliography of publications on Rhode Island natural history

Primary Users (initial build-out):

1. Internal use of the Natural History Survey staff (including volunteers) to index species observations that come to our attention through a range of sources
2. Staff in partner organizations to access information on the location and viability of species listed as rare by the state of Rhode Island.

Secondary Users (stage two):

- other government agency and nonprofit personnel needing data for management of rare species or invasive species.
- support an online tool that allows the public to access appropriate data (i.e. to see what species live in their town, whether anyone's ever seen a certain species in RI before, etc.)

Main attributes:

- **Indexical**...data are brought into BORIIS to answer the "who, what, when, where" questions and identify the source(s) of the information; to minimize size and ongoing maintenance, the details of observations or general information about a species, place, etc. are often not added when users can relatively easily follow a citation back to the original source or use an existing data source elsewhere (gobotany, bugguide, books in library, etc).
- Existing data from BORIIS1 used where possible.
- Most operations can be done with minimal special training; requires minimal (or no) ongoing work by specialist database technician.

*BORIIS1 consisted of several Access databases coordinated through a single front end, organized in about 2004. BORIIS1 incorporated some 110,000 lines of data from the Natural History Survey's previous internal database (FileMaker Pro-based), the Odonata Atlas of RI, Beetles of RI, and Mycota of RI projects, the legacy RI Natural Heritage Program database, and substantial data-mining within published and unpublished written sources, photographs, and museum specimens.

- QA/QC built in as much as possible with auto-complete, dynamic searches, drop-down menus, and pre-packaged QA queries, etc.
- Rare species locales, landowner identification, and other sensitive data can be segregated/obscured under certain specified circumstances
- Will support future development of on-line public access for species searches and filtering and data submission/input.

Use scenarios and functionality requirements:

Information we want to input is structured as an OBSERVATION (Observation_ID), which includes the characteristics: a) what species? b) when? c) where? d) who saw it? and e) who says so or how do we know this?

1. "Bob submitted a field form for a puritan tiger beetle he saw at Goosewing Preserve on April 15, 2019."
2. "In NE Naturalist Jane published a list of ants found during a trip to RI in June, with site and date for each." or "The Master's thesis of URI student Harry Potter contains a list of the following species observed at his test plot during the summer of 1979."
3. "At the 2009 BioBlitz on June 10-11, this list of people recorded this list of species at Sprague Farm, Glocester and the list is in the RINHS archive."
4. "Here's a list of the RI plant specimens in the Harvard herbarium, with collector, date, and location of each."

Tables: Core table is tbl_Observations and the Primary Key is Observation_ID

Each OBSERVATION_ID must be accompanied by 1) Name_ID, 2) Date, 3) place (either a LOC_ID or an Obs_Lat and Obs_Long), and 4) either a Source_ID or a Voucher_ID or both.

1. Name (Name_ID) *(mandatory)*:
    a. the name reported by the observer, correlated via tlu_Name to a unique Taxon_ID representing the current, RI-accepted taxonomic name;
    b. common names and synonymy in the Linnaean system are connected to a taxon's RI-recognized entry using tlu_Name and Name_Type_ID
    c. observations can be entered without identification all the way to species level with any higher order Name being identified as to its taxonomic rank using tlu_Name_Type.
    d. for most taxonomic groups, species are assigned static numbers by RINHS for internal use, which can be cross-walked to ITIS or other systems as needed but don't have the maintenance requirements of using those numbering systems as keys in our tables.
    e. observations "roll-up" to higher taxonomic levels using Subject_Code contained in tlu_Subject.
2. Date (ObsDate) *(mandatory)*
3. Place (either Obs_Lat plus Obs_Long or LOC_ID) *(mandatory)*: can be either a point, expressed by Obs_Lat plus Obs_Long, or, via tlu_Locations:
    In addition to Obs_Lat and Obs_Long, by using LOC_ID, locations can expressed as:
    a. a point or centroid using LOC_LAT plus LOC_LONG
    b. a polygon using LOC_Shape_Link to connect to a GIS shape file
    c. street address (based on E911 data)
    d. a named place (either as a centroid or a polygon) based on USGS's GNIS augmented with other sources
    e. one of the list of conservation parcels expressed as polygons from the state's conservation lands GIS data layer)

f. the site of an event that appears in tbl_EVENTS (e.g. RI BioBlitz 2018) and is described by either a centroid or a GIS polygon)

Every heritage EO has a LOC_ID that serves as the main key into data about it

Every Observation_ID has to connect to at least one evidentiary table, either "Source" (aka bibliographic citation) or "Voucher" (a specimen, sample, or photo). Also, every Observation_ID has to connect to a Person_ID via xref_Observations_Persons.

4. bibliography (Source_ID) can include more than traditional books and reports...i.e. it can include field notes and "personal communications":
    a. fields to record enough information to allow someone to find the source if it is
        i. a published book or journal article
        ii. unpublished report
        iii. manuscript field notes or correspondence/email in some particular repository
5. vouchers (Voucher_ID)
    a. these are either a specimen (and those come in different types listed in a tlu) or a photo (which for our purposes count as vouchers)

OTHER TABLES:

6. events (Event_ID) *(not mandatory for* OBSERVATIONS*)*:
    b. date or date range (as in a bioblitz taking 2 days or a trap that's set for a week, etc.)
    c. location in form of LOC_ID (name, parcel, or street address, or a point, line, or polygon)
    d. list of people (Person_IDs) who attended
7. people (Person_ID) *(mandatory)*:
    - one single list of people associated with observations
    - allows areas of expertise to be associated with a person using tlu_Subject
    - accommodates married names
    - allows recording basic info such as degrees, groups associated with, etc.
8. repositories (Repository_ID) (*mandatory for* VOUCHERS)
    e. a list of museums, herbaria, libraries, archives
9. subjects (Subject_ID) (*mandatory for* TAXONS, PERSONS *and* SOURCES)
    a. This is an ordered list of numbers that correspond to taxonomic groups and natural history subjects (think of the Dewey Decimal system only simpler). They are ordered so that, when sorted in ascending order, groups of subjects in lower positions will roll up to the relevant higher position. ("insects" and "crustaceans" both will appear under "arthropods"). See discussion on Subject_ID below.

Queries— input and output:

The outputs are almost always something like the following:

1. Has kudzu ever been seen in Rhode Island? If so when, where, and where can I go to get more information on that?
2. How's small-flowered crowfoot doing in RI? What sites is it known from? Which are recent, which are old? Who reported each sighting...is that person knowledgeable on that?
3. When (year alone or year with date) was the last time a puritan tiger beetle was seen at Goosewing Preserve? Under what circumstances and is there a picture or a specimen I can go see?
4. Give me a list of the ants known from Jamestown?
5. Has anyone ever done a plant list for Bristol? If so, when and what plants did they find?
6. Which bumblebee species were found in Providence County before 1975 that haven't been seen since? What written references or museum vouchers support the sightings?
7. Give me a list of sites where Spiranthes orchids have been seen since 1975. Is that number going up or down compared to some previous period?
8. Bonnie says she saw a quillwort at Limerock Preserve. Did anyone else see one there before? How long ago? Were the circumstances (date, weather, etc.) similar?

These questions can be answered via

1. a control panel that is centered around a taxon of interest...usu. species but could also be genus, family, or one of the Subject_IDs (see discussion of Subject_IDs below), for example "Orchidaceae".
2. a way to filter by some combination of species, place, date, and person, including a range of dates, species by a higher taxonomic level (e.g. Orchidaceae), nested named places, and wildcards (i.e. value= "any")
3. a control panel focused around a person showing their expertise, publications, specimens, and manuscripts, and the earliest and latest dates of their observations
4. a way to filter sources (biblio, manuscripts, or vouchers) by species (or higher taxon) or by the places they report species from.

Data entry scenarios and problems:

1. Excel sheets with each line being an OBSERVATION containing a combination of species, sites, dates, and observers and attributable to one source. The whole table may represent observations of one observer, one date, one site, one species, or one source with the other four variables varying from line to line. Example: 1,072 species found at event "bioblitz 2014" held at Rocky Point Park on June 13-14 by 158 people collectively.
2. Has to allow for observation(s) where one of the characters isn't known precisely...e.g. "Callophrys sp." for species or "Washington Co." for location, or "1921" for date w/o month/day.
3. Has to allow addition of new values in any field easily. Entering new instances of species, sites, and sources that are already in the database is easy but when a list contains a place (for example) that's not already in the database it has to open a window or somehow make it easy to add the new one
4. Careful not to duplicate species that have synonyms...e.g. an observation reported using a synonym, either not the binomial of record or not the generally accepted common name.
5. Named sites that are parts of larger already named sites or use an umbrella name because the narrower one isn't known for that particular observation e.g. Long Point/Goddard Park/Potowomut Neck/Warwick.

Narragansett Indian Tribe
1-401-364-1100 1-800-287-4225
Fax (401) 364-1104
TDD - 711

February 9, 2023

Caitlin Chaffee
Narragansett Bay National Estuarine Research Reserve

Dear Ms. Chaffee:

This is a letter in support of the Rhode Island Natural History Survey's proposal, "Plant species diversity in coastal wetlands: capacity-building for landscape-level planning, assessment, monitoring, and management." I hope you will fund the proposal through the Rhode Island Coastal and Estuary Habitat Restoration Fund. I have discussed the Survey's proposed project with Survey Director, David Gregg, and we discussed the possibility that Tribal member interested in plants could be found to participate in the project during the summer and into the fall of 2023. If the project is funded, I will work with the Survey to identify a suitable Tribal member for the part-time intern position described in the grant proposal.

Narragansett people have significant knowledge of the natural resources of Rhode Island's coastal environment that could contribute to a collective effort to maintain and restore ecological functions and values of coastal wetlands. Tribal members benefit directly from a healthy, restored environment in coastal habitats, which were extremely important for Narragansett people traditionally, and remain so today. Similarly, the Survey has knowledge and connections related to coastal wetland plants that would further the conservation and management mission of the Tribe's Community Planning and Natural Resources Department. Finally, for a young Tribal person interested in plants, whether through traditional ecological knowledge, academic botany, or both; a summer job working with scientists and volunteer botanists and developing computer databases will provide environmental engagement, income, and a potentially life-changing educational opportunity.

Thank you for considering the Survey's application carefully, and I hope you will support it.

Sincerely,

Director of Community Planning/Natural Resources
Vice-Chair NIT Land & Water Resources Commission

P.O. Box 1354 • 4533 South County Trail • Charlestown • Rhode Island 02813