

DATE: March 10, 2020  
TO: Council Chair Jennifer R. Cervenka and members of the Council  
Cc: Grover Fugate, Executive Director  
FROM: Caitlin Chaffee, Coastal Policy Analyst, TAC Coordinator  
Re: Projects Recommended for Funding Under the RI Coastal Habitat Restoration Trust Fund

The RI Coastal and Estuarine Habitat Restoration Team's Technical Advisory Committee (TAC) convened on Tuesday, February 11, 2020 to rank the 7 final 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 2019-2020 funding cycle, seven are recommended for funding.

The projects recommended for full funding are:

1. Walker Farm Shoreline Restoration, Barrington (\$27,450)
2. Goosewing Salt Marsh Restoration, Little Compton (\$6,000)
3. Lower Kickemuit Dam Removal Assessment and Engineering, Warren (\$75,000)
4. Third Beach Dune Habitat Restoration, Middletown (\$4,900)
5. Improving Fish Passage at Belville Fish Ladder, North Kingstown (\$66,000)
6. Reducing Coastal Erosion at Rose Larissa Park, East Providence (\$40,000)

The projects recommended for partial funding are:

1. Edge Restoration in Blackstone Park Conservation District (\$5,650)

In addition, the committee has created a contingency list of projects to be funded in the event that a project recommended for funding is unable to go forward or the requested funds are not needed due to unforeseen circumstances.

2019-2020 Contingency List:

1. Remainder of requested funds for Edge Restoration in Blackstone Park Conservation District (\$52,325)

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  
Gary Casabona, USDA-Natural Resources Conservation Service  
Caitlin Chaffee, RI CRMC  
Philip Edwards, RI DEM Division of Fish and Wildlife  
Wenley Ferguson, Save The Bay  
Mike Gerel, Narragansett Bay Estuary Program  
Alan Gettman, RI DEM Mosquito Abatement Coordination Program  
Suzanne Paton, US Fish and Wildlife Service  
Margherita Pryor, US Environmental Protection Agency  
Jim Turek, NOAA Fisheries 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 2020.\*

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

## Funding Recommendations for 2019-20 Trust Fund Monies

### Projects recommended for funding

Project Name	City/Town	Award Amount	Match
<i>Walker Farm Shoreline Restoration Project</i>	Barrington	\$27,450	\$22,350
<i>Edge Restoration in Blackstone Park Conservation District</i>	Providence	\$5,650	\$10,250
<i>Goosewing Salt Marsh Restoration</i>	Little Compton	\$6,000	\$3,500
<i>Lower Kickemuit Dam Removal Assessment and Engineering</i>	Warren	\$75,000	\$84,150
<i>Third Beach Dune Habitat Restoration</i>	Middletown	\$4,900	\$4,900
<i>Improving Fish Passage at the Belville Fish Ladder</i>	North Kingstown	\$66,000	\$70,000
<i>Reducing Coastal Erosion Using Nature-Based Infrastructure at Rose Larissa Park</i>	East Providence	\$40,000	\$55,000
<b>TOTAL</b>		<b>\$225,000</b>	<b>\$250,150</b>

### Habitat Restoration Team Technical Advisory Committee Members:

<u>Member</u>	<u>Affiliation</u>
Tom Ardito	Restore America's Estuaries
Gary Casabona	USDA-Natural Resources Conservation Service
Caitlin Chaffee	CRMC
Phil Edwards	DEM Division of Fish and Wildlife
Wenley Ferguson	Save The Bay
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



# Habitat Fund FY20

Locations of Recommended Projects

Blackstone Park

Rose Larissa Park

Walker Farm

Lower Kickemuit Dam

Belville Fish Ladder

Third Beach

Goosewing Beach

Google Earth

© 2020 Google

Image Landsat / Copernicus

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

20 mi





# Rhode Island Coastal and Estuary Habitat Restoration Fund

## Full Proposal Form 2019/2020

### I. PROJECT SUMMARY

1. **Project Title:** Walker Farm Salt Marsh Migration and Buffer Restoration and Resilience Project
2. **Project Location (include map):**  
Walker Farm is a 48.5-acre Town owned property located at the southern end of Hundred Acre Cove to the east of County Road/Wampanoag Trail (RI Route 114). The majority of the site is zoned "Conservation" and the area between the north-south road and Hundred Acre Cove is zoned "Open Space-Passive Recreation." A location map has been included in Appendix A.
3. **Project type (Planning, Design, Construction, Monitoring and Assessment or Other):**  
Construction
4. **If other, please specify:** N/A
5. **Habitat type (River System, Salt Marsh, Seagrass Bed, Shellfish Bed, Coastal Upland or Other):**  
Salt Marsh and Coastal Buffer
6. **If other, please specify:** N/A
7. **Restoration technique (e.g. re-vegetation, tidal restoration, etc.):**  
Removal of fill, bank regrading, and planting of coastal buffer and salt marsh species.
8. **Total acreage or miles (river systems) of habitat to be restored, or project area planning unit size:**  
The Project will restore approximately one-third of an acre of shoreline habitat (along roughly 300 feet of shoreline at edge with Hundred Acre Cove) - the CEHRTF Project is part of a larger project which includes restoring an additional two-thirds of an acre of salt marsh and coastal buffer habitat.
9. **Project benefits:**  
The work associated with this Project will restore an upper marsh and coastal buffer habitat, create a salt marsh migration corridor, and improve water quality while increasing site resilience to natural hazards including flooding, storm surge, and sea level rise.
10. **Project partners (organizations providing financial or other support to the project):** Town of Barrington, Save The Bay, RI Infrastructure Bank, CRMC, Town of Barrington's Nockum Hill Management Committee, DEM's Division of Fish and Wildlife
11. **Is this 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:** FY2004 (\$30,000)

## II. PROJECT MANAGER CONTACT INFORMATION

1. **Name:** Kim Jacobs, Resiliency Planning Consultant
2. **Organization:** Town of Barrington, Rhode Island
3. **Address:** Barrington Town Hall, 283 County Road, Barrington RI 02806
4. **City:** Barrington      5. **State:** Rhode Island      6. **Zip:** 02806
7. **Phone:** 247-1900, extension 283
8. **Email:** kjacobs@barrington.ri.gov
9. **Property Owner(s):** Town of Barrington, Rhode Island

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

The Property Record Card establishing the Town of Barrington as the owner of the property has been included in Appendix A.

## III. BUDGET SUMMARY

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

### BUDGET SUMMARY

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

<b>Amount Requested from Trust Fund</b>		<b>\$27,450</b>
<b>Matching Funds</b>	<b>Project Partner(s)</b>	<b>Amount of Match</b>
Municipal Resilience Program Action Grant (Approved)	RI Infrastructure Bank	\$15,800
Volunteers	Save The Bay	\$3,050
Town funds, staff time	Town of Barrington	\$3,500
	<b>TOTAL PROJECT COST</b>	<b>\$49,800</b>



#### 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.*

Walker Farm encompasses 48.5-acres of upland, coastal buffer, and salt marsh at the southern end of Hundred Acre Cove to the east of Wampanoag Trail. Historically the farm was used for grazing livestock and the shoreline was filled with concrete rubble during the period of agricultural use. After purchasing the Walker Farm property in 1966 the Town removed the buildings on the site and made improvements over time to accommodate public recreation, access to the water, community gardens, and a Town-managed leaf and compost facility. In 1996 Save The Bay identified the Walker Farm salt marsh between Wampanoag Trail and the municipal and recreational uses areas as a potential salt marsh restoration site. The project, which involved multiple stakeholders including NOAA, NRCS, Save The Bay, RIDEM, CRMC and the Town of Barrington, restored tidal flow to the salt marsh through the installation of new culverts at three locations in the marsh in 2005. During the post-construction restoration monitoring period, Save The Bay identified the project area proposed in this Application as a potential site for a marsh migration and coastal buffer restoration project.

With improvements to Walker Farm identified as a priority in multiple Town planning documents, the Town has engaged a consultant to work with stakeholders - including Save The Bay, local boards and commissions – to create a vision for the property. The resulting plan for Walker Farm includes facilitating coastal adaptation and restoring coastal habitats, including the salt marsh and coastal buffer, while enhancing public access to Hundred Acre Cove.

The *Location Map*, *Existing Conditions*, and *Concept Plan* for the entire Walker Farm site have been included as Appendix A. As shown on the *Concept Plan* the proposed improvements to the site have been separated into three grant projects: Coastal and Estuary Habitat Restoration Trust Fund (CEHRTF) Grant, Municipal Resiliency Program (MRP) Action Grant, and DEM Outdoor Recreation Grant. The scope of work for this Project is separate from the activities in the Town's MRP Action Grant - which the Town has been awarded (announcement expected in late January/early February 2020) – and the DEM grant proposal (under review). CEHRTF funding will be used for restoring the northern marsh migration corridor and coastal buffer; the MRP funding will restore the southern shoreline, foster a southern marsh migration corridor, and create buffer zones; and the DEM Outdoor Recreation Grant will fund a boat launch for human-powered craft.

The restoration area associated with the CEHRTF Grant encompasses the northern shoreline of the open field at Walker Farm, and extends north to include a section of wooded shoreline that has fill material and invasive plant species. This project proposes to address environmental impacts to the site that occurred decades ago when the property was the site of agricultural activities. During that timeframe the private property owner disposed of large concrete block materials (rubble) along the edge of the salt marsh and cove. The rubble filled some of the marsh and created an abrupt berm along the edge of the shoreline. The berm prevents the salt marsh from being able to migrate inland. Many invasive shrubs, trees and vines grow on the rubble berm. Some of the lawn area inland of the berm is low in elevation and could support upper marsh vegetation such as *Iva frutescens* and *Baccharis halmifolia* as well as other upper marsh species if the berm was removed. The CEHRTF proposal includes the removal of the rubble and regrading and restoring approximately 300 feet of shoreline at edge with Hundred Acre Cove. After regrading, planting a combination of salt marsh plants and native shrubs and grasses in the regraded bank area and lawn will be conducted using funds from the MRP grant and volunteers under the supervision of Save The Bay.

The short-term outcomes associated with the improvements for this Project will restore salt marsh and coastal buffer habitat, improve water quality of the Barrington River, improve shoreline access for citizens to appreciate the area's natural resources and beauty, provide educational outreach on climate adaptation and restoration, and increase the site's resilience to ongoing climate change impacts by serving as an adaptation zone for increases in flooding and accelerated sea level rise. The long-term outcomes of the salt marsh and coastal buffer restoration project include creating an area for the marsh to migrate as sea level rises. This marsh migration corridor could provide foraging habitat for the state endangered diamond-back terrapin in the future (Schwartz, 2013) as existing marsh either erodes or drowns in place.



## 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 at Walker Farm associated with the CEHRTF Grant have been outlined on the Preliminary Site Plan (included as Appendix B) and will effectively restore an upper marsh and coastal buffer habitat, create a salt marsh migration corridor, and increase site resilience to tide/storm events along a 300-foot corridor at edge with Hundred Acre Cove. Photos of the existing conditions have been included in Appendix C.

The Town of Barrington will finalize the site plan and plantings with input from project partners including Save The Bay, DEM Division of Fish and Wildlife's herpetologist, Scott Buchanan, and the Town of Barrington's Nockum Hill Management Committee. The core team for the Project, will continue to work collaboratively on the final design with the expectation that all work be guided by ecological restoration and ecosystem-based adaptation strategies. Sea level rise projections will be incorporated into the design strategy to ensure the design is sustainable and resilient.

### **Project Activities include:**

- Remove and dispose of large concrete block materials that had been dumped along the shoreline and created impaired ecological conditions
- Remove existing invasive trees, shrubs and vines growing in the rubble and along the bank
- Remove the section of berm in the cobble stone area with the lowest elevation to create a marsh migration corridor
- Regrade existing banks along shoreline to natural gradual sloped profiles to foster salt marsh migration
- Plant native species of shrubs and grasses to restore upper marsh area and coastal buffer. Examples of species being considered include: *Distichlis spicata*, *Iva frutescens*, *Baccharis halimifolia*, *Spartina pectinata*, *Morella pensylvanica*, *Juniperus virginiana*, *Virburnum dentatum*, *Rosa virginiana*, *Prunus maritima*, and a combination of warm season grasses to create suitable area for terrapin nesting habitat including *Panicum virgatum*, *Solidago sempervirens* and *Schizachyrium scoparium*.

### **Project Timeline:**

April 2020: Finalize design and engineering for the marsh migration and bank regrading

May 2020: Submit permit application to CRMC

August 2020: Develop bid documents and put project out to bid

September 2020: Award bid

October/November 2020: Remove/dispose of dumped fill material, remove invasive plants, and regrade bank

October/November 2020 and April 2021: Plant regraded bank and buffer area

April 2021: Submit final report to CRMC

## 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).*

The potential impacts resulting from project activities are few and easily mitigated through the installation of required soil erosion controls. The majority of the work to be conducted is above the high tide line. All concrete will be disposed at an off-site location. Contaminant testing will be done on the concrete material and based on the findings the Town will remediate accordingly. Any native shrubs at the base of the bank will be flagged in an effort to avoid disturbance while removing the rubble material and regrading the shoreline to its natural sloped profile.

While not directly related to the improvements associated with this Project, the Town is considering installing a wash station for aquatic invasive species near the boat launch areas. As the cost for this improvement is fairly substantial because a water supply source is not currently available on site, the Town is pursuing this opportunity through additional grant sources.



#### **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 Town of Barrington values community and stakeholder input. The goals of the overall Walker Farm Recreation and Resilience Improvement Project are consistent with the goals, policies and actions of the Comprehensive Community Plan and the Hazard Mitigation Plan – both written with extensive community input. Building off these initiatives, the Town over the past 18 months has engaged in a community-driven process with key stakeholder groups, including Save The Bay, to create a vision for Walker Farm that incorporates priority adaptation actions while also relocating and improving recreational facilities. The conceptual plan was presented to and endorsed by several Town boards including the Resiliency and Energy Committee, Conservation Commission, Parks and Recreation Commission, and Harbor Commission. All boards unanimously supported the project and input from the boards has been incorporated into the design.

The Town is committed to continuing community and stakeholder engagement as the design process moves forward. It is with pleasure that the Town provide, as Appendix D, letters from the following stakeholders indicating their support for the Walker Farm Project.

- Shaun O'Rourke, Director of Stormwater and Resiliency, RI Infrastructure Bank; RI-Chief Resilience Officer
- Cynthia Coyne, Rhode Island State Senator
- Liana Cassar, Rhode Island State Representative
- Jason Knight, Rhode Island State Representative
- Wenley Ferguson, Save The Bay
- Teresa Crean, Coastal Resources Center/RI Sea Grant
- Town of Barrington Resiliency and Energy Committee
- Town of Barrington Conservation Commission
- Town of Barrington Harbor Commission

#### **5. Economic and Educational Benefits**

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

The Town is committed to engaging in creative community outreach and education to highlight this important environmental and climate adaptation work.

The Town in collaboration with Save The Bay will recruit community and student volunteers from area schools to participate in implementing certain design components such as planting the buffer of native plants to foster habitat restoration. Other approaches include public workshops and panel discussions, and inclusion of students through a climate adaptation segment (using Walker Farm as a demonstration site) on Barrington High School's morning Sunrise Show.

Other creative approaches include promoting community members to post on the Town's Flood Protection website photos of the habitat restoration and adaption project as it evolves over time; coordinating with the Barrington Learning School on-site art workshops for artists of all kinds to experience and appreciate the coastal beauty and adaptation efforts; and coordinating with the Barrington Public Library a workshop for younger students to create artwork focused on shoreline habitats.

A long-term outreach strategy and on-going educational benefit will be afforded by the installation of several permanent educational panels focusing on site history and site restoration, adaptation, and resiliency to educate the community on the purpose and value of coastal green infrastructure. The cost of creating and installing these panels at Walker Farm has been included in the MRP and DEM grants.

## 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?*

Walker Farm is an environmentally sensitive site and important to the ecological health of Hundred Acre Cove, the Barrington River, and Narragansett Bay. The Town of Barrington and the State of Rhode Island recognize that coastal communities are highly vulnerable to climate change, particularly sea level rise and more intense storm events. These impacts are expected to increase in frequency and intensity in the coming decades, underscoring the need to continue protection of open space parcels within low-lying and critical habitat areas, such as Walker Farm.

Understanding how changing climate conditions will impact the site is critical in designing appropriate adaptation improvements. As depicted in Appendix E, CRMC's STORMTOOLS has been used to illustrate the impact of future sea level rise at the site. Additionally, CRMC's Sea Level Rise Affecting Marshes Model (SLAMM) has been employed to determine the marsh migration corridor at Walker Farm under 1-, 3- and 5-foot sea level rise scenarios. Under current conditions, salt marsh vegetation has already begun to colonize low lying sections of the former lawn as predicted in the 1-foot sea level rise scenario.

The proposed resilient site and landscape design will allow the shoreline to adapt to periodic flooding and sea level rise. The designs' natural systems-based approach goes beyond a single project element, resulting in the preservation of ecosystem biodiversity and all of the ecosystem services they provide – wildlife habitat, pollution filtration, flood storage, coastal and buffer habitat among others.

Climate change related design elements for this Project include:

- Reconfigure the shoreline to restore native buffers and salt marsh and to enhance ecosystem services such as stormwater filtration, wave buffering, and flood storage. Existing banks will be regraded to a more dissipative slope and planted with native salt tolerant grasses. In reestablished buffer zones at the edge of the tidal zone, plantings will be composed of hardy native species, including grasses that are salt tolerant and shrubs and trees that can tolerate both periodic flooding and drought. The restored buffer and salt marsh root structures will help to stabilize the shoreline.
- Rather than attempt to prevent against coastal flooding, overall site design will integrate the periodic flooding into the use and experience of the site. The team has integrated restoring tidal hydrology into the site design so that the salt marsh migration corridors subject to coastal flooding can drain preventing impounded water, substrate subsidence, and stagnant water that creates mosquito breeding habitat.

## 7. 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 goals of the Walker Farm Project are consistent with the Town's long-recognized need to improve the site as documented in the Town's Comprehensive Plan, Hazard Mitigation Plan, Harbor Management Plan, and Open Space Plan – all of which engaged public input. Additionally, Walker Farm was identified as a high priority climate adaptation project by participants of the Town's August 2018 *Building a Resilient Community* Workshop and the September 2019 State of Rhode Island Municipal Resilience Program CRB Workshop.



## 8. 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 proposed Project will result in benefits to a number of species. Through the restoration of the salt marsh migration corridor, a future habitat for the salt marsh sparrow, ranked by the US Fish and Wildlife Service as a bird of conservation concern. Saltmarsh sparrows are threatened by accelerated sea level rise and habitat degradation. Creating areas for the salt marsh to migrate inland will preserve future nesting habitat for the salt marsh sparrow and other species that nest in salt marshes including seaside sparrows and willets. Native shrubs, including bayberry, *Morella pensylvanica* and Arrowwod, *Virburnum dentatum*, proposed to be planted in the Project area, will provide food for migratory bird species. Seaside goldenrod, *Solidago sempervirens* will be planted at the upper edge of the marsh and provides habitat for migrating monarch butterflies in the fall.

Removing the rubble along the shoreline to enhance the existing marsh and create a future marsh migration corridor could create a future foraging habitat for diamond back terrapins and depending on soils and elevation could also provide a favorable nesting site. Project partners have been in contact with Pete McCalmont from the Town of Barrington's Nockum Hill Management Committee who is a local diamond back terrapin expert and Scott Buchanan the herpetologist for DEM's Division of Fish and Wildlife to review the restoration and planting plans. Mr. Buchanan visited the project site and stated in an email, "Marsh migration is definitely a positive for terrapins in light of sea-level rise and I would encourage any efforts to do it at this site, especially as 100 Acre Cove is such an important terrapin site." Both Mr. Buchanan and Mr. McCalmont will be included in the final design process. The planting plan will be reviewed by Mr. Buchanan and incorporate areas of warm season grasses more suitable for nesting terrapin.

## 9. Permitting

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

The Town of Barrington owns all of the property on which the work is being conducted. As the project site is located within the Rhode Island Coastal Resources Management Council's (CRMC's) jurisdiction along the Hundred Acre Cove/Barrington River, the Town has been in contact with CRMC and is prepared to submit the necessary CRMC permit application.

## 10. 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 Town of Barrington has a responsive and committed leadership with highly experienced and dedicated staff who are motivated to engage stakeholders in a cooperative process that has led to the successful implementation of numerous habitat restoration and conservation projects including:

- 1996 -2005: Walker Farm Salt Marsh Restoration Project
- 2008-2011: Allin's Cove Salt Marsh Restoration Project
- 2011: Byway Road Bank Stabilization Project
- 2014: Barrington Beach Stormwater Infiltration and Coastal Adaptation Project
- 2015: Latham Park Stormwater Management Project

The core project team for the Walker Farm Project includes Philip Hervey, Barrington Director of Planning, Building and Resiliency; Kim Jacobs, Barrington Resiliency Planning Consultant; Alan Corvi, Barrington DPW Director; Colin O'Hara, Barrington DPW Civil Engineer, Wenley Ferguson, Director of Habitat Restoration at Save The Bay, and; Arnold Robinson, Regional Director of Planning at Fuss and O'Neill.

Kim Jacobs, Barrington Resiliency Planning Consultant, will serve as the local project manager and point of contact for the grant. Her resume has been included as Appendix F. Kim looks forward to a positive and productive partnership with CRMC and will maintain open communication with their point of contact. She will ensure that all deliverables are submitted, including a Final Project Report which will contain a brief project summary communicating lessons learned.

Reference (Section IV):

Schwartz, M.L. 2013. Rhode Island South Shore Diamondback Terrapin Project Final Report 2013. Submitted to the U.S. Fish & Wildlife Service-Coastal Program, December 2013. Rhode Island Natural History Survey, Kingston, R.I.

## **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 Town of Barrington recognizes the need for innovative approaches to ecological restoration and habitat protection while addressing the global challenges associated with climate change. To the extent possible, it is the intent of the Town to incorporate nature-based solutions and strategies into projects throughout the Town, including those at Walker Farm.

Because the site improvements have been designed to be simple, nature-based, low-impact, sustainable, and resilient, the operation and maintenance requirements will be minimal. The proposed buffer area will not be mowed and to ensure viability, the Town and Save The Bay will assess the plantings after the first growing season to determine if additional plants are needed. Additionally, The Town and Save The Bay will collaborate on the creation of a buffer zone management plan and include invasive species management for the restored buffer.

### **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?*

There are no identified off-site factors anticipated to negatively impact this project. Rather than attempt to prevent or block the regular flood or storm tides, site design accommodates flooding by planting salt-tolerant species.

The overall resilient site and landscape planning designs will help the Walker Farm site become a healthy coastal ecosystem and public facility amongst periodic flooding and sea level rise. After a storm or seasonal high tide event, portions of the site will be flooded. However, after the water subsides areas designated for public use will again be accessible, while restored shoreline buffers and wetland areas will remain off-limits to the public to avoid human impact in these areas. As the sea level gradually rises, the ecosystem will be allowed to adapt accordingly.

The roadway improvements associated with the MRP and DEM grants will use permeable, gravel and ground stone surfaces instead of asphalt which can be peeled up by floods. The existing road in its current configuration does not allow westward marsh migration and the raised roadway area associated with the MRP Action Grant will not alter this condition.



## 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 shoreline, salt marsh and coastal buffer at Walker Farm have been degraded through human activity (including dumping concrete rubble at water's edge) and stormwater runoff. Such degradation negatively impacts biodiversity and ecosystem services.

The work associated with this Project will improve habitat restoration and water quality while increasing site resilience to natural hazards including flooding, storm surge, and sea level rise. The habitat restoration efforts will be measured in terms of the growth of the native coastal shrubs and grasses and the inland extent of salt marsh vegetation.

### 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).*

Photo stations will be established at the site to document pre- and post-restoration conditions. Save The Bay will work with the Town of Barrington to determine the location of the photo stations. Photo documentation of the site will occur once a year at the height of the growing season in late August/September. Save The Bay will establish vegetation transects from the inland edge of the coastal buffer to the edge of the marsh in order to monitor the change in vegetation pre and two years post the regrading and planting activities. The Town of Barrington is in the process of preparing a living document for resilience projects which will be posted on the Town's website. It is anticipated that the photos and monitoring documentation will be added to the project page in this document and available to CRMC and the public.

## VII. PROJECT BUDGET TEMPLATE

BUDGET ITEM	CRMC REQUEST	MATCH	MATCH PENDING OR SECURED?	SOURCE OF MATCH	TOTAL
Remove existing invasive trees, shrubs, and vines growing in the rubble and along the bank; remove and dispose of large concrete block materials; and regrade shoreline	\$27,450	0	N/A	N/A	\$27,450
Local volunteers to plant native species of shrubs and grasses	0	\$7,600	Secured	Save The Bay	\$3,050
Purchase of plant materials (native species of shrubs and grasses); on-site supervision for volunteers (by Save The Bay); and contaminant testing on concrete materials	0	\$19,500	Secured	MRP Action Grant	\$15,800
Design, permitting, grant administration, and project management	0	\$3,500	Secured	Town of Barrington	\$3,500
<b>TOTAL</b>				<b>TOTAL PROJECT COST</b>	<b>\$49,800</b>



### 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.*

#### **Development of Final Scope of Work and Budget**

During the time between the pre-proposal submittal and now, the Town of Barrington and its partners have worked diligently to further develop the coastal habitat restoration and resilience project along the northern section of shoreline at Walker Farm.

On January 8, 2020, Wenley Ferguson (Save The Bay), Kim Jacobs (Barrington Resiliency Planning Consultant), Colin O'Hara (DPW Civil Engineer), and Cam Evans (DPW GIS Consultant) walked the shoreline with the Town's GPS unit to verify conditions and refine quantities. After determining the actual extent of the concrete rubble/invasive species north of the original project boundary (north into the wooded area) the Town has identified removal of this debris as an important priority for this project. Not only should there be cost savings by removing the concrete rubble as part of this project (coupled with debris removal along the southern section of shoreline under the MRP Action Grant), logistically it will be more difficult to remove at a later date once the adjacent shoreline and buffer areas have been planted.

#### **Line Item 1:**

*Remove existing invasive trees, shrubs, and vines growing in the rubble and along the bank; remove and dispose of large concrete block materials; and regrade shoreline*

In an effort to establish a refined preliminary project estimate, the Town accompanied a local contractor on site and discussed proposed project activities. Based on field inspection and the refined quantities (shown on the Preliminary Site Plan), the contractor provided the Town with a quote for the work associated with this line item. The quote provided (\$27,450) has been used without modification.

#### **Line Item 2:**

*Local volunteers to plant native species of shrubs and grasses*

In an effort to respect the financial limitations of the Trust Fund, while accommodating the cost for removal of the substantial concrete rubble/invasive species beyond the tree line, Save The Bay suggested a concerted effort to engage volunteers in the planting process.

#### **Line Item 3:**

*Purchase of plant materials (native species of shrubs and grasses); on-site supervision for volunteers (by Save The Bay); and contaminant testing on concrete materials*

By having volunteers also do the planting in the southern section as well, a cost savings to the MRP funding can be realized. Coupled with other design refinements, the projected savings will effectively allow the cost for the CEHRTF Project's plant materials, planting supervision, and concrete testing to be purchased through the MRP Action Grant.

#### **Line Item 4:**

*Design, permitting, grant administration, and project management*

The Town will incur all costs associated with this line item, including preparing the required annual and final reports for CRMC.

#### **Concluding Statement**

The Town is passionate about the Walker Farm project and will work ardently to ensure the project is a success. The best opportunity to advance this critically important work along the property's entire shoreline is now - through the leveraging of multiple funding sources. Without the financial assistance from the Coastal Estuary Habitat Restoration Trust Fund, the Town will not be able to implement the northern salt marsh migration and habitat buffer restoration areas.

**Rhode Island Coastal and Estuary Habitat Restoration Fund  
Full Proposal Form 2019/2020**

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

**I. PROJECT SUMMARY**

1. **Project Title:** Goosewing Beach Salt Marsh Restoration
2. **Project Location and coordinates (include map):** Goosewing Beach, Little Compton, RI  
41°29'47.45"N, 71° 7'55.40"W
3. **Project type (Design, Construction or Other):** Other
4. **If other, please specify:** Habitat Restoration
5. **Habitat type (River System, Salt Marsh, Seagrass, Shellfish Bed, other):** Brackish Marsh within Coastal Lagoon. The project area includes the entire shoreline of Quicksand Pond, Little Compton, where it joins with the barrier beach and dune community known as Goosewing Beach Preserve.
6. **If other, please specify:**
7. **Restoration technique (e.g. re-vegetation, tidal restoration, etc.):** herbicide application to control *Phragmites* to promote restoration of native vegetation.
8. **Total acreage or miles(river systems) of habitat to be restored, or project area planning unit size:**  
16 acres extending over 4,000' of shoreline at Quicksand Pond.
9. **Project benefits:** Sustained increase in native plant diversity and perpetuation of rare plant species, improved habitat conditions and forage quality of mudflats and native shoreline plant communities for migratory and breeding shorebirds including Piping Plover and Least Tern, aquatic invertebrates and fishes, and other wildlife.
10. **Project partners (organizations providing financial or other support to the project):** none that are specific to this restoration effort.
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:**  
2011, 2015, 2018

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**II. PROJECT MANAGER CONTACT INFORMATION**

**III.**

1. **Name:** : Cheryl Wiitala, Preserves Manager
2. **Organization:** The Nature Conservancy



3. Address: 159 Waterman St.

4. City: Providence

5. State: RI

6. Zip: 02906

7. Phone: 401-214-4525

8. Email: cwiitala@tnc.org

9. Property Owner(s): The Nature Conservancy

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

#### IV. BUDGET SUMMARY

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

Amount Requested from Trust Fund		\$6,000
Matching Funds	Project Partner(s)	Amount of Match
Project Coordination	The Nature Conservancy (in kind)	\$3,500
	TOTAL PROJECT COST	\$9,500

#### 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.*

Located on the barrier at Quicksand Pond, the marsh at Goosewing is among the largest in the series of coastal lagoons which extends along the Atlantic from Sakonnet Point to the Westport river estuary. The coastal pond and barrier system here is the most pristine of its type in Rhode Island, supporting a complex assemblage of migratory birds, fishes, shellfish and invertebrates. Formerly invaded with a monolithic stand of the common reed, *Phragmites australis*, the brackish marsh at Goosewing now exhibits a robust diversity of emergent and shoreline plants, some of which are rare. Equally important, formerly-invaded mudflats have re-emerged and can once again support feeding shorebirds, including Piping Plover and Least Tern.

The life forms which were to be found at Goosewing in June 2015 have been reported by Rhode Island Natural History Survey in its Bioblitz findings of that year. See <http://rinhs.org/bioblitz-2015-little-compton/>

The Nature Conservancy is committed to maintaining these endemic plant communities which were won at considerable expense and are now a feature of the coastal ecosystem at Goosewing. Given it is now feasible to prevent the re-infestation of *Phragmites* with a targeted approach using a minor amount of herbicide

to manage the aggressive growth of this invasive plant, the Conservancy wishes to employ this option in the coming seasons.

The Conservancy began restoring the Goosewing salt marsh as a pilot project in 2009. Three acres of salt marsh infested with *Phragmites* was treated with herbicide applied with low volume backpack sprayers and hand wicking techniques. Due to the success of native plants emerging in these tested areas, the Conservancy moved to a broad scale approach of restoring the entire 16-acre salt marsh. During 2011-2014 with funding from CRMC's CEHRTF program, control efforts were accomplished by herbicide applications that included low volume spraying via Argo Track Vehicle and backpack sprayers. The work during the pilot and broad scale phases were performed by Aquatic Control Technology (now Solitude Lake Management). Results have shown that *Phragmites* coverage and height had significantly decreased due to the cumulative herbicide treatment and that *Phragmites* was being effectively replaced by a diversity of other native plant species which had remained in this system, either as seeds or in a suppressed state.

From 2015-2019, the Conservancy continued its *Phragmites* control efforts with support of CRMC's CEHRTF. The broad scale approach was completed and the movement toward a maintenance effort approach to controlling the re-establishment of *Phragmites* began. Follow up treatments were performed on re-sprouting *Phragmites* or missed stands. These treatment methods involved only low volume backpack spraying. This project has been very successful. Ten years of monitoring and continued follow up treatments have yielded a significant decrease in *Phragmites* density and coverage. A diversity of native and rare plant species have colonized areas formerly dominated by *Phragmites*. Emergent areas that were formerly dominated by *Phragmites* are becoming well established with *Spartina patens*, with *Spartina alterniflora* at the pond edge, more diverse emergent communities in depressions, and woody plants interspersed with *panicum* where the marsh borders upland areas of dune. The attached photos document this success.

Outcomes as a result of this project are 1) improved habitat and forage quality of mudflats and native emergent shoreline plant communities for migratory and breeding shorebirds, aquatic life and other wildlife; and 2) restoration of the natural structure, composition and function of the native brackish marsh plant community including its rare plants, and 3) the continued existence of an endemic coastal feature with all its attendant diversity of life as a resource for the Conservancy's purpose with nature education in this location.

Although *Phragmites* is still present in the restoration area, it has significantly declined in density and coverage since the start of the project. Continued vigilance is required, however, because the native emerging marsh community is not able to compete with *Phragmites* without continued management. Therefore, The Nature Conservancy is committed to the long-term management of this salt marsh community and will implement targeted herbicide treatments to sustain long term success of this restoration project. These follow up treatments to missed stands or re-sprouted areas will involve methods on foot using backpack sprayers and hand wicking techniques.

## **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.*

The Nature Conservancy had received a ten-year Assent for this project, which will expire in July 2020. A Maintenance Application Assent is now being prepared by the Conservancy and will be submitted to CRMC. The Conservancy intends to contract with Land Stewardship, Inc or similarly responsible contractor to perform herbicide treatments to *Phragmites* in early September 2020 and September 2021. Since treatment areas are at



a much smaller scale due to prior management, methods need only include low volume backpack sprayer and hand wicking techniques. All methods will be performed on foot using a three-person crew.

Documentation of the effectiveness of the herbicide treatments will continue the following growing season, during summer of 2021 and 2022. The Conservancy will continue its monitoring and evaluation component as part of this project. Photo stations will continue to be utilized to document changes in vegetation structure. The control of *Phragmites* and the re-establishment or restoration of native vegetation will be carefully monitored, documented, and shared with the coastal restoration community as a potential model for future restoration projects.

2020:

- Spring: Obtain CRMC Maintenance Assent, RIDEM Pesticide Permit, and administer contract with Land Stewardship, Inc
- July/August: Monitor results of the 2019 herbicide treatment
- Early September: Conduct herbicide treatment of *Phragmites*

2021:

- April/May: Submit annual progress report to CRMC CEHRTF program
- Spring: Obtain RIDEM Pesticide Permit and administer contract with Land Stewardship, Inc
- July/August: Monitor results of the 2020 herbicide treatment
- Early September: Conduct herbicide treatment of *Phragmites*

2022:

- April/May: Submit annual report to CRMC CEHRTF program
- July/August: Monitor results of the 2021 herbicide treatment
- Evaluate project objectives and cost for future management
- Fall: Submit final report to CRMC CEHRTF program

### 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).*

Because the initial phases of work intent upon eradicating *Phragmites* are complete, there is no longer a need to use an amphibious track vehicle for broadcast spraying. Herbicide application to *Phragmites* will be completed on foot using low volume backpack sprayers and hand wicking methods. There is therefore little likelihood of herbicide damage to non-targeted plants from overspray. Further, there is no concern for future compaction of the marsh from vehicle travel.

The Conservancy will pursue treatment methods that can be directly controlled at small scale, rather than broadcast. Herbicides selected will be permitted on the basis of their safety for use in aquatic conditions. An effort to preserve the band of woody shrubs (bayberry, red cedar, groundselbush) along the upper limit of the marsh will be undertaken to prevent herbicide from compromising the cover this edge provides to birds and other wildlife.

### 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.*

As efforts to manage *Phragmites* at Goosewing Beach have shown success, the Conservancy has been offering guided tours of the project area to interested visitors. Some of these visitors have had an academic interest in the plant life of the emergent community at Goosewing, but most have been local residents seeking to learn what they might expect from engaging in efforts to manage *Phragmites* along the shorelines of coastal ponds and estuaries in their own neighborhoods.

Current efforts to restore the brackish marsh at Long Pond, Little Compton, and at Tunipus Pond, Little Compton, are the direct result of organized neighbors at those two coastal ponds becoming enthusiastic about the prospects for similar success.

Some public concern remains for the use of herbicides within outdoor environments like those presented by the coastal lagoon at Quicksand Pond. Conservancy staff remain current on this topic, and have taken to prescribing the use of only those products which have been shown to be safe.

There has also been concern among some that removal of *Phragmites* from coastal lagoon ecosystems means loss of capacity for water filtration and nutrient sequestration, with the result of compromised water quality in these closed systems. These concerns have been voiced by some at Quicksand Pond, but the water quality within its entire watershed is generally of higher quality than that found at many of Rhode Island's similar coastal ponds. As a safety measure, some neighbors at Quicksand Pond have organized with the Coalition for Buzzards' Bay in order to effect regular water quality testing of pond waters.

Neighbors at Tunipus Pond, just west of Quicksand Pond, organized three years ago with a goal of managing invasive *Phragmites* in this coastal lagoon. Their efforts, which are beginning to show success, are a direct outcome of this restoration effort at Goosewing.

## **5. Economic and Educational Benefits**

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

The restoration project will continue to be used as a learning tool for education programs conducted by the Conservancy at Goosewing to educate visitors about native and invasive species, and to view an appropriately managed restoration project in the works and to observe its outcomes and benefits. It has been the Conservancy's experience that some marshfront landowners in Rhode Island have taken it upon themselves to manage *Phragmites* using over the counter herbicides and without regulatory oversight. Conducting this effort in a responsible manner is part of a broader message about the importance of preserving habitat function in these coastal wetlands.

The restoration of Goosewing's brackish salt marsh has improved wildlife viewing opportunities for visitors to this preserve. Monolithic stands of *Phragmites* can permanently alter historic views and obstruct opportunities to observe water bodies and their dependent life. Reducing stands of *Phragmites* to allow shorter native marsh vegetation has increased visibility and accessibility to visitors to the marsh and pond edge. Continued management of invasive *Phragmites* will allow us to maintain these wildlife viewing opportunities.



Removal of *Phragmites* should improve biodiversity within Rhode Island's coastal habitats by increasing regional plant species diversity and enhancing habitat conditions for invertebrate, fish, and wildlife communities.

According to the State Coastal and Estuarine Habitat Restoration Strategy (Updated: July 2008):

*"Rhode Island is home to an array of coastal and estuarine habitats including salt marshes, seagrass beds, river systems, dunes and barrier beaches. These habitats contribute greatly to the state's biological integrity and diversity by supporting a wide variety of fish and wildlife species. Coastal and estuarine habitats provide economic benefits such as supporting finfish and shellfish stocks. These stocks contribute to the state commercial fishery valued at 75 million dollars, and a recreational fishery valued at 150 million dollars. Coastal habitats also provide scenic beauty and recreational opportunities that are attractive to residents and visitors, as evidenced by a tourism and outdoor recreation industry valued at two billion dollars in Narragansett Bay alone."*

The Conservancy with assistance from RIDEM is managing the breachway at Quicksand Pond by conducting manual breaching at Goosewing beach in the spring and fall to allow for fish passage if the breachway has not opened. This is important for river herring and blue crabs. Both of these species are critically dependent upon quality shoreline habitat containing emergent plant communities.

## **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?*

The endemic plant communities which colonize the shoreline and emergent zones of the coastal lagoon along the barrier beach at Goosewing collectively represent the target habitat of this restoration effort. These communities are known for their high degree of biodiversity, in terms of plant species composition and in terms of other life forms which are supported by these plants. This is the result of specific adaptation to the wide ranges of hydrology, salinity, and soil types which exist in these shoreline areas. Various forbs, grasses and woody shrubs, some long-lived and some ephemeral, occupy niche positions along the water's edge. Conditions along the barrier beach are dynamic, and so the plant communities which colonize this tract shift and modify over relatively short periods of time. For example, locations once dominated by woody shrubs have become dominated by grasses since storm "Sandy", but shrub seedlings (bayberry, marsh elder) have taken hold on new dune deposits. Conversely, the zone at Goosewing which accommodates its Quicksand Pond breach channel has been freed of the stabilizing influence of common reed, and so broad flats have emerged where this channel has begun to meander more widely.

Regardless of the specific composition of these natural communities at any one location, it appears a system of diverse plant communities will ensure the viability of this barrier over time. Because invasive *Phragmites* has the ability to out-compete all other plant species and create a monoculture in this location, managing it has been a priority for the Conservancy. As possible further evidence of the inherent resilience in this native ecosystem, it has been our experience through this restoration effort the endemic species quickly recolonize areas freed of the suppressing effects of *Phragmites*. Restoration of the salt marsh has improved the long-term health of the marsh vegetative community, which may result in increased resistance to storm events.

## **7. 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 Rhode Island Coastal and Estuarine Habitat Restoration Program identifies salt marshes as a priority habitat for state restoration activities. According to the State Coastal and Estuarine Habitat Restoration Strategy (Updated: July 2008):

"Rhode Island salt marshes are found along the shores of salt ponds, the Narragansett Bay estuary, small embayments (such as Allin's Cove in Barrington), and estuarine rivers (such as the Narrow River estuary). Salt marshes provide nursery grounds and foraging habitat for hundreds of species of fish, shellfish, birds, and mammals. Fish of all sizes, from mummichogs to striped bass, feed in creeks and ponds. Quahogs and oysters live beneath the surface, while mussels, fiddler crabs, and snails occupy intertidal areas. Many kinds of birds including osprey, herons, ducks, and mosquito-eating sparrows visit the marsh to feed on the fish and invertebrates and in some cases use the marsh as nesting area. In addition to their habitat value, salt marshes serve as natural pollution treatment systems by filtering out pollutants from upland runoff. Salt marshes between developed coastal communities and coastal waters also provide stormwater storage capacity and absorption of wave energy, helping to mitigate flooding during storms."

Studies completed by the Nature Conservancy over the past 30 years consistently place Quicksand Pond among the top few of Rhode Island coastal lagoon ecosystems in terms of biological diversity and habitat quality. Deferring maintenance of this ecological treasure for future benefit is not an option for the Conservancy or for Rhode Island.

#### 8. 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](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](http://www.rinhs.org/wp-content/uploads/ri_rare_plants_2007.pdf)

There are a number of rare plant species present in the Goosewing Salt Marsh that have already benefited as a result from this ongoing restoration project. Continuing to control the spread of *Phragmites* will allow these species to flourish and to re-establish themselves in other areas dominated by *Phragmites*. Recently, four rare species were observed during 2017-2019 monitoring visits; all are listed as species of Concern in the State of Rhode Island:

- Herbaceous Sea-blite (*Sueda maritima*)
- Atlantic Mock Bishop's Weed (*Ptilimnium capillaceum*)
- Sea-purslane (*Sesuvium maritimum*)
- Saltmarsh Bulrush (*Bolboschoenis maritimus*)

Atlantic Mock Bishop's Weed, Annual Sea-purslane and Saltmarsh Bulrush were found throughout the survey area, all occurring in wet, brackish areas previously dominated by *Phragmites*.

In 2007, a baseline inventory of native plants of Goosewing was completed by Hope Leeson for TNC prior to the start of this restoration project:



Sea Purslane (*Sesuvium maritimum*) – rare, new record for RI  
 Saltmarsh Bulrush (*Scirpus maritimus*, *Schoenoplectus maritimus*) – state species of concern  
 Whorled Milkwort (*Polygala verticillata*) – state species of concern  
 Seabeach Knotweed (*Polygonum glaucum*) – state threatened  
 Mock Bishop's Weed (*Ptilimnium capillaceum*) – state threatened  
 Sea-beach Sandwort (*Honckenya peploides*) – state species of concern

In addition, two rare birds utilize the Goosewing salt marsh and its mudflats for foraging and occasionally nesting: Piping Plover (*Charadrius melodus*) – federally threatened, and Least Tern (*Sterna antillarum*) – state threatened. Reducing stands of *Phragmites* will reclaim exposed mudflat and washout areas near the Quicksand Pond breach channel to increase breeding and foraging habitat for these species.

Other avian species that will benefit from this restoration project include Great Blue Heron, Great Egret, Snowy Egret, and Seaside Sparrow. Each of these species are listed as Concern in Rhode Island.

#### 9. Permitting

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

Immediately following the notice of a grant award, TNC will obtain a Maintenance Assent from CRMC and a pesticide permit from RIDEM. Our current CRMC Assent will otherwise expire in July 2020.

#### 10. 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.

Globally, The Nature Conservancy is working to prevent and control the spread of invasive species in all 50 states and across more than 30 countries around the world. Together with our partners, we are focusing on prevention and early detection as the most effective strategies to combat invasive species. TNC has more than two decades of experience controlling invasive species and lessening their impact on native plants and animals. In Rhode Island, TNC has experience in a number of habitat restoration projects in conservation areas and on its nature preserves:

- Our most recent projects include:
  - Completed a ten year (three phases) habitat restoration efforts of the Goosewing Salt Marsh to reduce *Phragmites* and restore its natural communities.
  - collaboration with, and technical assistance to The Group to Save Long Pond in their effort to manage *Phragmites* and restore a 55-acre wetland tract at Long Pond, Little Compton.
  - We have conducted efforts since 2006 to restore oysters and other shellfish for their habitat functions, working with Save the Bay, Salt Ponds Coalition and a number of other partners.

TNC personnel involved in this project are Cheryl Wiitala, Preserves Manager who is the project manager and John Berg, Sakonnet Landscape Manager.

## 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.*

Since controlling populations of a vigorous invasive like *Phragmites* takes several years of effort requiring follow up treatments, a sustained commitment is planned. Larger, widespread monotypic stands of *Phragmites* have been greatly reduced (and eliminated in most areas) since the start of the project. Follow up spot treatments on foot using backpack sprayers or hand wicking will be the method of treatment going forward. Some re-growth is expected so annual follow up treatments will continue in order to maintain the ecological integrity of the marsh.

The maintenance phase of this project will then be evaluated and decisions made as to its continuation into the future. TNC will seek funds from the CRMC CEHRTF or other funding opportunities to continue this work. Annual long term monitoring through photo stations and vegetation surveys will continue. This funding request by the Conservancy to CRMC's CEHRTF is for direct project costs only and there are no operating or maintenance costs included. With future funding from CRMC's CEHRTF, TNC will continue its maintenance of the Goosewing Salt Marsh to ensure the *Phragmites* does not expand.

### 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?*

Aside from lack of adequate funding to undertake management actions needed to control invasive *Phragmites*, there are no existing external factors that could reduce the chances of achieving the project's goals.

TNC owns Goosewing Beach and its associated coastal marsh habitat outright, and manages the property as a nature preserve. Development along the shores of Quicksand Pond is limited and water quality in this coastal lagoon remains good. TNC and its partners have protected much of the shoreline outright and by means of conservation easements. To date, more than 800 watershed acres critical to the supply of fresh water to the coastal lagoon at Quicksand Pond have been protected. In addition, Goosewing Preserve and associated conservation lands along this barrier system account for an additional 180 acres protected.

The diversity of the endemic plant communities is the result of specific adaptations in wide ranges of hydrology, salinity and soil types. Conditions along the barrier beach are dynamic, and so the plant communities which colonize this tract shift and modify over relatively short periods of time. Ensuring these



native plant communities can remain viable is the first step to ensuring this barrier ecosystem will remain vegetated, even as it may change over time, and move in space.

## 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).*

1. Percent of *Phragmites* reduced
2. Percent increase in native plant community in areas treated – native plants, rare plants
3. Viability or ability of successive native plant communities to thrive, as these become established
4. Increase in wildlife diversity - birds, aquatic life, wildlife
5. Number of acres of restored area (long term)

Performance measures will be recorded through photos documenting presence of native and rare plants in areas where *Phragmites* was removed, photos showing reduction of *Phragmites*, and native and rare plant surveys. In addition, bird surveys may be completed during the project period.

### 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).*

A baseline inventory of native and invasive plants was completed for TNC by botanist Hope Leeson in 2007, and TNC documented pre-treatment conditions of the entire Goosewing salt marsh in 2011. Recently, a follow up comparison survey was completed in 2017 by Carol Lynn Trocki. This survey documented the current vegetative community structure and presence of rare plant species following eight years of *Phragmites* treatment.

Photo stations have been implemented so that changes in vegetation structure can be documented. Photos taken during each year of the project will document the condition of the vegetation structure, presence/absence of rare and native plants in areas where *Phragmites* has been treated.

Annual documentation of the effectiveness of the herbicide treatment will occur the following growing seasons during the spring/summer of 2020, 2021 and 2022 after herbicide treatment. Results will be shared among the landowners at Quicksand Pond and members of the community so TNC can propagate methods and successes of restoring native pond shore plant communities. Annual summary reports of the project will be sent to CRMC.

In addition, The Conservancy will establish a long-term beach profile elevation transects to measure change of the barrier beach over time. We have consulted with Bryan A. Oakley, Ph.D., Associate Professor of

Environmental Geoscience at Eastern Connecticut State University to assist us in setting up two profiles at Goosewing in the spring of 2020. Currently, these profiles are in use on Block Island.



## VII. PROJECT BUDGET TEMPLATE

BUDGET ITEM	CRMC REQUEST	MATCH	MATCH PENDING OR SECURED? (select one)	SOURCE OF MATCH	TOTAL
Project Coordination		\$3,500	secured	The Nature Conservancy	\$3,500
Herbicide Application (contract)	\$6,000				\$6,000
<b>TOTAL</b>	<b>\$6,000</b>	<b>\$3,500</b>		<b>TOTAL PROJECT COST</b>	<b>\$9,500</b>

## 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.*

**Project Coordination:** TNC will provide match in the amount of \$3,500 to cover the cost of project coordination which includes personnel costs (Preserves Manager) for implementation of the project, monitoring, and documentation.

**Herbicide Application (Contract):** TNC requests \$6,000 for contractual work for herbicide application for 2020 and 2021.

## IX. ADDITIONAL MATERIALS

Please include the following with your application:

☒ Site and Locus Maps

☒ 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



**AUTHORIZED SIGNATURE**

**AUTHORIZED AGENT OF LEAD ORGANIZATION**

  
Signature

Date

1/21/2020

Return your completed proposal by 4:00 p.m. on January 23, 2020 to:

**Caitlin Chaffee**  
**RI Coastal Resources Management Council**  
**Stedman Government Center**  
**4808 Tower Hill Road**  
**Wakefield, RI 02879**

[cchaffee@crmc.ri.gov](mailto:cchaffee@crmc.ri.gov)

Applicants are required to submit one (1) signed hard copy 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 **401-783-3370** with any questions.



**Rhode Island Coastal and Estuary Habitat Restoration Fund  
Full Proposal Form 2019/2020**

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

**I. PROJECT SUMMARY**

1. Project Title : *Lower Kickemuit River Dam Removal: Restoring the Ecological Resiliency of the Kickemuit River Estuary*
2. Project Location (include map): *Lower Kickemuit River dam, Warren, RI*
3. Project type (Planning, Design, Construction, Monitoring and Assessment or Other): *Design, Engineering and Permitting*
4. If other, please specify:
5. Habitat type: *Estuary and tidal wetland*
6. If other, please specify :
7. Restoration technique (e.g. re-vegetation, tidal restoration, etc.): *Dam Removal*
8. Total acreage of habitat to be restored : *25.5 acres*
9. Project benefits: *Restoration of estuarine habitat, creation of salt marsh migration corridor and enhancement of anadromous fish passage*
10. Project partners (organizations providing financial or other support to the project): *Rhode Island's Chief Resiliency Officer, Department of Transportation and Save The Bay*
11. ☒ This is an ongoing project that has previously received funds from the CRMC Coastal and Estuarine Habitat Restoration Fund. If yes, year(s) funding was awarded and amount(s): *Bristol County Water Authority received \$75,000 in 2019 for the engineering and permitting of the Upper Kickemuit River Dam removal.*

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**II. PROJECT MANAGER CONTACT INFORMATION**

1. Name: *Pam Marchand, Executive Director*
2. Organization: *Bristol County Water Authority*
3. Address: *450 Child Street*
4. City: *Warren*
5. State: *RI*
6. Zip: *02885*
7. Phone: *(401) 245-2022*
8. Email: *pmarchand@bcwari.com*
9. Property Owner(s): *Bristol County Water Authority*

☒ 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)

BCWA requests \$50,000 from the CEHRTF. If additional funding is available in the CEHRTF, BCWA respectfully requests \$75,000 to complete the survey, design, engineering and permitting of the Lower Kickemuit River dam.

Amount Requested from Trust Fund		\$75,000
Matching Funds	Project Partner(s)	Amount of Match
FY 20 BCWA	Bristol County Water Authority	\$15,150
FY 21 Capital Budget	Bristol County Water Authority	\$55,000
Staff time	Bristol County Water Authority	\$10,000
Staff Time	Save The Bay	\$4,000
TOTAL PROJECT COST		\$ 159,150

### IV. PROPOSAL NARRATIVE (five pages maximum)

#### 1. Justification and Purpose

The Kickemuit River, a tributary to Narragansett Bay, has been impaired by two dams originally constructed as a public water supply for Bristol County Water Authority (BCWA), the regional water supplier for the communities of Warren, Bristol and Barrington, Rhode Island (Figure 1). BCWA discontinued use of the water supply in 2019 since the water supply is impacted by saltwater intrusion and no longer potable (Figure 2). The dams are now obsolete. Currently, the Lower Kickemuit Reservoir experiences periodic saltwater intrusion during moon tides and coastal storms (Figure 2) and will experience more frequent tidal flooding under future sea level rise scenarios. BCWA is now taking steps to secure alternative back-up water supplies that are more reliable and is working with its partners including the Town of Warren, Save The Bay and the State of RI's Chief Resiliency Officer to remove both the Upper and Lower Kickemuit River Dams in Warren, Rhode Island. The dam removals will reestablish the historic tidal regime to this former tidal estuary and create approximately 25.5 acres of estuarine habitat in the lower impoundment (Kickemuit Reservoir) and 13 acres of freshwater wetland habitat in the upper impoundment (Upper Kickemuit Reservoir). The project will restore habitat for estuarine fish species and other aquatic biota and enhance fish passage for diadromous fish to 3 miles of spawning habitat, while reducing flooding of local and state roads during precipitation events.

The Kickemuit River is a tidal estuary below the Lower Kickemuit River Dam (Warren Reservoir Lower Dam - State I.D. 479). The dam, built in 1883 for water supply purposes, prevents the tide from flowing into the impoundment - the Kickemuit Reservoir. The 180-foot earthen dam is 8.6 feet in height. The dam structure includes a 50-foot concrete spillway with two tidal gates (Figure 3). The second dam, the Upper Kickemuit River Dam is approximately 0.8 miles upstream.

The Upper Kickemuit River Dam (Warren Reservoir Upper Dam - State I.D. 480) is an earthen embankment; 965 feet in length and 14 feet in height. The dam was built in 1961 to prevent saltwater intrusion into the Upper Kickemuit Reservoir during coastal storms (Figure 4). A large wetland consisting of open freshwater



emergent wetlands and forested/shrub wetlands exists adjacent to the Upper Kickemuit Reservoir and is predicted to convert to salt marsh or intertidal habitat with sea level rise (Figures 1 and 5).

When BCWA used the impoundments as a water supply, the RI Department of Environmental Management (RIDEM) with funding from NOAA, and other federal and state partners collaborated to enhance fish passage by constructing a fish ladder at the Lower Kickemuit River Dam in 2007. The fish ladder does pass adult river herring, but the population has not recovered as projected since the installation of the fish ladder due in part to brackish water and the shallow nature of the impoundment. Additionally, blocked culverts under the state road downstream of the Upper Kickemuit River Dam and check valves on the flow outlets of the Upper Kickemuit River Dam prevent migratory fish from accessing the upper impoundment and three miles of upstream spawning habitat.

BCWA and its partners are pursuing the removal of both earthen dams on the Kickemuit River and have secured a commitment from the RI Department of Transportation (RIDOT) to raise the elevation and resize the culverts under the state road downstream of the dam. Due to high cost of future maintenance of the Upper Kickemuit River Dam, BCWA prioritized the removal of the Upper Kickemuit River Dam and secured funding for engineering and permitting from the Coastal and Estuarine Habitat Restoration Trust Fund (CEHRTF) and the ratepayers. As part of the engineering, hydrologic modeling has been completed to assess future flooding scenarios with the removal of the Upper Kickemuit River Dam. The modeling predicted that flooding of low-lying roads will be reduced upstream of the dam post-removal, but downstream flooding of Serpentine Road, a town road, along the Lower Kickemuit River impoundment will increase if the lower dam remains. Based upon this analysis, BCWA and its partners decided to coordinate the removal of both dams simultaneously to reduce flooding while restoring estuarine habitat and enhancing migratory fish passage.

Removal of these dams will increase the ecological resiliency of the Kickemuit River by restoring the tidal estuary, increasing both salt marsh and freshwater wetland habitat, improving diadromous fish passage, and restoring the connectivity of this tributary with the estuary. The removal of these obstructions to tidal flow, coupled with anticipated sea level rise, will increase the area for salt marsh re-establishment and future marsh migration. The dam removals will improve habitat for fish and wildlife species. Public access to the river will be enhanced for kayaking, fishing and recreation. Additionally the dam removals will increase community resiliency by reducing flooding of low-lying roads during precipitation events. Combined, these benefits will provide sustainable and lasting ecological benefits and will restore natural ecosystem function to the Kickemuit River.

The short-term outcomes of the dam removals will include restoration of a tidal estuary, enhanced river connectivity, improved fish passage into the upper river for diadromous fish and resident fish species, and increased brackish and salt marsh habitat for estuarine species. A long-term outcome of the dam removals will be an increase in the salt marsh migration corridor in the surrounding wetlands and low lying undeveloped wetlands. Much of the land abutting the impoundments is protected from development and will provide areas for unimpeded coastal marsh migration.

## **2. Project Activities, Schedule and Work Plan**

Since the fall of 2019, BCWA and its project partners have begun to conduct an initial assessment of removing the Lower Kickemuit River Dam. BCWA retained Pare Corporation (Pare) to conduct a storm surge analysis, flooding scenario from precipitation events, drinking water well assessment and sediment sampling. The storm surge analysis determined that the Lower Kickemuit River Dam provides no coastal flood mitigation benefits to the community surrounding the impoundment under existing and future



scenarios. The modeling of 50 and 100 year precipitation events determine that removal of the Lower Kickemuit River Dam reduces flooding along the impoundment. The assessment of the dam removal on private drinking water wells adjacent to the lower impoundment recommended further analysis of two wells closest to the impoundment. A preliminary sediment assessment behind the dam was conducted. Two composite samples were collected behind the dam and elevated copper was found in one of the samples due to past treatment of the drinking water supply. The level and extent of sediment contamination did not preclude pursuing dam removal. Further sediment sampling will occur during the engineering phase of the project.

BCWA will retain Pare, the consultant conducting the engineering of the Upper Kickemuit River Dam removal, to conduct the comprehensive sediment assessment including quantity and sediment characterization, the bathymetric survey, additional well testing and assessment of the two wells, engineering and the engineering and permitting of the Lower Kickemuit River Dam. BCWA and its engineer will coordinate the engineering of the Lower Kickemuit River Dam with the final engineering of the Upper Kickemuit River Dam removal and the sizing of the culverts under the state road with RIDOT. To date, Pare has developed 30% plans for the Upper Kickemuit River Dam removal with funding from CEHRTF, and RIDOT is hiring an engineer to design and permit the Schoolhouse Road raising and culvert resizing. The project partners, including the State's Chief Resilience Officer, is coordinating efforts with RIDOT staff to ensure that the Schoolhouse Road upgrade is coordinated with the dam removal.

While conducting the design of the Upper Kickemuit River Dam removal over the last year, BCWA has taken steps to build redundancy into their water system by increasing the interconnection capacity with East Providence's water supply to allow each water supplier increased capacity during an emergency situation. BCWA is in the final design phase for a larger interconnection to access an alternative back up water supply in Pawtucket.

The permitting of the two dam removal projects will occur simultaneously in 2020 and 2021. The construction of the Lower and Upper Kickemuit River Dam removals will occur after RIDOT raises Schoolhouse Road and replaces its culverts scheduled for the summer of 2021. Once DOT's Schoolhouse Road project is complete, dam removal construction can begin and is targeted for the fall of 2021 or the summer of 2022

**Engineering and Permitting Project Timeframe:** BCWA expects that the engineering and permitting phase of the project will be completed within approximately a 16-month time frame.

April 2020 – May 2020: review project scope and outline steps to complete engineering; conduct bathymetric survey, sediment quantification and sediment testing, commence designs based on sediment characterization, tidal influences with removal of structure and verification of habitat; conduct pre-application meeting with RIDEM and CRMC;

June 2020: hold public meeting on Lower Kickemuit River Dam removal; review 30% design with project partners and incorporate partners' comments; advance design towards 60% submission

September 2020: hold another public meeting to present 60% of Lower Kickemuit River dam designs;

September 2020: Submit engineering designs and permit package to permitting agencies;

March 2021: Submit annual report to CRMC;

July - August 2021: finalize designs with comments from permitting agencies; complete 90% design development; submit final report to CRMC.



### **3. Minimization of Adverse Impacts**

During this phase of the project, the engineering and permitting, we do not anticipate any potential site impact. During the construction phase, BCWA will comply with all permits as to time of year restrictions for anadromous fish and estuarine species. Additionally, assessments will be conducted of potential impacts on wells adjacent to the lower impoundment.

### **4. Public Support**

BCWA formed a steering committee in 2016 including the Town of Warren, Kickemuit River Council, the Town of Swansea's Conservation Agent, Save The Bay, and the Chief Resilience Officer to assist with the dam removal planning, design and public outreach. Multiple meetings have been held with the committee since 2016. In fall of 2019, BCWA hosted a meeting with committee members and for abutters of the Lower Kickemuit River impoundment, during which time the dam removal concept was presented. BCWA has shared information with the Town of Warren about BCWA's plans to remove the Lower Kickemuit River Dam. The Town of Warren has been a partner with BCWA on securing support from DOT to upgrade Schoolhouse Road and its culverts and on the planning for the Upper Kickemuit River Dam removal.

BCWA will continue to work with Save The Bay and the Steering Committee to share the results of the dam removal designs with the broader community including the residents of Warren, RI, the ratepayers in the water supply area and local watershed and fishing groups. At least two public meetings will be held during the assessment and engineering phase of the project to share additional data collected by the engineer and to share the 30% designs with abutters and the public.

The Chief Resilience Officer has highlighted this project as a model resiliency project that requires interagency coordination of multiple state agencies (RIDOT, RIDEM, and Department of Health), a water supplier (BCWA) and a municipality (the Town of Warren). Save The Bay has been working with BCWA over the last three years on outreach to residents in the service area and the three municipalities. Meetings have been held in Warren and Barrington to date. Save The Bay worked to highlight the adaptation project and to receive coverage in a Providence Journal article about coastal water supply vulnerability in the spring of 2019. Save The Bay has highlighted this resiliency project in its *Tides* Magazine and will continue to cover this project in future issues of *Tides*, through social media and outreach to the press. The BCWA will update customers on their web site, in future mailings, and in local newspapers. All communication by BCWA, Save The Bay and other partners will include acknowledgement of CRMC's CEHRTF financial support.

### **5. Economic and Educational Benefits**

BCWA is committed to minimizing long term repair and maintenance costs of an obsolete dam. Annual maintenance and insurance costs of the dam would no longer have to be incurred if dam removal is pursued. The estimated cost of maintaining the Lower Kickemuit River Dam is approximately \$15,000 annually. Additionally, a spillway upgrade could be required under proposed regulation changes and the cost of this corrective work could be an additional \$250,000 to \$400,000 if required.

This project will highlight to the public specific adaptation strategies that can be implemented to restore estuarine habitats and adapt to changing conditions due to climate change. Additionally the dam removal will enhance public access by reconnecting the estuarine section of the Kickemuit River with the upper watershed. Presently the area is restricted to public access as it has been a designated watershed for the BCWA backup drinking water supply. However, once an alternate supply is obtained, the area is intended to be opened for low impact public recreation such as fishing and kayaking. BCWA and project partners will



work with the Warren Land Conservation Trust and the Kickemuit River Watershed Council to assess potential public access improvements including kayak and fishing access to the river.

## **6. Climate Change and Coastal Resiliency**

This dam removal project provides an innovative model for reducing community vulnerability due to accelerated sea level rise and increased precipitation events while enhancing brackish and estuarine habitats and will be the first of its kind in Rhode Island, serving as an example for other coastal water supplies. Removal of the dam will provide community resiliency benefits by increasing flood storage capacity and reducing flooding of low-lying infrastructure during precipitation events.

Based upon the RI Coastal Resources Management Council's (CRMC) Sea Level Rise Affecting Marshes Model (SLAMM) assessment, the bordering uplands along the lower impoundment and approximately 70 acres of freshwater wetlands adjacent to the upper impoundment are projected to convert to salt marsh or estuarine habitat with sea level rise (Figure 5). The marsh migration corridor is one of the largest undeveloped areas for marsh migration in the Narragansett Bay watershed and will increase ecological and coastal resiliency. The majority of the land adjacent to the upper impoundment where the marsh migration corridor exists are protected with conservation easements or owned by the Town of Warren and BCWA (Figure 6).

## **7. Planning Consistency and Restoration Priority**

Multiple federal agencies have identified this restoration project as both a regional and local priority. NFWF's Coastal Resilience Assessment of the Narragansett Bay and Coastal Rhode Island Watershed identified the Kickemuit River dam removals as a case study for a NOAA-funded project that would increase both ecological and community resilience. The project is consistent with NOAA program priorities of restoring habitat to strengthen the resilience of coastal ecosystems and decrease the vulnerability of coastal communities to extreme weather events and climate-related hazards. The Atlantic Coastal Fish Habitat Partnership, a consortium of resource managers, scientists, and conservationists from 35 different state, federal, tribal, and non-governmental recently endorsed the Kickemuit dam removal project.

At the state level, the project meets the goal of four state reports including the State of RI's Resilient Rhody Report, RI Department of Health's 2013 Safe Water RI Report, CRMC's SLAMM Summary Report, and the Rhode Island Wildlife Action Plan which outlines dams as modifications to natural systems. 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. Removal of the dam along with the replacement of the blocked Schoolhouse Road culverts and the removal of the Upper Kickemuit River Dam will remove vulnerable infrastructure and enhance coastal resilience on the Kickemuit River. The RI Department of Health identified the vulnerability of the BCWA's drinking water supply in a [2013 Safe Water RI Report](#). Removal of both Lower and Upper Kickemuit River Dams support BCWA's ongoing activities to secure a safe and sustainable backup water supply for the residents of Bristol County, RI. The recommendations in CRMC's *Rhode Island Sea Level Affecting Marshes Model Project Summary Report* include removing obstructions such as dams, enlarging culverts and raising roadways to promote coastal wetland migration. In RIDEM's *Rhode Island Wildlife Action Plan*, dams as modifications to natural systems are highlighted as threats to wildlife. Climate change including sea level rise, increased temperature and increased precipitation intensity can exacerbate the effects of these existing threats. Increase of spawning habitat for anadromous fish through removing impediments to fish passage as outlined in the *Strategic Plan for the Restoration of Anadromous Fish to RI Coastal Streams*.



## 8. Species of Concern

Restoring estuarine habitat will benefit forage fish species such as mummichog (*Fundulus heteroclitus*), Atlantic silverside (*Menidia menidia*), striped killifish (*Fundulus majalis*), sheepshead minnow (*Cyprinodon variegatus*) and Atlantic menhaden (*Brevoortia tyrannus*). Enhancing forage fish habitat will benefit numerous commercial and recreational finfish species including summer flounder (*Paralichthys dentatus*), black sea bass (*Centropristis striata*), scup (*Stenotomus chrysops*), striped bass (*Morone saxatilis*), and bluefish (*Pomatomus saltatrix*). This restoration project coupled with the replacement of the blocked culverts under Schoolhouse Road and the removal of the Upper Kickemuit River Dam will enhance fish passage by removing the dam at head of tide allowing diadromous fish species including blueback herring (*Alosa pseudoharengus*), alewife (*Alosa aestivalis*), and American eel (*Anguilla rostrata*) unobstructed access to spawning habitat in the upper Kickemuit River.

Restoring tidal wetland habitat and creating a marsh migration corridor will have a long term benefit to bird species that nest in salt marshes including the salt marsh sparrow, (*Ammodramus caudatus*), the seaside sparrow (*Ammodramus maritima*) and the willet (*Tringa semipalmata*). Existing salt marshes cannot keep pace with accelerated sea level rise and are beginning to drown in place. Providing areas for salt marshes to migrate inland is crucial for the protection of species that rely on the salt marsh platform for nesting habitat. The restored estuary will provide feeding habitat wading birds and shorebirds during the breeding season and migration.

## 9. Permitting

Once the engineering is complete, the project permitting will be coordinated with RIDEM and CRMC since it will involve both freshwater wetlands and coastal resources. In addition, the US Army Corps of Engineers (ACOE) will have jurisdiction under Section 10 and Section 404. The work is expected to meet the General Permit for Rhode Island (GP 10. Aquatic habitat restoration, establishment and enhancement activities). Prior to submittal, the engineering plans will be reviewed with DEM's Division of Dam Safety and Division of Fish and Wildlife

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

**Bristol County Water Authority:** This project will be led by Pam Marchand, Executive Director of the BCWA. Pam brings 32 years of water utility leadership experience to this project. She has overseen numerous construction projects, including similar watershed projects such as the renovation of the Anawan Dam in MA. Ken Booth, Operations Manager of the BCWA, will work with the engineering firm on the design review and coordinating survey and additional field activities.

**State of Rhode Island's Chief Resilience Officer:** Shaun O'Rourke, Chief Resilience Officer, will lead the coordination of state agencies including RIDOT, RIDEM, DOH and the Infrastructure Bank during the design, engineering and implementation phase of the project.

**Save The Bay: Wenley Ferguson,** Restoration Coordinator, will collaborate with BCWA on project coordination, securing funds for project implementation and community outreach.



## **V. SUSTAINABILITY (one page maximum)**

### **1. Maintenance:**

The removal of the Lower Kickemuit River Dam will be designed to require little or no maintenance. While some portions of the earthen berm will remain, the project site will be stable and fish and other estuarine species will be able to pass freely where the former dam was located. The estuarine habitat type to be restored is one that is adaptive and resilient to ecosystem shifts. There may be short term adaptive management such as wetland plantings required for restoring tidal wetlands in the area of the impoundment once the dam is removed. As the exposed banks are colonized with wetland vegetation, the vegetation should be sustainable. Project partners will be involved in monitoring the recolonization and identifying invasive plants that may recolonize the restored area. Any long term maintenance to earthen berm will be the responsibility of BCWA in coordination with the RIDEM Division of Dam Safety.

### **2. External Factors**

Most of the land adjacent to the two impoundments is protected by conservation easements (Figure 6). Along the lower impoundment, some of the land is privately owned adjacent to Serpentine Road and just upstream of the dam on the left bank. The Town of Warren has been partnering with the Warren Land Conservation Trust, Save The Bay and the Natural Resources Conservation Service to protect additional lands through conservation easements in the Kickemuit and Palmer River watersheds. Partners are collaborating to protect these marsh migration corridors through easements or direct purchase to provide more protected areas for salt marsh migration.

Project partners are also working with the Town to address stormwater runoff from Serpentine Road. Stormwater runoff from Serpentine Road has been identified as a source of pollutants to the Lower Kickemuit Reservoir by RIDEM's TMDL. The Town of Warren is working on designing and implementing stormwater management practices to infiltrate and treat the runoff.

## **VI. EVALUATING PROJECT SUCCESS (one page maximum)**

### **1. Performance Measures**

The success of this project will be measured by the amount of estuarine habitat restored including tidal wetlands and tidal creeks, the ability of fish to migrate past the former obstruction and the reduction in flooding. The bathymetric surveys, as-built plans and post construction field assessments will be used to determine tidal wetland habitat restored. Pre and post project monitoring will take place to determine numbers of returning fish. The Town of Warren, RIDOT and BCWA staff will conduct post construction field visits and document conditions of low lying roads during significant precipitation events to assess the reduction of flooding.

### **2. Monitoring Plan**

During this planning and design phase of the project, monitoring will not occur.

During the implementation stage of the project, the BCWA and its project partners will monitor the hydrologic modifications using topographic and bathymetric surveys, restoration designs and as-built surveys to assess the restored estuarine habitat. Pre- and post-restoration water level monitoring will be conducted by installing water level loggers in the tidal estuary, upstream of both the Lower and Upper Kickemuit River Dams. RIDEM's Division of Fish and Wildlife currently assesses the fish run each spring and will work post-dam removal with project partners to conduct qualitative presence/absence monitoring at the culverts under Schoolhouse Road. Photo stations will be established at each of the impoundments to

assess revegetation post dam removal. If safe access to the tidally influenced riverbanks and floodplain is feasible, post-construction, BCWA and Save The Bay will monitor marsh vegetation reestablishment.



## VII. PROJECT BUDGET TEMPLATE

BUDGET ITEM	CRMC REQUEST	MATCH	MATCH PENDING OR SECURED? (select one)	SOURCE OF MATCH	TOTAL
Survey, sediment assessment, well testing, design, engineering, permitting and bid documents of the Lower Kickemuit River Dam removal	75,000	55,000	secured	FY '21 Bristol County Water Authority Capital Budget	\$130,000
H and H assessment of lower dam, Initial sediment testing, coastal surge modeling and identification and assessment of private wells adjacent to the lower impoundment		\$15,150	secured		\$15,150
Project oversight; design review		\$10,000	secured	Bristol County Water Authority Staff time	\$10,000
Project outreach; grant/report writing		\$4,000	secured	Save The Bay	\$4,000
<b>TOTAL</b>				<b>TOTAL PROJECT COST</b>	<b>\$159,150</b>

## VIII. BUDGET NARRATIVE (one page maximum)

Line 1: The total cost for survey, design, engineering and permitting is \$130,000. The BCWA has secured \$55,000 cash from BCWA's FY 2021 Capital Budget to match the CEHRTF request. If not all of the funding is secured from CRMC, BCWA can dedicate additional funds from their FY '22 budget for final designs based on permitting agencies' comments.

Line 2: The total cost for hydrologic and hydraulic assessment of lower dam, Initial sediment testing, coastal surge modeling and identification and assessment of private wells adjacent to the lower impoundment is \$15,150. BCWA has secured funding for these dam removal assessment costs.

Line 3: The Bristol County Water Authority staff including the Executive Director, the Chief Engineer and the maintenance staff will provide in-kind staff time valued at \$10,000. Pam Marchand, the Executive Director, will be responsible for project oversight and coordinating the project team and public outreach. The Chief Engineer, Ken Booth, will be responsible for coordination with the engineer, oversight of surveys and participation on project team. Maintenance staff will assist with site access for the survey.

Line 4: Save The Bay staff, Wenley Ferguson, will provide in-kind staff time including collaboration with partners on project design, public outreach, partner coordination and grant writing.

### IX. ADDITIONAL MATERIALS

Please include the following with your application:

- ☒ Site and Locus Maps
- ☒ 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

**AUTHORIZED SIGNATURE**

**AUTHORIZED AGENT OF LEAD ORGANIZATION**

*Paula H. Marchant*  
Signature

1/23/20  
Date

Return your completed proposal by 4:00 p.m. on **January 23, 2020** to:

**Caitlin Chaffee**  
**RI Coastal Resources Management Council**  
**Stedman Government Center**  
**4808 Tower Hill Road**  
**Wakefield, RI 02879**

[cchaffee@crmc.ri.gov](mailto:cchaffee@crmc.ri.gov)

Applicants are required to submit one (1) signed hard copy 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 **401-783-3370** with any questions.



**Rhode Island Coastal and Estuary Habitat Restoration Fund  
Small Project Proposal Form 2019/2020\***

\*This application form may be used for projects whose total cost is less than \$5,000.

**I. PROJECT SUMMARY**

1. **Project Title :** Third Beach Dune Habitat Restoration
  2. **Project Location (include map):** 830 Third Beach Rd, Middletown Rhode Island. Site encompasses Norman Bird Sanctuary's Conservation property-sandy beach and dune – along Third Beach in Middletown.
  3. **Project type** Restoration (Dune Habitat Vegetation)
  4. **If other, please specify:**
  5. **Habitat type** Coastal Upland (Dune and sandy shoreline)
  6. **If other, please specify :**
  7. **Total acreage of habitat to be restored :** +/- 1 acre
- 

**II. PROJECT MANAGER CONTACT INFORMATION**

1. **Name:** Joseph McLaughlin
2. **Organization:** Norman Bird Sanctuary
3. **Address:** 583 Third Beach Rd
4. **City:** Middletown
5. **State:** RI
6. **Zip:** 02842
7. **Phone:** 401 846-2577 ext 12
8. **Email:** jmclaughlin@normanbirdsanctuary.org
9. **Property Owner(s):** Norman Bird Sanctuary

☒ The applicant can document ownership of project site or permission to perform all proposed restoration, maintenance and monitoring activities (Proof of ownership or property owner permission will be required as part of the full project proposal.)

### III. PROJECT DESCRIPTION

#### 1. Justification and Purpose

*In 2003, Norman Bird Sanctuary purchased and permanently protected from development a 23-acre parcel located between Third Beach Road and the Sakonnet River, comprising sensitive beach, dunes, marshland, and grassland. This project addresses the dunes ecosystem at Third Beach. The ecosystem has benefitted from projects to remove built structures and plant native vegetation, including a 2007 CRMC-funded project to create a sand berm, build a designated footpath, and plant native vegetation. In 17 years, the dunes have developed into an extraordinarily healthy habitat, characterized by diverse and well-established native vegetation, with documented nesting of threatened piping plovers. The area suffers significant erosion impacts, particularly as a result of human foot traffic from beachgoers taking shortcuts over the dune instead of using established public access points. This increasingly rare and thriving coastal ecosystem also is subject to coastal erosion as a result of sea level rise and the increased frequency, duration, and intensity of storms, including wind and water erosion, storm surge, runoff, and coastal flooding.*

*The proposed native plant restoration project seeks to improve coastal resiliency and restore native ecosystems, species, and biodiversity, and counteract erosion. NBS will re-plant eroded areas, create vegetative barriers to future foot traffic, and install new conservation-themed signage identifying sensitive habitats and directing visitors to nearby public access points. Native plantings will restore the frontal zone with sea grass and other native plants to fill in current eroded human pathways and other bare-sand gaps in vegetation. The project also will include replanting of the back dune zone, where diverse native vegetation is well-established, but where human foot traffic over the dunes has eroded wide un-vegetated paths and created open sand areas that have eroded several feet below vegetated areas.*

#### 2. Project Activities, Schedule and Work Plan

The project is scheduled to begin during the month of April, 2020. Norman Bird Sanctuary's Properties Director and Land Technician will create a planting plan, purchase plants, and lead a team of volunteers to fill vegetation gaps at the frontal zone, and back dune zone, of our Third Beach conservation property. Native planting plans for the dunes' frontal zone will emphasize 1) Filling in gaps in existing dune grass plantings due to erosion and human foot traffic; and 2) Planting vegetation where footpaths have been worn through vegetation with subsequent erosion consequences. Frontal zone plants will include (CRMC Coastal Plant Guide) Sea Coast Bluestem, Shad bush, Salt bush, American Beach grass and Atlantic White cedar. The Cedar is currently thriving in parts of this dune habitat.

Secondary dune plantings will include Bay Cedar, Beach Plum, Service berry and sweet pepper bush. These will fill eroded areas crossing the dunes, areas where footpath erosion has been expanded by wind, and multiple entry pathways from Third Beach Road with a goal of removing any visual cues that would indicate easy access by foot. New signage along Third Beach Road will identify the site as sensitive habitat and provide clear direction to designated access paths. All restoration work will follow the comprehensive management plan for the site and will be aligned with the Comprehensive Conservation Plan of the



neighboring Sachuest Point National Wildlife Refuge, along with project goals of the Sachuest Bay Resiliency Project partnership.

### 3. Coastal Resiliency

*The project will enhance resiliency of this vulnerable coastal area from sea level rise and storm events. Native plantings will help anchor the dune system and reduce vulnerability to erosion from wind, rain, and flooding. Restoration of vegetation in disturbed areas will help prevent overwash and storm damage to the dunes as well as sensitive adjacent saltmarsh and grassland and Third Beach Road. In this dune system, a product of sand deposits from wind and wave action, foot-traffic access points serve as "funnels" for storm surge to access the dunes and also back-dune sites, resulting in a continuing loss of dune structure. Filling eroded areas with vegetation, and deterring 'shortcut' foot traffic, will protect the dunes as high-quality habitat and as natural filters for clean water and barriers to storm impacts for upland areas.*

### 4. Additional Documentation

Maps and Photos attached.

## IV. PROJECT BUDGET TEMPLATE

BUDGET ITEM	CRMC REQUEST	MATCH	MATCH PENDING OR SECURED?	SOURCE OF MATCH	TOTAL
Staff labor, planning, management, implementation		\$3374	Secured	Norman Bird Sanctuary	\$3374
Volunteer labor planting	\$1852	\$1526	Secured	Norman Bird sanctuary	\$3378\
Materials, supplies, Signage	\$3048		Pending		\$3048
<b>TOTAL</b>				<b>TOTAL PROJECT COST</b>	<b>\$9800</b>

## V. BUDGET NARRATIVE

3 of 5

*Please provide a description and justification for each line item included in the project budget form.  
Please specify any match requirements for each source of funding.*

*The Norman Bird Sanctuary is committed to providing staff time and capacity to this project. Anticipated needs include: planning, labor, management and implementation at a total cost of \$3374.*

*In addition to NBS staff, we anticipate volunteer time and labor with 10 volunteers working three four hour days at a standard federal rate of \$25.43 per hour for a total equivalent of \$3378.*

*A Plant material list was generated using the Rhode Island Coastal Plant guide. Some additional hand tools for planting will be purchased as well as dune signage to educate the public on the sensitive habitat at a total cost of \$3048.*



**Rhode Island Coastal and Estuary Habitat Restoration Fund**  
**Full Proposal Form 2019/2020**

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

**I. PROJECT SUMMARY**

1. **Project Title:** Improving Fish Passage at the Belville Fish Ladder
2. **Project Location (include map):** North Kingstown
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:**
7. **Restoration technique:** Fish passage improvement
8. **Total acreage or miles(river systems) of habitat to be restored, or project area planning unit size**  
Improve diadromous fish access to 170 acres of spawning and rearing habitat
9. **Project Benefits:** Improve upstream and downstream passage for the diadromous fish runs in the Annaquatucket River Watershed. Increase the size of the sustainable population and eventual supply of forage species to recreational and commercial fish in the Annaquatucket River Watershed, Lower Narragansett Bay, and Rhode Island Sound.
10. **Project Partners:** Rhode Island Department of Environmental Management, Division of Fish and Wildlife, USFWS Coastal Program, NOAA Coastal Restoration Center, and the 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? If yes, year(s) funding was awarded:**

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**II. PROJECT MANAGER CONTACT INFORMATION**

1. **Name:** John F. O'Brien
2. **Organization:** The Nature Conservancy In Rhode Island
3. **Address:** 159 Waterman Street
4. **City:** Providence
5. **State:** RI
6. **Zip:** 02906
7. **Phone:** 401-331-7110 x4526
8. **Email:** [jobrien@tnc.org](mailto:jobrien@tnc.org)

**Property Owner(s):** The property is owned by the Town of North Kingstown. DEM has an easement to maintain the fish ladder.

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

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### III. BUDGET SUMMARY

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

Amount Requested from Trust Fund		\$70,000
Matching Funds	Project Partner(s)	Amount of Match
	TNC (In-kind)	\$15,000
	DEM/Fish and Wildlife (In-kind)	\$10,000
	TNC	\$45,000
	TOTAL PROJECT COST	\$140,000

### 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.*

The Annaquatucket River watershed is located in the Town of North Kingstown. This small coastal watershed flows into Bissels Cove, located in the West Passage of Lower Narragansett Bay. The Belville Fish Ladder is one of four concrete Denil fish ladders located in the watershed. The Belville Fish Ladder is the



third of the four ladders and was constructed during the late 1960's. Figure 1. Shows a map of the watershed with location of the Hamilton Fish Ladders and the three additional ladders upstream. There is a total of 170 surface acres of spawning and nursery habitat for diadromous fish distributed among the various millponds sections of stream located upstream in the watershed. Estimates indicate that this would support 150,000 spawning adult returns of river herring to the watershed. Returns of spawning fish were very strong during the 1970's and 1980's providing an abundant supply of juveniles to the marine waters of Rhode Island. Unfortunately over the last 15 years there has been a steady decline of returns to the watershed. During the fall of 2019, with funding from RICEHRTF, improvements were made to the Hamilton fish ladder as the first step in addressing a watershed wide initiative in restoring the fish run. A small concrete weir was constructed at the entrance to the Hamilton ladder and a rock weir was installed at the end of the staging pool in order to increase the water surface elevation at the base of the ladder entrance. Each of the upstream ladders have been inspected and surveyed. The Belville fish ladder has been selected as the next ladder in the watershed to be improved.

## **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.*

The USFWS Fish Passage Engineering Group is under contract with the Nature Conservancy and conducted the inspection and survey of the Belville ladder (see attached report, survey summary, and recommendations submitted by USFWS 10/31/2019). Results of the survey work indicate that there is a lack of appropriate depth at the entrance channel. The surveyed elevation of the entrance of the ladder is 1' higher than the actual design elevation. In addition, there is a 2' differential between the design (originally dredged) elevation of the staging pool downstream of the ladder and the current elevation of the pool, indicating that it has filled in with 4-6 inch cobble.

The recommendations to immediately rectify the situation includes installing a set of rock weirs downstream of the existing entrance to provide proper depth between the stream channel and the ladder. A copy of the summary report with recommendations from USFWS, along with schematics of existing and proposed conditions is attached.

A summary of specific responses to comments, concerns, and requests made by the RICEHRTF Pre-proposal Review Committee is also attached.

## **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).*

These activities are modifications to the existing concrete ladder and restructuring the downstream end of the staging pool. The work will be done during the low water period in late summer/early fall of 2020 and will not interfere with the spring run.

**Rhode Island Coastal and Estuary Habitat Restoration Fund  
Full Proposal Form 2019/2020**

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

**I. PROJECT SUMMARY**

1. **Project Title:** Reducing Coastal Erosion Using Nature-based Infrastructure at Rosa Larisa Park, East Providence.
  2. **Project Location (include map):** East Providence
  3. **Project type (Design, Construction or Other):** Construction
  4. **If other, please specify:**
  5. **Habitat type (River System, Salt Marsh, Seagrass, Shellfish Bed, other):** Other
  6. **If other, please specify:** Coastal Bluff
  7. **Restoration technique:** Using nature-based coastal infrastructure to arrest and stabilize eroding coastal bluffs.
  8. **Total acreage or miles(river systems) of habitat to be restored, or project area planning unit size**  
Restore 100' of an eroding coastal bluff.
  9. **Project Benefits:** This project will test the effectiveness of using nature-based solutions to address coastal erosion that is impacting a public facility in East Providence.
  10. **Project Partners:** Rhode Island Coastal Resources Management Council, 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:
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**II. PROJECT MANAGER CONTACT INFORMATION**

1. **Name:** John F. O'Brien
2. **Organization:** The Nature Conservancy In Rhode Island
3. **Address:** 159 Waterman Street
4. **City:** Providence
5. **State:** RI
6. **Zip:** 02906
7. **Phone:** 401-331-7110 x4526
8. **Email:** [jobrien@tnc.org](mailto:jobrien@tnc.org)



**9. Property Owner(s):** The property is owned by the City of East Providence. The City is working closely with TNC and CRMC.

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		\$40,000
Matching Funds	Project Partner(s)	Amount of Match
	TNC	\$55,000
	TOTAL PROJECT COST	\$95,000

### 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.*

Rosa Larisa Park is located in the City of East Providence. This public park is bordered by a steep bluff and overlooks Upper Narragansett Bay. This city owned property is subject to high energy tidal and wave action causing bluff erosion which threatens both the adjacent residential properties and the public recreational facilities of the park. Through a TNC/NOAA funded regional comprehensive study, this site has been selected by staff at the Rhode Island Coastal Resources Management Council as one of the candidates for design, permitting, and construction to test the effectiveness of nature-based coastal infrastructure practices to restore coastal bluff erosion in New England. A design team including staff from TNC and CRMC, as well as coastal restoration engineers and construction project managers who are under contract with TNC, have proposed the following two practices to mitigate the bluff erosion at the park:

- 1) At the southern section: Creating an intertidal rock sill and salt marsh habitat at the base of the steep bluff, and
- 2) At the northern section: Removing vegetation on the steep bluff and installing toe protection rock at the base with cabled coir fiber rolls and vegetation on the existing grade.

Because of construction budget shortfalls, the NOAA study will only be able to implement the first practice at the southern section of the bluff "Intertidal sill and marsh habitat". In order to complete this study with

using both of the bluff restoration practices we are requesting funding from RICEHRF to partner with additional funding that will be raised by TNC

## **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 include applying and testing two nature based solutions to reducing the risk of coastal bluff erosion as well as protecting infrastructure and habitat. Both of these practices have been designed to use natural material and native vegetation as an effective means to protect eroding bluffs.

Construction-ready designs, and permits have been completed for both of the coastal erosion protection practices. SumCo Environmental Inc is under contract by TNC to complete the construction work on the Southern Section of the bluff (Intertidal sill and marsh creation) during the winter months of 2020.

Pending the acquisition of RICEHRF funding, construction for the Northern Section of the bluff (cabled coir fiber rolls and rock toe) will take place during April of 2020.

A complete set of drawings and specifications detailing the work, for both of the bluff restoration practices, has been attached.

Reports will be submitted post construction. The response to the implementation of these habitat restoration practices will be evaluated over a five year period.

## **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).*

In order to minimize impact on living marine resources, the construction of the intertidal marsh sill and low marsh fill at the southern restoration site will take place during the month of January 2020. The work for restoration of the northern site, which is outside of the intertidal zone, will start in April 2020.

## **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 coastal bluff protects Rosa Larissa Park, a City of East Providence public facility. TNC and RICRMC have been working closely with the City. The City has strongly supported this work and has made City Engineers available to assist with project design, logistics for staging and construction, as well as preparation of post construction as-built documents.

**Education and Outreach:** The construction of both of this test practice will be carefully documented. A five year monitoring plan will be in place. Interpretive signage will be installed at the site to inform the



public. Presentations for respective web pages and social media sites will be developed. Monitoring of response conditions at both sites will continue and will be shared with practitioners throughout coastal New England who are working with nature-based coastal infrastructure solutions to erosion.

#### **5. Economic and Educational Benefits**

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

The application of using nature-based coastal infrastructure (natural materials and native vegetation) to reduce the bluff erosion problems at Rosa Larisa Park will begin to educate Rhode Island communities and landowners on alternative, and potentially less expensive ways to address coastal storms and flooding, while restoring or allowing coastal habitat function to continue.

#### **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?*

Coastal flooding and erosion in New England pose a significant threat to private and public infrastructure safety and welfare, and economic, cultural and natural resources. Sea level rise and more frequent severe weather events will intensify these threats in coming years and decades. Coastal communities depend on intact shoreside and nearshore habitats to buffer against these challenges, while also benefitting from the ecosystem services provided by those habitats. This project will help prioritize nature-based coastal infrastructure as a tool to help build resilience while enhancing ecosystem function.

#### **7. 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 Rhode Island Coastal Resources Management Council (RICRMC) as well as other CZM agencies in coastal New England states are seeking to increase community resilience and reduce risk to people, infrastructure, and habitat from coastal flooding and storm erosion while maintaining or enhancing coastal ecosystem function through successful application of nature based coastal infrastructure. The information and results of this restoration efforts at Rosa Larisa Park will inform and provide guidance and guidance documents to restoration practitioners, coastal communities, and CZM agencies, on the potential to use green infrastructure techniques to arrest eroding shorelines caused by flooding and high energy impact from wave and currents.

#### **8. 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](http://www.rinhs.org/wp-content/uploads/ri_rare_plants_2007.pdf)

NA

#### **9. Permitting**

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

All appropriate permits are in place.

#### **10. 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. Projects have included dam removal, nature-like fishways, dredging, marsh restoration, and culvert replacements to enhance tidal flow. 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 Rosa Larisa 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 coordinated capital construction projects.

### **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 lifespan of these planned restoration activities will be determined as TNC continues to monitor, over time, the two applications of nature-based infrastructure to reduce coastal shoreline erosion.

#### **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?*

Not applicable

## **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).*

The monitoring will be completed by CRMC and TNC staff and will be conducted for a period of five years post construction.

#### **1. Visual Inspection and Photo Documentation:**

Photo stations will be set up in both the treatment and a control area. They will be located using RTK-GPS. The photo angles and camera height will be assigned and data will be recorded. Photos will be taken on a continuous basis as well as significant storm events and during peak growing seasons.

#### **2. Vegetation Surveys:**

Vegetation surveys will be completed after planting and done annually after peak growing seasons (August through September). The vegetation monitoring will include percentage cover by vegetation type and overall canopy height within four fixed square meter plots.

# PROJECT BUDGET TEMPLATE

BUDGET ITEM	CRMC REQUEST	MATCH	MATCH PENDING OR SECURED? (select one)	SOURCE OF MATCH	TOTAL
Construction	\$40,000		Pending		\$40,000
Construction		\$50,000	Pending	TNC - cash	\$50,000
Monitoring		\$5,000	Pending	TNC -In-kind	\$5,000
TOTAL	\$40,000	\$55,000		TOTAL PROJECT COST	\$95,000



## **VI. 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.*

### **Construction**

Preliminary estimates for the cost of applying a nature-based practice to address coastal erosion at the northern site of the eroding bluff at Rosa Larisa Park is \$90,000. This is based on treating 100' including removing vegetation, installing toe protection rocks, cabled coir fiber rolls, and planting vegetation on the existing grade. It also includes the cost of mobilization of equipment and materials.

### **Monitoring**

Staff from TNC will conduct a five year monitoring program including visual inspections of both treatment and control areas and vegetation surveys.

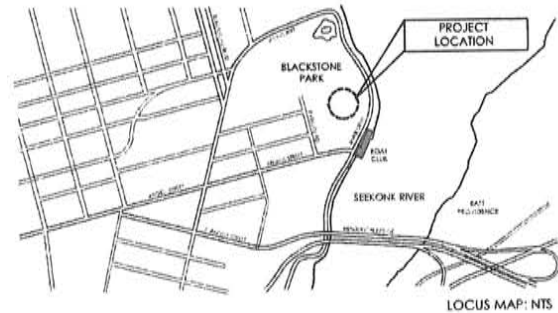
# Rhode Island Coastal and Estuary Habitat Restoration Fund Full Proposal Form 2019/2020

## I. PROJECT SUMMARY

1. **Project Title:** Coastal Upland Restoration in Blackstone Park Conservation District

2. **Project Location and coordinates (include map):**

Blackstone Park Conservation District  
Providence, RI,  
along the Seekonk River estuary  
GPS Coordinates 41.832697, -71.378679



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

4. **If other, please specify:** Remediation to stormwater-damaged slope and trail

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

6. **If other, please specify:** Coastal upland

7. **Restoration technique (e.g. re-vegetation, tidal restoration):** Site stabilization by re-vegetation, and stormwater control and redirection

8. **Total acreage or miles (river systems) of habitat to be restored, or project area planning unit size:** 450' of trail and adjacent areas varying in width from 12'-30'

9. **Project benefits:** Restore habitat, control erosion, stabilize slope, improve trail for park visitors.

10. **Project partners (organizations providing financial or other support to project):** Providence Parks Dept

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:

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## II. PROJECT MANAGER CONTACT INFORMATION

1. **Name:** Carrie Drake

2. **Organization:** Blackstone Parks Conservancy (BPC)

3. **Address:** PO Box 603141



4. City: Providence

5. State: RI

6. Zip: 02906

7. Phone: 401-383-8941 or 646-872-5490

8. Email: carrie401@gmail.com

9. Property Owner(s): City of Providence - Providence Parks Dept

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

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### III. BUDGET SUMMARY

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

Amount Requested from Trust Fund		\$57,975
Matching Funds	Project Partner(s)	Amount of Match
	Providence Parks Dept	\$4,330
	BPC	\$5,920
	TOTAL PROJECT COST	\$68,225

### IV. PROPOSAL NARRATIVE (five pages maximum)

#### 1. Justification and Purpose

*Describe the human impacts and previous restoration activities at the proposed project site. Briefly describe the proposed project, its restoration goals, long-term and short-term outcomes.*

Blackstone Park is a 45-acre semi-wild park in Providence that consists of wooded sandy-gravelly bluffs dropping to wetlands and the Seekonk River estuary. It is the second largest forest in Providence and an important part of a green corridor for migratory birds, resident bird species, and other wildlife.

The number of walkers and runners greatly increased following recent improvements to the trail system. One trail that was not restored is the "WPA trail", an old trail partly lined with masonry walls and entrance (see photos), constructed in 1935-7 by the Works Progress Administration. This trail runs between a popular grassy lawn and bluff-top, perpendicular to a steep grade. An attempt to close it was futile due to its high visibility, proximity to other popular trails, and historic features. Longtime and accelerating erosion and the emergence of a crossing trail midpoint have increased plant loss and worsened gulying of the trail.

The goal of the proposed project is to restore this eroded trail and adjacent forest by stabilizing the trail, adding plants, and protecting sensitive entrance points with fencing and signage. We will use methods that were successful in our earlier projects, in particular the CRMC-funded 2015 Boathouse Trail project (aka Edge Restoration, Phase II). We restored habitat and path on a degraded trail running roughly parallel to the WPA trail. A contractor installed 31 terraces of timbers backfilled with gravel with loam to the sides and



topped off with wood chips. These function both as steps and as planting beds for new shrubs. Most are perpendicular to the steep trail, although several were installed as angled waterbars to carry stormwater into the forest. Native shrubs were installed in the terraces, providing habitat and additional stormwater uptake while narrowing the walkable path. These terraces have functioned well (see photos), with simple maintenance: BPC volunteers regularly apply woodchips and restore shallow trenches at the waterbars. There was some early shrub dieoff during droughty conditions, but these were replaced by the contractor and further mortality has been negligible.

The proposed project includes many of the same approaches and BPC volunteer labor. Funded by a small DEM grant, we worked with landscape architects at Bradford Associates to prepare a draft plan for the site (attached). We will use landscape timbers to stabilize the trail and manage water flow. Adding appropriate shrubs and groundcover will increase habitat, reduce erosion and slow the volume and velocity of stormwater on the trail and adjacent areas. Stormwater will be re-directed off trail at the midpoint and above. One highly degraded section of the trail will be closed, and a less steep, previously closed upper section will be opened. Fencing and signage will guide park users and protect plantings.

Expected outcomes: Effective erosion control will allow regeneration of the forest and survival of existing trees and understory plants. Short-term, we expect to see erosion controlled on this slope, more stable footing for park users, and improved habitat. Longer term, this restoration will protect the fragile bluff from the intense storms that are a feature of the changing climate. Additionally, as sea levels rise in coming decades, the grassy lawn below the bottom of the trail may be subject to storm-tide flooding from the Seekonk River, and decreasing runoff to this area will help protect the estuarine habitat.

## **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. Indicate when annual and final project reports will be submitted.*

The trail naturally divides into four zones based on topography and degree of damage (see Plan). We will use the two-pronged approach of mechanical stabilization and planting that worked well on the Boathouse Trail. Native or near-native shrubs and groundcover will be used, particularly those that spread. Field conditions will determine the exact number and placement of timbers and plants. In some cases we can take an incremental approach that minimizes disturbance and is consistent with our previous projects, adding more or different features if needed. Activities described below are shown on the plan, except as indicated.

1. Lower trail, ~160' from stone entrance to the intersection with midpoint-path. The path runs uphill east to west, with a crossgrade from north to south. The lowest 100' is channel-like, bordered by a masonry wall. Here we will regrade, add crushed stone and gravel, and build timber step-ramps as shown. At the northern masonry wall's end, an old zig-zag timber fence, plants, and boulders will be used to reduce stormwater energy and keep people on-trail. Where the longer southern masonry wall ends, the trail will continue to be stabilized and raised with one or more timber step-runs, step-ramps or terraces, and gravel/stone. This section will be further evaluated in the field to maximize stormwater diversion and minimize damage to the trail edges. Groundcover will be installed along the north (upslope) side of the trail. Trail will be covered with wood chips.
2. Intersection, ~ 20' x 30': Grading, improving drainage, and timber waterbars will direct stormwater south of the intersection to the neighboring swale. Trail will be covered with wood chips. Site-appropriate shrubs will restore habitat and narrow trail (placement determined after construction).
3. North Spur, ~ 200' from intersection to bluff-top: Path will be closed using fencing, fallen tree-trunk sections, brush, and signage as shown. Coir logs (not shown) also will be used if funds allow.
4. Upper trail, ~65' from intersection to bluff-top path: Trail will be stabilized with a step-run and step-ramps (shown), and just above the intersection six 12'-14' wide terraces (not shown) with shrubs. Fencing and shrubs where this trail joins the existing bluff-top trail will define the entrance and prevent users from cutting through.



Timing: will depend on weather/soil conditions to avoid unnecessary damage.

Late June-July 2020: Contractors construct terraces and steps. Access to lower trail and intersection is from below. Access to upper trail is from above (a treeless staging area exists at the trail top).

After construction, Parks Dept delivers wood chips and logs. Contractors or volunteers install some check-dams and coir logs on North Spur, add chips to trails. Fences installed.

Sept-Oct 2020: Install some or all groundcover, shrubs. Water. Volunteers add check-dams and chips.

Spring 2021 - Install any remaining plantings. Annual report in March or as requested by CRMC.

Summer-Fall 2021 - Watering by contractor, as needed.

March 2022 - Final report, or when requested by CRMC.

Summer-Fall 2022 - Watering by contractor, as needed.

### **3. Minimization of Adverse Impacts**

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

This is a conservation district as designated and zoned by the City of Providence. Our mission is to preserve and steward it to the best of our ability. Before the project starts we will carefully evaluate field conditions to determine if less disruptive alternatives exist for our construction goals. A low-impact approach is both environmentally and economically sound for this and other spots in the park. As always, the project will be closely monitored and if a given technique does not adequately reduce the volume and velocity of stormwater, or if the park visitors' use of the space adversely impacts the project goals, we will implement more appropriate features as needed.

Heavy work will take place in summer, after the spring nesting season. Any damage from construction activities will be minimized by restricting heavy equipment to trails and prohibiting work on muddy days. To avoid disturbing soil more than necessary, we will bring in small plants and minimal soil or compost, instead using leaf litter from this park. There will be no outwash into the Seekonk River as a result of our work upslope. Silt fence and hay bales will be placed as needed.

### **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.*

We inform interested parties about our work in the Park through our website and a monthly column in the local publication *East Side Monthly*. As in past projects in the Park and Blackstone Blvd, we will post signs and conduct outreach with on-site volunteers before any work begins. Many park visitors have expressed appreciation to workers and volunteers in response to our earlier projects and to ongoing chip-spreading and other work, positive comments on Yelp and other sites support this. With the exception of some damage to the snow fences and temporary signs, the work to improve habitat and trails has been well received and not vandalized.

### **5. Economic and Educational Benefits**

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

The Park is less than one quarter mile from Wayland Square business district. Birders, walkers, and joggers who visit the park also shop and eat in Wayland square: improvements to the park are anticipated to increase economic activity there. Additional economic benefits include improved health and wellness through hiking or jogging and a stronger sense of community and civic pride that arises from connection to a cared-for park.

This project will provide direct educational benefits to the school and corporate groups who will work on the volunteer aspect of the project: we have found that a short introduction to our goals and challenges



followed by hands-on work, then reflection, provides a powerful learning experience. In the BPC's guided walks and family programs, and signage, this project provides an example of how erosion can be addressed in a challenging site. As in earlier projects, education efforts will be conducted in collaboration with the BPC's Education Committee and April Alix, coordinator of the USFWS Urban Wildlife Refuge Initiative, who has led teacher trainings and educational student events here.

## **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?*

This project is specifically aimed at increasing resilience of the site to stronger storms, higher temperatures, and varying rain/snow patterns. Stabilizing the slope with mechanical and biological methods will greatly improve the resistance to future stormwater damage. Plants added will be appropriate to site conditions and resilient to warmer temperatures and to emerging climate changes.

Stabilizing this slope will result in less outwash into field, which itself may be subject to flooding as sea levels rise in coming decades, as per CRMC STORMTOOLS models.

## **7. 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.*

Keeping this hillside forest healthy is consistent with the goal of protecting the state's water quality, as described in the RI Div. of Planning's 2016 management plan [Water Quality 2035](#). It is also in line with the State [Coastal and Estuarine Habitat Restoration Strategy](#) (2008) goals of protecting estuaries. The Seekonk River estuary receives fresh water from the Blackstone River and Ten Mile River. Along Blackstone Park it has an artificial shoreline made of rip-rap, a few feet of bare earth, then a paved road. Blackstone Park provides the buffer to runoff from the upslope homes and roads.

The project is consistent with State Comprehensive Outdoor Recreation Plan [Ocean State Outdoors](#) (2019) goals, in particular Goal 2: "Strengthen, expand and promote the statewide recreation network while protecting natural and cultural resources as well as adapting to a changing environment." Moreover, the programming and extensive trail network in Blackstone Park address a particular concern noted in the guide: that urban areas are often underserved in outdoor space and recreation opportunities, and that two of the top four outdoor activities in RI are walking, and attending outdoor festivals and special events.

This project is consistent with goals in the 1994 State Guide [A Greener Path - Greenspace and Greenways for RI's Future](#) promoting greener recreation and land conservation goals. Blackstone Park is the second largest forest in Providence and is part of the Blackstone/Seekonk River corridor. As such, it is an important open space for public recreation, leisure, and environmental education.

## **8. 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 or plants.*

No species of concern have been identified specifically in the project area itself (see 2012 Forest Management Plan, attached). However, several listed bird species have been documented in the park by Rick Enser and Dan Berard, including: blackburnian warbler, yellow breasted chat, northern parula, white throated sparrow, dark eyed junco, marsh wren, bald eagle. Improving habitat will support these species and the dozens more that live in or migrate through the Park.

## **9. Permitting**

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



We will work with CRMC to permit the activities in this project, which are similar to earlier CRMC-permitted activities in the park. Caitlin Chaffee approved this approach in conversation with Carrie Drake.

**10. 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.*

a) The BPC works with the Providence Parks Dept. to co-steward Blackstone Park and Blackstone Boulevard Park. We work together on innovative solutions to maintenance, on projects when possible, and they supply materials such as logs, wood-chips, fencing, and signage. Our Board of twelve advises on policy and finance, and is supported by three hard-working committees (Boulevard, Park, Education). Board members are consulted when needed: those with considerable relevant expertise include civil engineer Jon Ford, currently with Horsley-Witten Associates and designer of our 2014 trail restoration plan, and Colgate Searle, Professor of Landscape Architecture at RISD and head of a landscape architecture firm that specializes in planning and restoring environmentally sensitive lands. Our part-time business manager handles the books, prepares reports, etc. The BPC enjoys support from the Mayor's office and City Council members. BPC has approximately 350 supporters who donate money and/or time. Reliable assistance comes from local on-call volunteers, as well as corporate, religious, and school groups.

**b) Qualifications of key persons directly involved in project, all on BPC's Park Committee**

- 1.) Carrie Drake is Vice-President of the BPC, Park Committee Chair, board member since 2009. She runs BPC volunteer work days and has been active in Park projects since 2016. CRMC-Certified Invasive Manager since 2013, tree inventory and pruning volunteer with Providence Neighborhood Planting Program. PhD in Pharmacology, BA in Biology that included field ecology/botany courses. She was a faculty member in the Neurobiology Div. at Weill-Cornell Medical College for 10 years and a free-lance scientific editor. She has over 40 peer-reviewed publications and has experience reviewing and writing grants, including several for the BPC.
- 2.) Don Cordner has thirty-five years experience in project design, development, implementation and management, at Groden Network of Programs and Gordon School. He has a BA from Union College; MEd Rhode Island College. Active volunteer at Audubon Society of RI since early 1970s including Caratunk Wildlife Refuge trail design and maintenance in environmentally sensitive areas. Nature Conservancy Refuge monitor in Massachusetts overseeing responsible use of Sharp's Preserve. Lead manager of BPC's 2014 and 2015 trail and habitat restoration projects, former chair of trail subcommittee, active Park monitor. Planned and worked on Boulevard gardens.
- 3.) Martha Fraenkel worked in land use planning from 1987 - 2019. Particular interest and expertise in native and non-native plant horticulture. She has worked for federal state and municipal agencies as watershed analyst, environmental analyst, and land use planner. She holds a B.S. in Natural Resources Mgt. and and M.S. in plant science.
- 4.) Margaret Brookner - Board member and volunteer with BPC (and predecessor organizations) since 1995, working on trees, trail, and volunteer projects. Co-managed the 2014 Habitat -Trail project in Blackstone Park. Helped develop and manage the RI Tree Stewards Education Program for the Rhode Island Tree Council for 10 years. Longtime volunteer with Providence Neighborhood Planting Program, including tree inventories and street tree pruning as a Providence Community Tree Keeper.

**c) Successfully completed projects in habitat restoration and trail reconstruction**

*Habitat:* The Forest Health Works Project, 2011-12 was a collaboration between RI Natural History Survey, BPC and a volunteer team. Contractors removed a heavy infestation of invasive plants from 1.4 acres. Native plants and an attractive fence were installed, and the site was monitored closely for 5 years. The



installed plants are thriving, and “volunteer” tree seedlings and new understory species have appeared. This restored area serves both as habitat and as a demonstration site visible from a well-traveled sidewalk and road (see photos). At our request the Parks Department stopped mowing the adjacent slope along Parkside Avenue, an area subject to washouts. Grasses and forbs have re-covered this area, greatly reduced runoff and improved habitat (see photo).

*Habitat and Trails:* We have been working on trails and habitat in the center section for well over ten years in partnership with the Providence Parks Dept, supported by grants from DEM, DOT, and CRMC, and volunteers from Appalachian Mountain Club and BPC. Almost-monthly “Park-Keeping” work days support forest and trail health: typical activities include spreading wood chips on trails, restoring trenches at water bars, removing invasive plants. The Parks Dept supplies chips and logs.

Boathouse trail project, 2015. This CRMC-supported habitat and trail restoration has been successful as detailed above (Section IV.1) and in accompanying photos (Appendix).

Blackstone Park Trail Improvement, and Edge Restoration, Phase I, (2014-15) A large project funded by awards from CRMC, RI-DEM, and DOT restored habitat and trails. Shrubs, trees, and groundcover were planted and protected with temporary fencing. Trails were successfully restored using water bars, steps, lining with logs, and adding wood chips to increase porosity (see photos). The improved trails attracted many more park users, resulting in a continuing need for additional wood chips on the trails and additional erosion in some areas that required more water bars and steps.

Revegetation and Slope Stabilization (2017). A CRMC-funded small project. Plants and erosion control materials were installed on an eroding bluff edge and a steep bare slope next to 45 steps. The blufftop work was successful (see photo). On the steep slope our initial goals were met, most of the plants survived and the stone leak-offs stayed in place, but more remains to be done (see photos). In 2018 BPC bought and the Parks Dept installed a permanent metal railing along the stairs for safety and to better keep people and dogs off the restored slope. We plan to do more to nourish the still-poor soil, further stabilize the slope with additional plants, and continue to armor open spots with brush and limbs.

## **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.*

**Lifespan -** We expect the habitat and restored trail to last at least 15-20 years. The plants used will be long-lived and suited for the site. Some have been chosen for their ability to spread by suckering, and should increase in density to further stabilize the soil. The trail itself is designed with permanent mechanical stabilization - pressure treated timbers are rated to last 20 years. If maintained by volunteers, the terraces should last as long as the timbers. For comparison, the Boathouse trail has lasted 5 years with no apparent damage to the timbers and negligible damage to the terraces. The sandy gravelly soil tends not to puddle, so the trail is expected to dry out between rainfalls.

**Monitoring -** The BPC will be responsible for monitoring and maintaining the restoration. Monitoring will take place after major storm events and monthly for the first year, bi-monthly the second year, and quarterly in following years. As in other projects, we will also have informal monitoring by BPC members. We also will post signage requesting to be notified of issues, and expect that regular walkers will be in touch if issues



arise, as they do in other areas of the park. Results of monitoring will be discussed and plans made at monthly meetings of the Park Committee.

Maintenance - Volunteers will apply wood chips to terraces and restore the protrusion of water bars above grade. Work will be done once or twice per year, as needed. Chips will be provided by the city at no cost. This work is a good project for the school groups that we already work with regularly. New plants will be watered by a contractor for two growing seasons, more if drought conditions are present. The schedule will be bi-weekly or as needed depending on rainfall. The BPC already contracts with Groundwork RI to water on Blackstone Boulevard and other park projects, and they have committed to working on this project as well.

## **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 from other areas of the park is not likely to be an issue: the blufftop area directly upslope was addressed with plantings and erosion control in the 2014 project. Likewise, street runoff to this site is buffered by the upslope areas of the park.

Future sea level rise is a concern for the park in general. Models predict storm flooding of the riverside road and the part of the lawn area at the lower entrance to this trail. By stabilizing this slope we hope to prevent outwash and other issues from adding to any future flood damage. Similarly, the plants installed as part of this project are anticipated to make the site more resilient to warmer summers and more severe storms.

## **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).*

Performance measures include the following:

Stormwater will be redirected so as to reduce the volume and rate of flow in the degraded area.

Erosion will be significantly reduced or eliminated in the project area.

Downgradient sedimentation will be reduced or eliminated in the project area.

Foot traffic will be directed to locations that can absorb pedestrian impact without causing habitat deterioration.

The amount of exposed soil (bare ground) will be reduced so as to minimize erosion and sedimentation.

Bare ground in the project area will be revegetated with shrubs and forbs or armored with non-erodible cover material such as wood chips, crushed stone/gravel, etc.

### **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).*

We will monitor the area for successful/effective delivery of stormwater to the designated location, monitor the health of the plants, restore cover material where needed, ensure that designated paths are respected by users. Monitoring will be conducted monthly for the first year after the project is completed, bi-monthly the second year, and quarterly for the next 3 years. The first year we will also monitor the project following major storm events.

Trained BPC volunteers will monitor by visual assessment of the restored trail, plantings, and the closed trail spur. A short report will be emailed to the Park Committee of BPC, and discussed at meetings of the committee. The success or shortcomings of the project will be discussed at the BPC's annual meetings (typically in March). CRMC will be informed of the monitoring results in the required annual and final reports, and at additional times if requested.



## VII. PROJECT BUDGET TEMPLATE

BUDGET ITEM	CRMC REQUEST	MATCH	MATCH PENDING OR SECURED? (select one)	SOURCE OF MATCH	TOTAL
Shrubs: 20 #3, 10 #2, 30 #1 installed, guaranteed	\$2,970				
watering new plants for 2 growing seasons, 15@ \$200	\$3,000				
groundcover materials supplemental watering	-	\$2,500	secured	BPC	
regrade trail and install gravel/crushed stone, erosion control materials	\$14,475				
materials and labor for 35 terraces/waterbars & runs of timber stairs	\$35,130				
logs for check-dams and trail closing	-	?	secured	Providence Parks Dept	
wood chips (40 cu yd), delivered as needed	-	\$330	secured	Providence Parks Dept	
wood chip spreading and erosion control	-	\$1,500	secured	BPC volunteers	
fences (temporary or permanent)	-	\$1,000 or \$4,000	secured	Providence Parks Dept	
Plan/administer, prepare CRMC reports, process payments, coordinate signage	\$2,400	\$1,920	secured	BPC volunteers	
<b>TOTAL</b>	<b>\$57,975</b>	<b>\$7,250 or \$10,250</b>		<b>TOTAL PROJECT COST</b>	<b>\$68,225</b>

## 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.*

**Plants:** We estimate at least 60 shrubs will be needed (see plan). We will use a mix of species appropriate to these conditions, e.g. Aronia melanocarpa, Clethra alnifolia, Gaylussicia baccata, Viburnum acerifolium, Carex pennsylvanica. Groundwork RI estimated \$2,970 to purchase, install, and guarantee the shrubs. Additional groundcover for disturbed edges (not on plan) will be contributed by BPC.

Cost saving alternatives: 1. Plant fewer plants now, substituting temporary fencing and other measures to protect the site until funds are available. This would save about \$4000 (plants and watering). 2. Use smaller sizes (the current bid includes some larger sizes since the smaller ones are often unavailable) to save about \$1000. 3. Volunteers source, purchase and install plants. This requires skilled volunteers, would be challenging logistically, would take longer, lacks guarantee, and would save about \$2,000.

**Watering:** Contract with Groundwork RI for 2 years of watering all new plants from late June - October, averaging bi-weekly, as needed. Groundwork RI quoted us \$200 per watering. In very dry conditions the BPC will pay for supplemental watering (@ \$200 each).

**Construction:** Yardworks (contractor on previous trail projects) provided rough estimates based on draft plan and a site visit. The narrow site and steep grade resulted in higher labor estimates than expected.

Labor, materials and equipment (e.g. skid steer, mini-excavator) to clear trees from inside masonry channel lower trail, regrade lower trail and intersection, install gravel base and erosion control materials to divert stormwater. Estimate includes \$5,175 for 115 yd of ¾" crushed stone for the path and steps, for 250' trail (variable depth and width).

Provide and install 35 timber steps/terraces/waterbars, using pressure-treated 8"x 8" timbers 10'-14' long and re-bar fasteners, and two runs of steps, each 5 risers (1 @ 5' wide, 1 @ 10' wide).

Wood chips and logs will be provided and delivered by the Parks Dept. Volunteers (\$24.15/hr) will spread chips and construct some water bars and check-dams on closed trail, and add signage.

Parks Dept will provide fencing (temporary or permanent, depending on their funding).

Cost-saving options on construction: 1. Omit or delay some steps/terraces The six terraces proposed but not shown on the upper trail plan could be delayed until a later date. Currently this section does not show serious erosion, although those terraces will be needed as foot traffic increases. We may be able to omit 3 - 5 steps on the lower trail once final contour intervals are known. Projected savings: \$5,400 - \$8,100 (@\$900/step). 2. Phased erosion control: in 2020 BPC volunteers could construct all erosion control on the closed trail, using natural logs rather than timbers and straw-filled logs. Longer-lasting approaches will be needed to permanently control stormwater and deter walkers. Estimated savings: \$2500. 3. Quantity of crushed stone may be reduced if we construct fewer terraces, and/or use some cheaper processed gravel as in Boathouse trail terraces, saving about \$1000.

**Planning/administrative:** Business manager will work on administrative matters (reports, payments, signage, scheduling of contractors and volunteers): 20 hr @ \$32/hr. Landscape architect will measure contour intervals, prepare final plan and construction drawings, 20 hr @ \$80. Volunteers will contribute at least 80 hours @ \$24 to planning, meeting, scheduling, monitoring, reports.



## IX. ADDITIONAL MATERIALS

Please include the following with your application:

  X   Site and Locus Maps See cover pg and pg B-2 of draft plan by Bradford Associates in Appendix

  X   Ground-level photographs of existing site conditions See Appendix

       Aerial photographs, if available N/a

  X   Preliminary design drawings, maps or engineering plans, if available See draft plan in Appendix

  X   Pertinent physical, ecological, biological, and cultural / historical survey data  
See 4th pg ("Page 6") of 2012 Forest Health Management Plan, in Appendix. Electronic file was corrupted - please excuse the poor formatting.

  X   Letters of support From Wendy Nilsson, Superintendent of Parks, Providence Parks Dept (Appendix)

AUTHORIZED SIGNATURE

AUTHORIZED AGENT OF LEAD ORGANIZATION

*Carrie Drake*

January 23, 2020

Signature

Date

Return your completed proposal by 4:00 p.m. on **January 23, 2020** to:

**Caitlin Chaffee**  
**RI Coastal Resources Management Council**  
**Stedman Government Center**  
**4808 Tower Hill Road**  
**Wakefield, RI 02879**

[cchaffee@crmc.ri.gov](mailto:cchaffee@crmc.ri.gov)

Applicants are required to submit one (1) signed hard copy 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 **401-783-3370** with any questions.

