



VIRGINIA SALTWATER RECREATIONAL FISHING DEVELOPMENT FUND

SUMMARY PROJECT APPLICATION

Please complete all fields. This page should be used as a coversheet for a detailed application.

NAME AND ADDRESS OF APPLICANT:

Watermen's Museum
PO Box 519 / 309 Water Street
Yorktown VA 23690-0519

PROJECT LEADER (name, phone, email):

Michael Steen
757-887-2641
admin@watermens.org

DESCRIPTIVE TITLE OF EVENT:

York River Stewardship
Marine Habitat Enhancement Project

PROJECT LOCATION:

Watermen's Museum, Yorktown VA

BRIEF PROJECT SUMMARY: (include a detailed description of activity as an attachment)

The York River Stewardship Marine Habitat Enhancement Project will create a biogenic, "living" reef system at the Watermen's Museum pier located on the western side of the York River. The pier currently serves as a platform for educational programs supporting over 3000 student visits and over 100,000 visitors annually to Yorktown's Riverwalk. The Museum works closely with at-risk and special-needs students as community education partners. These ongoing programs include oyster aquaculture, crabbing techniques, and biodiversity analysis. The project will include the construction and installation of a biogenic, "living" reef system strategically placed under the pier to enhance the biodiversity of the benthic community and by attracting small food fish and large, predatory game-fish. Working with an industry partner, Ready Reef, Inc., submerged reef components will include oyster shell, concrete, and rebar, with reef height of 18 inches, each component weighing 250 lbs. The Museum will work closely with the project community education partners and Christopher Newport University to develop and monitor the reef system. The new habitat will allow the museum staff and interns to expand educational and daily programming to include student and recreational fishing, water quality analysis, hands-on biodiversity analysis, habitat development, climate change and sea level rise. The reef will also attract game fish to the pier allowing for increased recreational fishing from boats on the river as well as providing recreational and educational fishing opportunities from the pier. The project will include the installation of underwater cameras and fish finders connected to direct media feeds. This will allow the students and general public to directly observe the ecosystem of the marine reef and observe the development of the system over time. The reef system will provide an opportunity to increase knowledge and data of best practices for habitat restoration within a dynamic estuarine system.

EXPECTED BENEFITS: (Describe how your project directly benefits the average Virginia recreational angler)

The Museum's pier plays an important role in the ability for the Museum to educate adults and youth in the need for understanding and support of stewardship and ecology processes. The biogenic, "living" reef system will provide habitat for smaller marine life that will attract larger game fish. The project will provide: 1) Improved access for special-needs, adult and youth visitors to enjoy increased interaction with the marine habitat and increased opportunities for educational and recreational fishing, 2) Increased number and types of fish enhancing the experience for recreational fishing from boats on the York River, 3) Increased numbers and types of fish and shellfish, further enhancing educational opportunities and improving the health of the York River, 4) Allowing students and the general public to directly observe the development of the marine habitat and fish population using cameras, remote sensors, and monitors, and 5) Increased knowledge and data of best practices for habitat restoration which can be duplicated at other locations on the river to increase recreational fishing potential throughout the York River and Chesapeake Bay.

SUMMARY COSTS: (Please attach a detailed budget including all sources of recipient funding)

SUMMARY COSTS

Requested VMRC Funding:	\$37,000
Recipient Funding:	\$9,720
Total Costs:	\$ 46,720

The York River Stewardship Marine Habitat Enhancement Project

1.) Need

The York River Stewardship Marine Habitat Enhancement Project will provide a safe and protected access for special-needs students, educational groups, and the general public to interact with the marine habitat of the York River. The Museum pier is located along the western shore of the York River in Yorktown VA with exposure to severe northerly wind and wave action from a 25-mile run (fetch) of the river and a similar unimpeded weather situation from the south coming directly off the Chesapeake Bay. During recent major storms, pier use was prematurely suspended and the pier has been closed for program use to affect repairs. The project will protect and enhance public access to the Watermen's Museum pier by upgrading the electricity, water and safety rail system, access ramps, and floating piers. Improved services will allow the team to use cameras and remote sensing equipment to provide direct feed to monitors, allowing the special needs students and general public to observe the daily marine life and the development of the reef system. The improved pier will allow the Museum to offer expanded programs for recreational fishing and bio diversity analysis.

The project will enhance the Museum's reputation as an eco-heritage tourism and educational destination. It will allow the staff and community partners to directly engage the student and recreational angler community, eco-heritage tourists, and the general public creating an increased sense of Stewardship for the York River and Chesapeake Bay.

2.) Objectives

- A) Construct and install a biogenic, "living" reef system under the Watermen's Museum pier with additional support ("in-kind" services) from education and community partners, including adjacent US Navy and US Coast Guard bases, and Christopher Newport University.
- B) Monitor the effectiveness of the reef system to attract natural spat from oyster spawning
- C) Evaluate the biogenic reef community production (including resident reef fishes and shellfish) via systematic monitoring protocols and the extent of transient predatory fish attraction
- D) Improve pier utility, accessibility and safety features.
- E) Increase both formal and informal regional education program participation to include student and recreational fishing
- F) Install underwater camera and remote sensing technology to provide a direct media feed allowing for student and public observation of the reef habitat
- F) Conduct drop-in public education and recreational fishing programs

3.) Expected Results or Benefits

The project will provide:

- 1) Improved access for special-needs, adult and youth visitors to enjoy increased interaction with the marine habitat and increased opportunities for educational and recreational fishing

- 2) Increased number and types of fish enhancing the experience for recreational fishing from boats on the York River

- 3) Increased numbers and types of fish and shellfish, further enhancing educational opportunities and improving the health of the York River

- 4) Allowing students and the general public to directly observe the development of the marine habitat and fish population using cameras, remote sensors, and monitors

- 5) Increased knowledge and data of best practices for habitat restoration which can be duplicated at other locations on the river to increase recreational fishing potential throughout the York River and Chesapeake Bay

In addition, the Watermen's Museum plans to expand partnerships with Christopher Newport University, Virginia Institute of Marine Science, community education partners, area schools, and with other state, federal, and non-profit agencies for future projects geared toward long-term sustainability with the anticipation of increases in storm frequency and intensity, and challenges associated with rising sea level. The Museum views this as the first step forward in a comprehensive strategy to educate the public about with long-term benefits of physical protection and development/enhancement of high-quality fishing and associated influx of reliable annual marine harvesting and tourism revenues.

4.) **Approach**

The proposed reefs will occupy the entire water column with the upper portion of the reef remaining above the surface at high tide (MHW). The reefs will be placed on the existing substrate (hard sand) and extend to a height of 18 inches. The reef components will be placed underneath the pier superstructure.

Reef Specifications

- Physical contact to the substrate will be 3 sq ft per structure.
- Individual structures will be interlocked during placement forming a continuous breakwater reef.
- The reef components will be X pattern, 18 inches tall weighing 250 lbs each
- All reef structures will be steel-reinforced concrete and include wire mesh. Shells will be embedded into the surface to promote accretion and biodiversity.

-Over time, the biogenic reef will continue to exfoliate (grow and break off) providing further wave protection to the pier and biological services to the reef and adjacent benthic communities.

Reef Component Construction

The project staff working with representatives from Ready Reef, Inc. will construct 10 X patterns. The team will work with community volunteers, school students, and college students from Christopher Newport University to create the concrete, rebar and shell reef blocks for use in the project.

Installation

The project team will transport the reef components from the casting area and place them in position under the pier from a barge.

Monitoring

Monitoring of the project will be managed by faculty from Christopher Newport University and conducted by CNU college interns for two years to more completely inform the state and public about the performance of this innovative project. Project monitoring will include assessment of:

the development/production of the biogenic reef community (including resident reef fishes)

-accretion of biogenic and non-biogenic filter feeders,

the extent of transient predatory fish attraction

-recreational angler surveys.

Pier Accessibility Improvement

The Pier at the Museum was damaged by storms in 2015. Utility, safety and accessibility features will be upgraded to meet current requirements making the facility better for all of the visitors.

Install improved special needs specific hand rails: \$3,000 materials, \$1,000 labor (\$20 x 50hr)

Install improved accessible floating docks: \$4,000 materials, \$2,000 labor (\$20 x 100hr)

Install improved special needs access ramps: \$5,500 materials, \$3,000 labor (\$20 x 150hr)

Upgrade and install electric and water systems \$1,000 materials, \$1,000 labor (\$20 x 50hrs)

Programming

The Museum staff will develop and present cross-curricular programming focusing on educational and recreational fishing, habitat restoration, sustainable aquaculture, and watermen's cultural heritage, as well as climate change and sea level rise. Seasonal staff will be hired to provide exceptional hands-on eco-heritage programming, recreational fishing opportunities, and drop-in programs for special needs students, adults and the general public. Educational signage will be developed and displayed to educate passing visitors on recreational fishing and living reef systems. Staff will provide cross-curricular

hands-on programs to include recreational fishing, biodiversity analysis, water quality analysis, hands-on science, hands-on cultural crafts, and hands-on art.

5.) Location

The Watermen's Museum pier is located on the western shore of the York River in Yorktown Virginia. The reef restoration project will be located directly under the pier superstructure.

6.) Estimated Cost and Justification

Budget Category	Materials	Labor	Grant	Match	Total
Produce Molds					
Reef Molds	\$620 (\$310 x 2)	\$300 (\$15x 10hr x2)		\$920	\$920
Reef Casting					
Concrete, rebar, shell	\$2,500 (\$250 x 10)		\$2,500		\$2,500
Installation					
Reef install Ready Reef tech		\$1,000 (\$100per x 10)			
Barge	\$500		\$500		\$500
Barge Labor		\$800 (\$20 x 4 x 10)		\$800	\$800
Monitoring					
Supervision		\$9,000 (\$50 x 180hr)	\$9,000		
Intern Field Work		\$6,000 (\$20 x 300hr)	\$6,000		
Supplies	\$2,000		\$2,000		\$2,000
Pier Improvement					
Improved Handrails	\$2,000	\$2,000 (\$20 x 100hr)	\$2,000	\$2,000	\$4,000
Floating Dock repair	\$2,000	\$2,000 (\$20 x 100hr)	\$2,000	\$2,000	\$6,000
Accessible Ramp(s)	\$3,000	\$2,000 (\$20 x 100hr)	\$3,000	\$2,000	\$5,000
Utility upgrade	\$1,000	\$1,000 (\$20 x 50hr)	\$1,000	\$1,000	\$2,000
Programming					
Increased Ed Staff		\$9,000 (\$10 x 30hr x 15wks x 2)	\$9,000		\$9,000
Ed exhibits/signs	\$2,000	\$1,000 (\$20 x 50hr)	\$2,000	\$1,000	\$3,000
Educational Supplies	\$3,000		\$3,000		\$3,000
Media components	\$4,000		\$4,000		\$4,000
			\$37,000	\$9,720	\$46,720

*This form alone does not constitute a complete application, see application instructions or contact Alicia Nelson at 757-247-8155 or alicia.nelson@mrc.virginia.gov



December 14, 2015

To Whom It May Concern,

I am writing to you today regarding the December 2015 Watermen's Museum application to the Virginia Saltwater Recreational Fishing Development Fund. In support of the proposed project, I will be serving as the coordinator for Christopher Newport University (CNU) undergraduate interns set to participate in the York River Stewardship Marine Habitat Enhancement Project. In my five years at CNU, I have worked as an undergraduate research coordinator and have extensive experience overseeing both living shoreline and other aquatic reef projects/programs. Alongside staff from the Watermen's Museum, I will train and monitor the performance of undergraduate interns to assist with the formal monitoring of the proposed reef structures as well as their engagement with the public, as public engagement with science is viewed as an important element of this program.

My submission of this letter is to confirm my support for, and role within, the proposed project. If you require any further clarification of my participation in this project, please do not hesitate to contact me. Thank you for your time and consideration of the proposed project application.

Sincerely,

A handwritten signature in cursive script that reads "Russell Burke".

Russell P. Burke, Ph.D.

Christopher Newport University

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