Blue Technology: Acquiring Collec'Thor Marina Cleaning Device

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Writing Sample

Proposal Summary: [redacted] has partnered with [redacted] to acquire and donate or lend out their line of blue technology. Blue technologies are marine debris intervention devices that will help remove waste from our oceans, beaches, and waterways. These innovative devices and systems are designed to monitor and clean our oceans without harming marine ecosystems. One of these devices, the Collec'Thor, is a trash skimmer that filters through ocean water or freshwater to collect plastic, cigarette butts, bottle caps, fishing lines, and other marine debris. [redacted] seeks to donate the Collec'Thor to the Cape Ann Marina to clear the ocean of marine debris and educate the community about sustainability and ocean life. Employees of the marina will empty the Collec'Thor daily and log the kinds of litter that were caught by the device into a marine debris logging app. Once a month, the marina will host an educational event for students and community members to empty the contents of the Collec'Thor together and sort them. The goal is to bring awareness to the kinds of trash that make their way into the ocean and help the community brainstorm ways to combat it. Through education and awareness, [redacted] hopes to create a longer-lasting impact in reducing marine debris and pollution in the coastal environment.

Mission Statement

[redacted]'s mission is to preserve and protect the world's oceans, seas, wetlands, and estuaries by motivating citizens to evaluate the critical issues facing the water environment, educating the public on best practices for sustainability, and providing guidance for taking effective action.

Organization annual operating budget: $134,805

How many people does your organization serve or impact annually?

Based in Gloucester, MA, [redacted] serves communities on the North Shore of Massachusetts from Cape Ann to the greater Boston area and New Hampshire. Our local conservation, education, and STEM programs benefit roughly 700,000 people in our geographic region. Due to the pandemic, our in-person program was postponed from 2020-2022, but projects such as eelgrass monitoring will be resumed for 2023, with positive impacts for residents of the communities of Gloucester, Rockport and Manchester-by-the-Sea. [redacted] also has other projects and programs that reach far beyond the local community, making it difficult to estimate how many people are impacted through all of our initiatives.

[redacted] has developed a successful internship program that has hosted over 1,200 interns, been accredited at over 1,350 colleges and universities, and provided more than 75,000 volunteer hours annually. We have about 135 interns (with 5-month terms) and 30-40 advisors (with year-long terms) at all times, amounting to around 350 volunteers per year committing 15 or more hours per week to the organization. These individuals learn job-specific skills depending on the department they have chosen to work in, which will be a benefit to them and those they serve going forward; [redacted]'s departments include Marine Science & Technology, Advocacy Initiatives & Legislation, Green Scholars, Sustainability Consulting, Climate Action, Environmental Justice, Business Operations, Marketing, Grant Writing, Human Resources, and Web & Tech.

[redacted] has also had tremendous success with implementing its Green Scholars Program–over 100 schools and upwards of 600 teachers have implemented this comprehensive curriculum guide in their classrooms. The Green Scholars program is a project-based, honors-level middle and high school program encompassing four domains: environmental literacy, professional skills, and project and program management. Ultimately, Green Scholars seeks to inspire and enable students to create change in their communities while building a foundation of knowledge that will enable them to do so. Several schools implementing the Green Scholars Program have won the U.S. Department of Education Green Ribbon Schools Award, the highest honor for an educational facility to achieve (U.S. Department of Education, 2021).

Program Summary

[redacted] has partnered with [redacted], a Quebec-based technology company that manufactures a line of ocean-cleaning devices called Searial Cleaners. We hope to acquire them with grant funding and donate or lend them out to various marinas, yacht clubs, or ocean nonprofits. One of these devices is the Collec'Thor: a trash skimmer that filters through ocean water or freshwater to collect plastic, cigarette butts, bottle caps, fishing lines, and other marine debris. The Collec'Thor filters through 8500 gallons of water per hour with its low-energy 750-watt pump; any plastic larger than 4mm will be caught by

the filtration screen. The Collec'Thor will also filter out hydrocarbons (which make up crude oil and other fossil fuels) from the water. The device can hold up to 110 liters (29gal) of trash, and the frequency with which it needs to be emptied depends on how much debris is in the water. There is no catch bag, to prevent needles and other sharp objects from poking through and breaking it; the trash must be removed carefully from the bin and sorted by using a crank that will raise the bin to hip height to be emptied.

In donating this device to local Cape Ann Marina, we seek to use the Collec'Thor as a way to clear the ocean of marine debris as well as educate the community about sustainability and ocean life. Employees of the marina would empty the Collec'Thor at the same time daily and log the kinds of litter that were caught by the device into a marine debris logging app. Once a month, the marina would host an educational event for students and community members to empty the contents of the Collec'Thor together and sort them. Hosting this program would bring awareness to the kinds of trash that makes its way into the ocean and help bright community minds brainstorm how to combat it.

While marine debris skimmers are helpful and essential tools, the real solution to the marine debris problem comes from education and awareness, which leads to changes that limit marine debris from entering our waters in the first place. The information from the data collection can disseminate the knowledge to the local communities and educate them about the impacts that marine debris has on the coastal environment and their surroundings. It is our hope that the organizations we partner with for these devices will spearhead the efforts or collaborate with us to create educational programming around the pollution and debris found in the Collec'Thor. Educating the next generation of environmentally-conscious citizens through outreach in underserved communities will create a longer lasting impact than the marine debris skimmers can on their own. Through hands-on experiences, participants will be more aware of the impacts their daily actions can have on the environment, learn how to reduce their own waste alongside the help of the marine debris skimmer, and even allow them to educate others on the urgency of these environmental initiatives.

Amount Requested: $19,340

What problem or need does the proposed request address?

According to the World Wildlife Foundation, approximately 12 million tons of plastic end up in the ocean every year. In fact, cigarette butts are the most prominent form of litter found in the oceans (Smith & Novotny, 2011). Since the cellulose acetate that composes cigarettes is not biodegradable, those toxins will stay in the ocean indefinitely. According to a San Diego University Study described by Slaughter (2020) and the National Oceanic and Atmospheric Administration (2021), a single smoked cigarette butt can contaminate a liter of water with carcinogenic chemicals. Species like the Atlantic Sturgeon are endangered in Massachusetts partly because ingested marine debris causes them to perish. People come to Boston and the surrounding areas to eat the oysters, lobster rolls, and New England clam chowder that northeastern Massachusetts is famous for. The Woods Hole Oceanographic Institution (WHOI) (2021) stated that in 2016, the fishing and seafood sector housed 87,000 jobs and generated $7.7 billion of revenue in MA. However, waste that threatens wildlife also threatens the revenue generated by tourism.

In order to keep the industry healthy, we must keep the ecosystem healthy. Fishing gear makes up 10% of that: almost one million tons of plastic per year is due to improper disposal of derelict fishing equipment (Nicolas, 2020). Fishing lines, most notably, can ensnare fish and other species, often harming them fatally in the process. Sea Shepherd reports that 70% of marine animal ensnarements are due to "ghost nets," or the remnants of old lines or nets tossed into the water ("The Most Dangerous Single Source," 2019). The commonly used shrink wrap on fishing gear and discarded plastics linger in the ocean, harming the local species for hundreds of years. Ultimately, marine debris harms oceanic life and takes away the cultural value from these landscapes.

Nicolas, A. (2020, October 20). *Ghost fishing gear.* World Wildlife Fund. https://www.worldwildlife.org/stories/ghost-fishing-gear

Slaughter, E. D. (2010). *Toxicity of cigarette butts and their chemical components to the marine and freshwater fishes, Atherinops affinis and Pimephales Promelas* (dissertation). San Diego State University, San Diego, CA.

National Oceanic and Atmospheric Administration (2021, February 26). *What is the most common form of ocean litter?* National Ocean Service. Retrieved October 19, 2022, from https://oceanservice.noaa.gov/facts/most-common-ocean-litter.html

Smith, E. A., & Novotny, T. E. (2011). Whose butt is it? Tobacco industry research about smokers and cigarette butt waste. *Tobacco Control*, *20*(1), i2–i9. https://doi.org/10.1136/tc.2010.040105

Wills, L. (2019). *The most dangerous single source of ocean plastic no one wants to talk about*. Sea Shepherd Global. https://www.seashepherdglobal.org/latest-news/marine-debris-plastic-fishing-gear/.

Woods Hole Oceanographic Institution. (2021, February 9). *WHOI working to address ocean acidification; protect region's vital shellfish industry.* Retrieved June 16, 2022, from https://www.whoi.edu/news-insights/content/massachusetts-ocean-acidification-shellfishing/

Target Populations

Ocean pollution is a major global problem, is growing, and directly affects human health. We are all at risk, but the people most seriously affected are people in coastal fishing communities. Marine pollution can affect entire communities — changing their social behavior, altering the local economy, and threatening their natural and cultural resources. With this project, [redacted] is primarily targeting communities that rely on marinas for their survival to implement the marina cleaning devices in.

[redacted] seeks to impact the entire North Shore of Massachusetts through the use of these marina cleaning devices; the Collec'Thor device this specific funding request is being submitted for targets the residents of Gloucester, Massachusetts. Gloucester is one of the oldest fishing seaports in the U.S. and remains one of the nation's most active fishing ports today. Every community member of all ages, education levels, genders, ethnicities, and income levels will be impacted and all are welcome to participate in the marine debris data collection and monthly educational presentations to aid in the preservation and protection of the oceans, seas, wetlands, and estuaries.

Approximately 30,000 individuals will be impacted (the population of Gloucester, MA on Cape Ann, where this Collec'Thor will be installed).

Gloucester, MA demographic info here:
https://www.census.gov/quickfacts/fact/table/gloucestercitymassachusetts/PST045221

Program Operating Budget

Name	Price
Collec'Thor Device	$16,000
Agency Commission (paid to Poralu Marine)	$1,600
Educational Side Displays	$1,740
Total	**$19,340**

What will be accomplished through this program?

Through this program, we hope to provide a better habitat for marine life in North Shore, MA, a cleaner environment for residents and tourists of the area, and a more engaged community in sustainability issues. While it may be difficult to track the quality or population of wild caught fish, it is easily possible to track the amount of marine debris taken out of the ocean by the Collec'Thor. Tracking the weight of the catch every day is an easily-implemented key performance indicator. Of course, success in this way would not be seeing the numbers continually rise, but rather for them to lower.

[redacted] wants to run itself out of business–it would be a much more sustainable world if there weren't enough trash in the oceans to warrant a need for trash skimmers. Seeing initially high numbers that decrease over time would signal that residents are becoming more aware and attentive to the trash in the local bodies of water. Additionally, seeing the number of community members rise at monthly [redacted] events would also be a measure of success, since it would demonstrate the locals becoming more involved in environmental issues. [redacted] would continue to assist the marina in contacting schools and local businesses to engage them at these monthly programs.

Project Outcomes

Marina staff members will clean out the device on a regular basis and will log the debris into the Marine Debris Tracker app to be used by researchers at the University of Georgia. Once a month, [redacted]/marina members will conduct educational presentations on marina health, highlighting the trash that the Collec'Thor collected.

Project Outcomes:	*Measured by:*
Community engagement this sustainability issues	→ Number of people at monthly programs
Marine debris removed from ocean	→ Amount of trash in Collec'Thor (in kg)
Marine debris removed from ocean	→ Subjective visual perception of clearer water