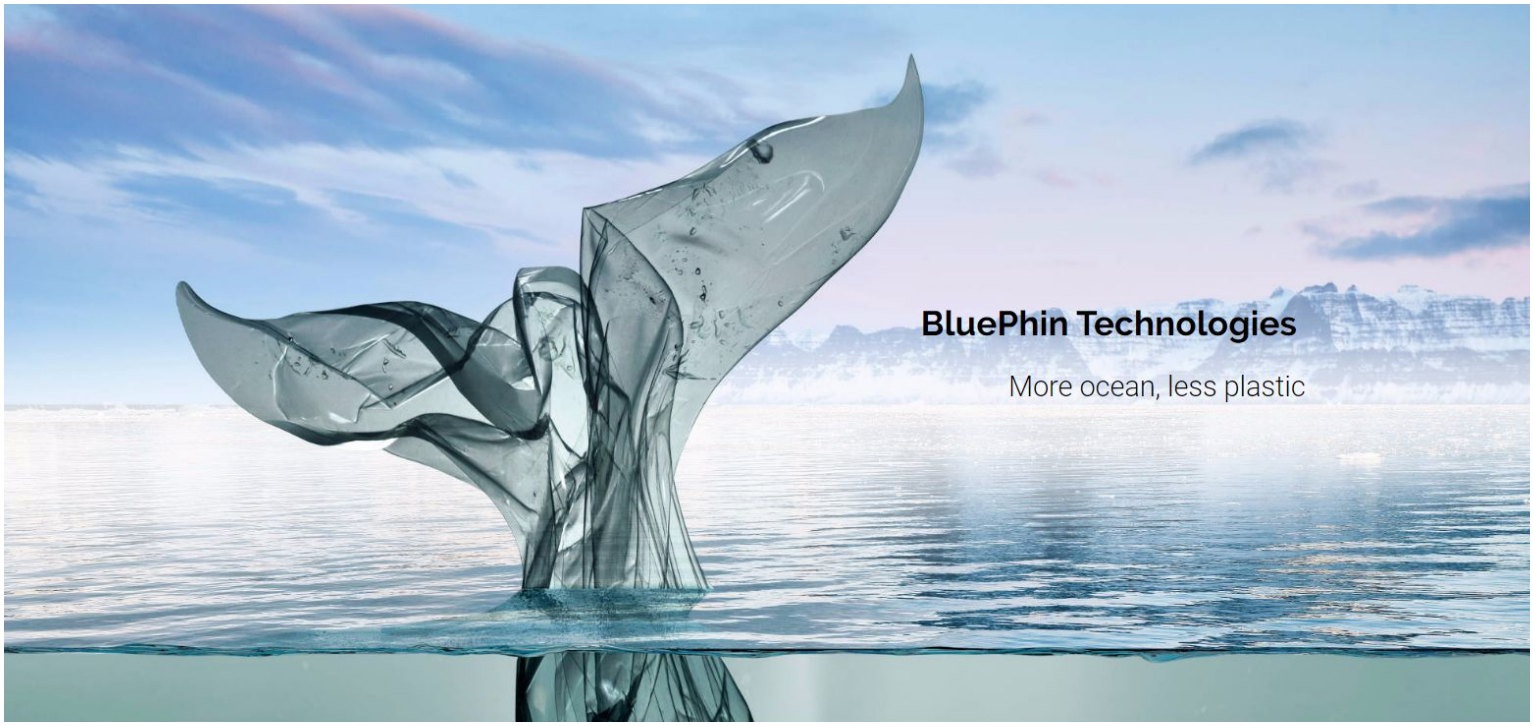
Seaside Sustainability, Inc.

BluePhin BlueTec Pilot & Research



Executive Summary:

Marine debris and pollution of the marine environment is a global epidemic that affects the environment and all living things. The greatest marine debris issue stems from plastic pollution and the underdeveloped recycling system that exists in the U.S. and around the world. According to National Geographic, some 8 billion pounds of plastic waste flows into the oceans each year from coastal regions. Plastic production has increased tremendously over the past few decades, and plastic pollution in our oceans has continued to interfere with the lives and livelihood of marine animals, as well as the environment itself. Most plastics are not biodegradable, but instead break down into smaller pieces that are eventually ingested by marine life. Once these plastics break down, they also become harder to remove from the ecosystem.

There are several organizations around the world that are trying to help mitigate this problem through technology and techniques. The BluePhin, owned and operated by BluePhin Technologies, is a great example. BluePhin is a smart robot developed for collecting floating waste and monitoring water quality across inland and commercial water bodies. Seaside Sustainability ("Seaside") is planning to purchase one of these devices and operate it in the local harbors and waterways of the North Shore of Massachusetts. Seaside is a 501(c)3 nonprofit organization that is regionally located and nationally recognized as a leader in environmental and STEM education programs and initiatives.

The coastal communities of Massachusetts are the ideal environments for the BluePhin. Seaside Sustainability, along with many other organizations, are key in the fight to clean our oceans and prevent plastics and marine debris from entering. The BluePhin is one avenue that makes this possible. With a proven track record of safety and performance, BluePhin is the optimal solution for waterway clean up operations. BluePhin has a proven track record of satisfaction with a variety of clients, from governments to non-profit organizations. Seaside's goal is to get as many people as possible involved and educate the community on this important issue by partnering with local cities, towns, Rotary Clubs and other community service groups to pilot this research.

Funding secured through grants will allow for the purchase and operation of the BluePhin, which will be owned, insured, and managed by Seaside Sustainability. This BluePhin pilot research provides research and findings related to the BluePhin and its possible impact on the community if purchased.

Introduction:

Global estimates suggest a growing percentage of waste ends up in the ocean. Plastic production has increased astronomically since the 1960s and continues to rise while plastic pollution in our oceans has continued to interfere with the livelihood of marine animals and the marine environment. Currently, only a small percentage of the world's plastic is recycled, and the rest ends up in landfills, in our environment, or burned for energy, releasing harmful chemicals into our atmosphere and the air we breathe. Most plastics are not biodegradable, but, due to intense exposure to sunlight, salt, and wave action, break down into smaller and smaller pieces, never truly "degrading". These microplastics represent a serious threat to all marine life and can even travel through the trophic system until they reach our dinner plates.

The BluePhin is an innovative waste collecting robot that is capable of collecting and removing floating materials such as trash, plastic, microplastics, vegetation, and marine debris from the surface while simultaneously collecting environmental data. This technology would be deployed for a pilot project testing and research in local harbors and other local waterways along the North Shore of Massachusetts, starting in Gloucester Harbor.

The BluePhin has three main operation functions: marine debris, water quality testing, and water quality testing. Once deployed, the BluePhin will collect floating marine debris from the water to keep the harbor clean and prevent the plastic from sinking or moving further into the ocean. By removing debris when it is still in the harbor, the harmful effects of plastic pollution on the marine ecology of the area can be prevented. This technology is very effective for marinas, harbors, and ongoing educational outreach. Additionally, the BluePhin will perform multi-mission water quality sensing, collecting important data on the water's longitudinal health and quality such as pH, depth, conductivity, temperature, dissolved oxygen, turbidity, salinity, sodium, chloride, magnesium, sulfate and calcium.

Sponsors & Donors:

Seaside is accepting donations for those that wish to support this effort both locally and nationally. Corporate sponsors can develop a marketing campaign around the operation of the drone including:

1. Physical presence on drone;
2. Logo on BluePhin fundraising page;

3. Inclusion in all communications/media outreach/ promotion;
4. Support in messaging why this is important and how it fits in with the sponsor's mission
5. Participatory opportunity at launch;
6. Seaside can agree to participate in the organization's marketing/communications and endorsement.

The BluePhin by BluePhin Technologies

(Figure 1, The Latest and Most Advanced Environmental Technology at your Disposal - Source: BluePhin Technology)

There are currently two BluePhin models produced by BluePhin Technologies, manual and autonomous models. The manual model must be operated manually using joysticks, while the autonomous that is able to guide itself through the waterway on a predetermined path. Seaside has had extensive communication with BluePhin Technologies to obtain a better understanding of how the device works, the various challenges that must be addressed (contained in this document) and the benefits the BluePhin has for the environment and our community. The BluePhin that would be purchased and managed by Seaside is the autonomous model. It comes with a number of features the manual model lacks, including:

   a. create a virtual perimeter for a real-world geographic area with the assistance of way point mapping technology.
   b. can be run around a set course or around a set perimeter (geofencing).

2. Has 8 hours of endurance;
3. It is autonomous so it guides itself onto a platform and gets winched up and out of the water (Seaside will have access to a boat locally to assist in case of emergencies);
4. Can manually steer with a joystick if needed;

5. Collision avoidance technology;
6. The software can run on PC and tablet. Users can create a virtual perimeter for a real-world geographic area with the assistance of way point mapping technology;
7. Camera that can transfer a live feed onto a laptop or phone, providing an exciting educational tool that could be used in the classroom. Although continuous monitoring will be essential to managing this device;
8. Runs on rechargeable batteries;
9. Emissions Output: Zero Carbon Emission;
10. Collects debris as deep as 1' below the water surface;
11. On-board equipment & sensors: camera & lidar (will install a lamp and bell)
12. Optional water-quality sensors: pH, depth, conductivity, temperature, dissolved oxygen, turbidity, salinity, sodium, chloride, magnesium, sulfate and calcium.

Safety Record and Permitting:

The features and functions of the BluePhin provide various benefits and safety measures for the operator as well as those that may come in contact with it, making it a reliably safe device for both humans and animals alike. BluePhin Technologies reports zero accidents to humans anywhere in the world. Because the BluePhin is equipped with collision avoidance, it is unlikely that it would damage any property in its vicinity. The unit is a visible white color and will be affixed with a rotating hazard light, making it simple to locate in the waterways. Regarding animals, particularly fish, the BluePhin has received no animal injury complaints since the device began entering aquatic environments. The device has been specifically designed to avoid this possibility by suction, vacuum, shredding, or compacting features within the device.

The permitting process for the BluePhin is ongoing. Currently in the US there are limited regulations on surface and underwater drones, although regulations for all drones especially Unmanned Surface Vehicle (UAV's) are more stringent in and around major coastal cities due to security. Seaside staff has consulted the following local, regional and national groups all strategically located in Beverly and Gloucester. The operation of the BluePhin will be limited to coastal areas within a mile of the coastline, rivers, and ponds. If used in the open ocean, then there could be more regulations and we do not plan on this operation in the future.

- **The National Oceanic and Atmospheric Administration (NOAA):** There are no regulations or maritime laws regulating the use of a surface aqua-drone with the specifications, proposed operation and location of the BluePhin. Operation outside the proposed area may be subject to some Endangered Species Act review under NOAA authority for marine animals.

- **United States Coast Guard:** No issues in operating the BluePhin in Gloucester or Beverly Harbor, just treat it like any other vessel; get the right day shape up and use proper navigation lights during night time and reduced visibility operation; outfitting with a collision avoidance horn may be wise. Avoid obstructing channels for vessel traffic and make sure its well-marked and managed.
- **Massachusetts Environmental Police:** There are no regulations or maritime laws regulating the use of a surface aqua-drone with the specifications, proposed operation and location of the BluePhin.
- **Massachusetts Division of Marine Fisheries:** There are no regulations or maritime laws regulating the use of a surface aqua-drone with the specifications, proposed operation and location of the BluePhin.
- **Gloucester Department of Public Works:** No conflicts; they are interested in the debris it collects and the process of disposal.
- **Gloucester Harbormaster and Office of the Mayor:** Complete support the technology and are interested in adding BlueTec to the city.

BluePhin Awards:

BluePhin Technologies has been gaining recognition through many competitions around the world. BluePhin won first place at the Pitch Competition at Sharjah Entrepreneurship Festival, winning 100k. The company also holds the Unilever's Young Entrepreneurs Award showcasing their innovation.

(Figure 2 - BluePhin Technologies)

	BODY	WASTE BASKET
LENGTH	1.78 M	1.4 M
WIDTH	1.10 M	0.80 M
HEIGHT	0.70 M	0.30 M
DRAFT	0.15 M	
CAPACITY		336 KG
SPEED		5 KTS
ENDURANCE		8 HOURS

(Figure 3 - BluePhin Dimensions)

Management & Operation of the BluePhin:

Seaside Sustainability will handle all management, operations and logistics of the BluePhin. Seaside Sustainability will take additional safety measures when operating the unit; although the autonomous and has the ability to follow a pre-programmed path up to 5 km without an operator, Seaside will always have an operator on site that is either manually steering with a joystick or is watching the BluePhin's movement through the live-feed camera. Seaside will also only be operating during daylight hours and will remain out of the waterway channels where it would interfere with navigation. Seaside Sustainability will add an Inland Marine Policy schedule which will be added to an existing general liability policy so the operation of the BluePhin will be fully insured. Seaside will ensure contact with local legislators and harbormasters to make sure that the BluePhin is fully eligible and accessible to be in the harbor. These precautions will provide an additional layer of safety for the BluePhinas it navigates the local harbors of the North Shore of Massachusetts and ensures that enhanced safety measures are taken for the pilot research.

The BluePhin is built to run for eight hours a day, depending on the water conditions, the amount of debris collected, and temperatures (cold temperatures can reduce efficiency by half). Once the waste collection bin has reached its capacity, the BluePhin will return to a collection point where the operator is able to remove it and separate it into four streams: trash, compostables, plastics, and other recyclables.

- **Trash:** Will be transported to the containers on site, such as the on-site dumpster or to an offsite disposal location
- **Compostables:** Black Earth Compost will pick up the organics
- **Plastics:** Seaside is currently working on establishing a partnership with a local company that collects plastics to create new products from ocean marine debris plastics
- **Other Recyclables:** Will be transported to the containers on site, such as the on-site dumpster if permitted or brought to Seaside's office

Does Marine Debris Affect Us Locally?

In order to see if and how Marine Debris directly affects local communities, the staff at Seaside has evaluated (by observational methodology) the harbors of Beverly and Gloucester, MA to assess the extent of the marine debris issue. They found that not only was there a significant amount of floating marine debris, but debris was located against the walls, rocks, and pillars, and along the visible seabed. It was also determined the vast majority of what we consider marine debris is mostly comprised of plastics ranging from fishing gear, single-use water bottles, cups, lids, rope, plastic sheeting, and everything in between. After evaluating the three communities, we have come to the following conclusions based solely on Seaside's observational methodology (evaluating the harbor coastlines from the shore to 20 feet offshore - the sizes of the pieces range from very small to large):

- Floating debris covers about 1% of the water surface
- Debris that has washed ashore is also about 2% of the area
- Sunken debris varies widely from 5-10% of the sea floor in Beverly and Salem and up to 70% in Gloucester

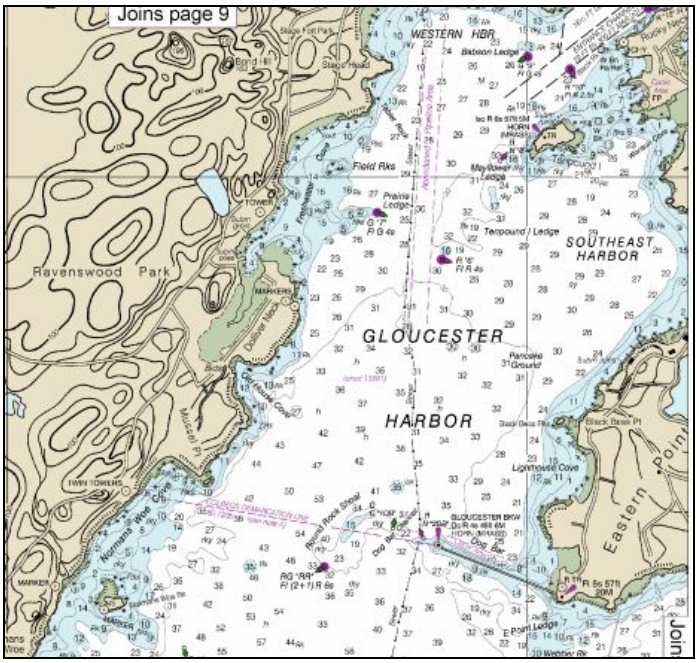
It is important to note that individuals and cities/towns are able to help mitigate this problem by preventing the waste from ending up in our waterways in the first place. Waste ends up in our waterways, such as harbors, rivers, canals, etc. that eventually lead to the ocean in a variety of ways. Marine debris enters the ocean from many different avenues, some of the paths are policy driven

and some are human behaviors. Until we find alternatives to single-use plastics in particular on a wide scale, we will continue to have a significant issue in this area. These means are especially prevalent in our coastal communities:

- Waste in the streets is more prevalent after residential recycling and trash day;
- City/town-wide recycling and trash systems with completely uncovered bins that allow debris to be blown into the waterways and the streets;
- Marine debris is more prevalent after heavy rains;
- Plastic production / packaging;
- Unfiltered storm drains that lead directly to the ocean;
- Seasonal wind;
- Overflowing public trash receptacles;
- Undefined system of constant trash removal from the streets;
- Intermittent street sweeping;
- Oceanside parks;
- Oceanside birds attracted to trash and transporting it to water;
- Heightened levels of tourism.

Location of the BluePhin Operation:

With all of the environmental problems especially prevalent in coastal communities, Seaside Sustainability has decided to pilot the operation of the BluePhin at the Beverly and Gloucester Harbor. The BluePhin will only travel 20 feet away from the shoreline at all times. To the right is a map of the harbor and below, the predetermined path that the BluePhin will take.



(Figure 4 - NOAA Map of Gloucester Harbor)

(Figure 5 - Aerial view Gloucester Harbor demonstrating BluePhin path in autonomous mode)

The BluePhin as an Educational Tool:

Since this program is both educational and environmental, the pilot research will also include an emphasis on teaching students the importance of plastic mitigation in the ocean, as well as ongoing training for different populations of community members on how to use the device. To ensure the training programs are efficient and educational, Seaside is developing a working operational manual with training materials and put together a meaningful and comprehensive presentation of how the

BluePhin is used to clean up local waterways. Seaside is also partnering with end users of the marine debris- a project still under discussion. This could lead to the development of a waste collection program for harbors and marinas in the north shore, but can eventually expand throughout the United States as well as globally. Seaside will use its many connections with local, regional, and national organizations to assist in developing the educational materials and protocols.

Working with children and their teachers from our growing list of local public and independent schools will have a dramatic effect on this project and its overall adoption. The staff at Seaside is developing a curriculum around hosting school groups for a three-pronged curriculum around

marine debris called "Reclaiming the Sea from Marine Debris." The curriculum will be divided into pre, peri, and post activity sections with a hands-on, STEM approach which is aligned to state frameworks.

Lessons and activities provide an opportunity for students, teachers, and families to interact with actionable resources to aid in plastic mitigation and awareness. The activity portion will also allow participants to apply knowledge learned in the introductory portion of the curriculum through field trips to local coastal resources. The concluding portion of the curriculum will take place towards the end of a 3-5 day process and will inform as well as encourage participants to incorporate environmental stewardship in their daily lives in order to better their communities.

- **Pre (Part 1) WHAT?** Explains WHAT the issue is - Seaside will provide the classroom teacher (K to College) a wide array of professional resources used to activate their students to understand these issues. The curriculum will offer specific choices to the instructor who can then tailor it to their class and their specific needs.
- **Peri (Part 2) SO WHAT?** Demonstrates SO WHAT is the issue first hand - Seaside hosts school groups for an hour or two "field trip." Students interact with three drones, flying (DJI Phantom), swimming (BluePhin) and underwater (FIFISH) all fed back to wide-screen TV's safely on shore under a tent.
- **Post (Part 3) NOW WHAT?** Provides educators and students NOW WHAT actions they can take - The curriculum includes dozens of ideas and how to guides where necessary to explain what individuals, families, classes, and citizens can do individually and collectively to help add actionable steps in mitigating marine debris.

The curriculum is designed to include a comprehensive array of activities to get kids engaged and understand the impacts trash has on our ecosystem and all living things that need a healthy environment in which to survive. Our curriculum can also be designed around bringing equipment into schools for in-classroom or school-wide training with exciting videos and lessons. Potential field trip curriculum could include:

- Providing the full spectrum of how waste enters the oceans, how to prevent it and what individuals and families can do to prevent waste from entering the oceans;
- Teach explicit lessons of reduction of consumption as being the root of the waste production cycle;
- Providing students an opportunity to operate the BluePhin;
- Using Seaside's underwater drone called the FIFISH which allows the user a 100 meter

underwater real time experience with feedback to a computer screen - participant driver experience included;

- Using Seaside's sky drone to automatically follow the path of both the BluePhin and the FIFISH - participant driver experience not included;
- Provide school groups with videos taken on location to discuss back at school;
- Provide school groups with a "now what" cadre of potential projects they can undertake (with or without Seaside's support and guidance) mitigating plastics and waste in their communities.

Seaside Sustainability has well-established connections, outreach, and collaborative training experiences with students from various local colleges such as Endicott, Gordon, and Salem State (and many many more in Boston area and beyond). There are also connections made with fifteen local elementary, middle, and high schools (both public and independent) whose staff and students would be participating in BluePhin's training programs and events. Seaside's internship program, which is rooted in education and hands-on learning, allows interns to be directly involved in the operation and organization of the BluePhin's pilot research and beyond. Because our interns are local, national, and even international, this program is able to serve a variety of places and individuals. The goal is to get as many people as possible involved and educate the community on this important issue, so we would like to partner with local cities, towns, Rotary Clubs, and other organizations to help complete it. There will be more of an emphasis on training programs for students that come from schools in cities and towns whose groups have helped fund the BluePhin project.

We plan to bring this project to a wider audience while promoting the issue of plastics in the environment and our funder partners as local leaders in this effort. There will be no denying that this device will receive a significant amount of attention. With a well-tuned marketing strategy, we believe the BluePhin has the ability to draw attention to itself, the effort to mitigate plastics and debris, and the local and global issues behind marine debris.

Why This Issue is Important:

Marine debris and pollution is a huge global epidemic that affects the environment and all living things. Marine debris is any human-made, solid material that enters coastal and ocean waters directly or indirectly. Direct transport of marine debris includes, but is not limited to, littering, dumping, or being swept overboard; while indirect transport occurs by being washed out to sea via rivers, streams, storm drains, and more. Both direct and indirect means of debris entering the ocean is a

problem and is especially relevant in the coastal communities of Massachusetts. The problems associated with marine debris extend well beyond aesthetics. Sea animals such as seals, fish, turtles, sea birds, and others can be choked, starved, or poisoned when they mistake debris for food. Animals can also become entangled in nets, bags, ropes, and other trash, often resulting in drowning, suffocation, loss of mobility, or starvation. Along with animals, humans are directly affected as well. Beachgoers may injure themselves on items such as pieces of glass, wood, or metal while swimming or walking on the sand. For boaters, marine debris poses a threat to navigation: propellers can become jammed with fishing line, boats can be damaged by colliding with large pieces of debris, and plastic can clog cooling intakes.

(Figure 6 Plastic Ocean - Source: Ocean Conservancy)

Although many of these causes are out of the average citizen's control, it is important to become educated about them and to work collectively to mitigate the impact of plastic pollution. There are many organizations and individuals trying to find solutions to these problems, but there aren't many that are trying to prevent waste from entering the ocean from other waterways, such as harbors,

rivers, canals, etc. The BluePhin's unique in this way, as it is a device that can help with the prevention of debris ending up in the oceans. Prevention is far more helpful than trying to clean up the mess that accumulates in our vast ocean and is harmful to marine life. This device combined with the educational tools Seaside will provide to the schools and communities will result in long-lasting effects that are beneficial to humans and the marine environment.

The coastal community of Beverly and Gloucester, MA are harbors that Seaside Sustainability has great confidence in the deployment of the BluePhin and its ability to have a significant impact in the clean-up. Based on careful evaluation of these locations and the BluePhin device, as well as Seaside's expertise in the plastics mitigation and marine debris field, Seaside believes that this technology combined with an informed and active community is a viable solution to a global epidemic. There are many ways that citizens can get involved, such as participating in local cleanups, reducing the amount of waste you produce, reusing items and recycling as much as possible, and educating their peers. Seaside

Sustainability, along with many other organizations, is key in the fight to clean our oceans and prevent plastics and marine debris from entering. The BluePhin is one avenue that makes this possible.

Solving Potential Problems FAQ:

- Is it possible that the BluePhin will not be seen by others through a large amount of traffic from recreational boaters in waterways, fog, etc. and can get destroyed? *BluePhin Technologies has never faced such issues and has taken steps to insure the the unit and operation in the incident of a mishap.*
- Can the BluePhin survive against heavy waves? *Yes, the BluePhin is persistent against heavy waves. It can safely and effectively operate against seawaves measuring up to 4 ft.*
- Does the BluePhin maneuver well after bumping into a piling? *Yes, the BluePhin can turn around but has been designed to fend off collisions-all integrated in its anti-collision feature.*
- Does it know when it's full? *Yes, it deposits all material in the "Smart Waste Bag" and is designed to return to its initial position automatically when it is full. The BluePhin dumps into a receptacle in the bottom, recharges on top, then goes back out on its mission. It slows down when it's full.*
- Is the BluePhin able to collect plastic that gets stuck to reeds (especially in small rivers)?

  The BluePhin cannot go through reeds but there are thrusters that can pulse and extract plastic

back away from reeds (his feature is only available in a manual setting at present).

- What if it sucks up an animal? *It functions at speed appropriate enough for any neighboring marine life to avoid any fatal interactions with it. Marine wildlife usually swim or fly away from it.*
- Does the BluePhin work in all temperatures? *Higher temperatures have been seen to have no significant effects on the BluePhin but there are possibilities of the machine being stuck on ice over quarter inch. The BluePhin battery life has been observed to be affected at higher temperatures. The most optimal conditions for its operations include warmer temperatures where extreme weather will not be an issue.*
- How does it avoid beaching itself? *In the incidence of the BluePhin encountering any beaching troubles, it will alert the operator can activate the reverse thrusters to divert away from the beach/surface.*
- Are there any problems with stealing or tampering? *There have been no problems reported with respect to stealing or tampering.*

Disclaimer: *The following information reflects the information concerning BluePhin and its features. The information discussed and questions are in no ways, renditions or works of Seaside Sustainability and are placed merely for informative purposes. The information discussed here is for information purposes only. Seaside Sustainability assumes no responsibility for errors or omissions in the contents of the Service.*

In no event shall Seaside Sustainability be liable for any special, direct, indirect, consequential, or incidental damages or any damages whatsoever, whether in an action of contract, negligence or other tort, arising out of or in connection with the use of the Service or the contents of the Service. The company affiliates reserve the right to make additions, deletions, or modifications to the contents on the Service at any time without prior notice.

BluePhin Budget:

Item	Cost - 1 Year	Cost - 5 Years
BluePhin Autonomous Model + Remote Control	$8750	$8750
Delivery, Taxes, Import Duty	$1500 (import duty & exchange rate 01.01.2019	$1500
V-Neck & Plug & Play System	$1150	$1150
Lipo Battery & Charger	$1100/replace 1-2 years	$1950
Purchase & Installation of Running Lights & Nav Bell	$850	$850
Inland Marine Insurance Schedule	$775/year	$3100
Thrusters	$1450	$1450
FPV Camera + Display	$1220	$1220
Repairs	$700/year	$2800
Water Quality Monitoring Systems	$1500	$1500
TOTAL	**$18,970**	**$24,520**

Meet BluePhin

BluePhin is a smart robot that can collect floating waste in commercial water bodies. It is one of the world's most technologically advanced waste management solutions. It collects plastic, algae and other debris to tackle marine pollution in lakes, ponds, canals, marinas, ports and coastlines.

SPECIFICATIONS

(Figure 9 - BluePhin Technologies)

Seaside Sustainability, Inc:

Seaside Sustainability is a 501(c)3 nonprofit organization that encourages members of the community of all ages to build and nurture a relationship with their local landscapes and seascapes. Seaside accomplishes this through its various programs and initiatives that educate people about the significant costs of environmental degradation, and by providing resources to develop skills, solutions, awareness, and community involvement to counterbalance society's ecological impacts. These multiple hands-on experiences engage communities on pressing environmental challenges, ultimately raising awareness about the health of our shorelines and waters in addition to marshaling citizen stewardship of these unique natural resources.

Seaside Sustainability collaborates with local, regional, and national partners on projects and is actively engaged in extensive research and mitigation on the prevalence of plastics in our ecosystem. Our dedicated staff, which consists of our board members, interns, and volunteers of all ages and geographical locations, is working on multiple plastic mitigation initiatives, including: marine debris trawls, local government single-use plastics ordinances, water quality testing for plastics, coastal cleanups, Clean Harbor Initiative for skimmers and sea bins, monofilament containers, and more. Through these programs, Seaside elicits involvement from the greater community and inspires lasting change while working with over 550 volunteers a year from students of all ages, members of the community, scientists, families, and more.

This partnership with BluePhin Technologies and the impending purchase of the BluePhin will be an influential addition to Seaside's cadre of sustainability and educational programs. Once purchased, Seaside will handle all planning and logistics involved with the aqua-drone, including the operations, management, storage, waste collection and separation, education, partnerships, insurance, and outreach. In addition to Seaside's extensive Plastics Mitigation program, it has other programs that are interrelated in sustainability and education:

- **Marine Citizen Sciences:** Our dedicated staff is working on multiple different initiatives with real data collection protocols including marine debris trawls, invasive species assessment and mitigation, mudflat acidification testing, eel and fish migration, eelgrass monitoring, and water quality testing.
- **National STEM Honor Society:** In collaboration with a cohort of regional and national partners, Seaside is working on launching National STEM Honor Society (NSTEM) in fall 2019 and will highlight the creation of more opportunities for our nation's underserved populations in STEM disciplines. NSTEM chapters include students from elementary, middle, and high school as well as the college level.
- **Green Scholars:** Green Scholars is a school-based sustainability Project Based Learning (PBL) Curriculum for middle and high schools which is built on the foundation of project management, leadership, and sustainability with an ultimate goal of making a school more sustainable. The Scholars Program is in a class all its own; based on the experiential education model, this course cultivates empowered, informed and progressive student leaders who—in collaboration with community partners—will be ready to face 21st-century environmental challenges.

- **Internship Program:** Seaside's internship program is hands-down one of the best! With its roots firmly seated in education and hands-on learning, there is no doubt that is why 50 interns work for Seaside projects and initiatives at any given point throughout the year. Seaside interns come from near and far and range from middle school age to graduate students and more than 250 thus far have volunteered. Interns are given real projects with real ownership and with the professional guidance to not only succeed, but to soar.