

## **The Recycled Repurposed Reused Floating Filtering Island Project**

The Floating Island Project is a reduce, reuse, recycle and repurpose program that works to improve water quality in local ponds, lakes, streams and rivers through natural filtration methods via floating islands created with recycled water bottles and other reusable materials. The project helps to reduce plastic and discarded items in our landfills, educates the public on the need to recycle and restore wetlands and habitat, and offers citizen science, public and youth opportunities to get actively involved.

The islands can be designed small enough to service and filter small stormwater catch basins or sized-up for larger drainage swamps, ponds, lakes or rivers. Additional benefits are the creation of wetland buffers to help filter stormwater and increase natural habitat restoration. The floating islands can remove nitrogen, phosphorus and other pollutants naturally, remove items from the landfills, and attract and provide habitat for plants and animals.

Working with a local non-profit student leadership organization and the city of Greenville's city park, our youth leadership team coordinated with a local high school principal to allow the collection of discarded plastic beverage containers from the school cafeteria during lunch time over a period of six weeks. There is currently no effective recycling program in place for the county schools nor is it a priority. We collected and removed from the landfill just over 10,000 water/beverage bottles and helped to raise awareness about the need to recycle with the 1,500+ students and staff of the school. Based on the number of students, we can safely estimate the amount of plastic we could potentially remove from the local landfill would be impactful if the public school system would convert to mandatory recycling.

Below is a materials list and step by step instructions along with photographs on how to construct your own island.

**Step 1:** Obtain permission to construct and place your floating island on a stormwater catch basin, pond, lake or river. Determine the dimensions and this will dictate the supplies needed for construction. Begin your floating island project by recruiting and forming your construction team. Once you have your volunteers you will begin by removing all plastic wrapping from the bottles and disposing of them properly.

### **Materials List:**

Black Rigid Gardening Netting - 2, 8ft by 8ft pieces (for the bottom and top layer)

Plastic Safety Construction Netting - 17ft by 8ft piece (helps to contain the bottles in layers)

Plastic Bottles - 500 empty plastic water bottles (If any are left over, save them for the next island)

Large 4" PVC Black Piping - 4, 8ft pieces of pipe (can be perforated or solid)

Pliers - To cut netting and zip tie excess

Mulch - 50 lbs. (landfill mulch)

Local Indigenous Aquatic Plants – 20 per island – juvenile non-invasive small plants

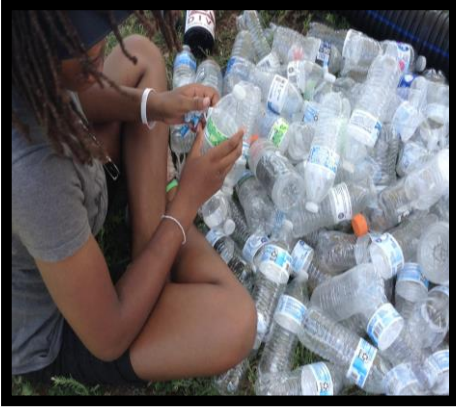
Zip ties - 4 bags of 18in & 4 bags of 12in

Concrete Anchors – 2 ea 50# bags of concrete and 2 ea 5-gallon buckets or recycled cinder blocks

Steel Cable - 2, length needed depends on the depth of your body of water

Burlap - 25 yards or used cotton linen can be substituted, i.e. old bed sheets and blankets

**Step 2:** Remove all wrappers and loose debris from every bottle. Recycle or properly dispose of all non-essential plastic; set aside remaining bottles. Measure out and cut black bottom netting and cut the pvc black drainage tubing to fit the entire perimeter of the bottom. Fill the pvc tubing with water bottles to maintain buoyancy and seal the edges with spray foam if needed. Attach the pvc to the bottom netting with 12" zip ties securely. Once the square is formed, begin to add your first layer of water bottles, neatly in rows. Use zip ties to connect the corners. Check the frame by lifting and add more zip ties if needed.



**Step 3:** Plastic barrier safety netting can be found in green or bright orange at most any construction site and is used by road and landscape crews to control traffic and debris. It works well as a layer to help the plastic bottles maintain even layers and form. The safety netting will act as a security layer over the black netting and with a layer to go over the top to prevent bottles from escaping. Take the twelve-inch zip ties and attach the construction netting along the edges of the tubing and throughout the frame.



**Step 4:** Once the construction safety netting is firmly attached, begin laying bottles out in neat rows facing the same direction until the entire island is completely full. After filling the inside perimeter with three layers of bottles, place another layer of green or orange safety netting to maintain a flat even layer and island shape. It is recommended to attempt to zip tie and secure the top netting in the middle creating 4 smaller squares within the larger island.



**Step 5:** The bottles and netting will now be covered in burlap, used coffee bean bags, or recycled cotton linens. This burlap will act as the support for the mulch/soil and the plants and as a semi-permeable divider, so water can naturally seep through and protect the soil and plants during its first year of growth. The burlap should be laid on top in an equal and even layer; cut enough so there is a slight overlap of the construction netting, but not too much where it is overlapping the tubing. After laying out the burlap over the top, ensure no bottles can be seen. Once bottles are no longer visible, place your second layer of rigid black gardening netting on top of the burlap. Secure the netting with your remaining 18-inch zip ties connecting it along the edges to the bottom piece and tubing. This is the step that ensures the durability of the island.



**Step 6:** The island should now be able to float and maintain shape without losing any bottles. Test float your island. Once tested, the island is ready for soil and mulch. Spread it evenly over the top of the structure so you no longer see any burlap with at least a 4" layer. Plan your planting and begin by shaping holes in the mulch and cut through the burlap and plastic barriers. We recommend planting root balls through the layers and verify they are submerged into the water line. Otherwise, they will not survive.



**Step 7:** After planting, ensure again that all root balls are touching water (test this by just letting the island float for a small amount of time). The island is ready to anchor in place. You can secure the islands to adjacent trees or sturdy posts if you do not want to make anchors. The downside to anchoring to the bottom is the need to accommodate for water level changes in flood prone areas. Make the anchors at least two days in advance to allow the concrete enough time to cure. Two 50# bags of concrete mix will make 3 five-gallon bucket anchors. Place the safety cable of rope into the bucket before the concrete dries. Place the anchor rope or cable in the middle of three of the sides of the island. Place the anchors on the island or in kayaks and float it into the position selected. Ensure everyone is clear and release the anchors. We recommend you allow for five feet of extra cable than then the actual depth of body of water.





**Who We Are: Love A Sea Turtle – LAST is a 501(c)(3)** dedicated to marine and ocean conservation awareness by engaging students in leadership development and environmental stewardship, inspiring others to get involved in year-round service projects and conservation activities, and providing nature-based programs for under-served youth. For the past 13 years, we have grown and evolved our work ensuring at-risk youth are involved and seeking ways to provide a platform for youth voice. We are so much more than a sea turtle awareness and education program. To understand the depth and breadth of our work, review our web page and social media: [www.loveaseaturtle.com](http://www.loveaseaturtle.com) and [www.facebook.com/loveaseaturtle](https://www.facebook.com/loveaseaturtle)

As an organization, we have partnered, collaborated and initiated trail building and restoration projects, park clean-ups and beautification events annually, river and land-based litter removal, sustainable farming and community gardens, local, statewide and national environmental education projects, and conduct year-round youth leadership and engagement events. We will use the funds to construct and place six additional floating islands in different bodies of water in North Carolina. The goal is to encourage an increase in school system recycling, help to create more habitats, filter and clean specific water bodies with higher nutrient levels, and inspire students and residents to get educated and involved.

**Project Update:** After Hurrincane Florence





The islands have weathered long periods no rain, a tropical storm and one hurricane since they have been launched. Notably, their have only several plants that have not survived and we can transplant and divide some of the plants in the spring. We added more rope and cable to accommodate extreme seasonal flooding.

We will have to address native bird species residing on the island this winter by placing hazard tape and stakes to prevent roosting and total vegetation removal. Our first impression and observations is that the island design appears to be successful in enabling native aquatic plants to survive and grow and future results in creating habitat and improving water quality are not available or quantifiable at this time.

