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« Bay Grasses in Classes » Implemented by Tampa Bay Watch

Project Summary - Part I.

Description Participating organizations and geographic location(s) of the project.

Bay Grasses in Classes (BGIC) is designed to restore coastal wetlands while encouraging environmental stewardship. Our region lost nearly half of its wetland habitats due to the rapid development of the Tampa Bay region. These habitats are vital to preventing erosion, filtering pollutants, providing habitat for juvenile fish, and sequestering atmospheric carbon. By establishing sustainable wetland nurseries at local schools, we not only give students the opportunity to work with local scientists restoring this crucial habitat, we also provide plants and labor to local and state agencies at no cost. Hillsborough, Pinellas, and Manatee County school districts; Florida Fish and Wildlife Conservation Commission (donor marsh), Hillsborough, Pinellas, and Manatee counties (restoration sites), Southwest Florida Water Management District's Surface Water Improvement and Management

Background or problem statement

Coastal development in Florida has led to the destruction of coastal wetland habitats, decreasing coastal resiliency against erosion from storms and waves, pollution and sea level rise. Wetland plants like the grasses grown in BGIC nurseries help to hold soil in place with their dense mat of fibrous roots. This results in the build-up of soil, which provides greater coastal protection against storm surge and sea level rise. Additionally, the denser the marsh is with plants, the more wave energy is dissipated when waves pass through it. With a greater number of plants in the marsh, there will be more roots absorbing nutrients such as phosphorus and nitrogen. These nutrients, if present in excess in the ocean, can cause eutrophication which can lead to problems like red tide. Carbon dioxide is another compound that can be harmful if too concentrated in the oceans or in the atmosphere, causing ocean acidification and climate change. Salt marshes store carbon at a higher rate per unit area than temperate forests, and the older the marsh, the more carbon it stores. This is because the underlying soil is anoxic, so dead organic matter takes a very long time to decompose once buried in the soil. The BGIC program focuses on restoring coastal wetland habitats with wetland grass species in order to address these concerns as well as to provide habitat to other species, promoting habitat succession and biodiversity.

General description of the project

This project successfully provided a hands-on educational experience for local students while also providing coastal sites around Tampa Bay with the plants they need for habitat restoration. During the course of this grant cycle, 19 schools have been enrolled in the program with 18 nurseries in Pinellas, Manatee and Hillsborough counties. Species grown in the nurseries include *Spartina alterniflora*, *Spartina patens*, *Paspalum vaginatum* and *Juncus roemerianus*.

Description of outcomes and follow-up

Over the course of this grant period there have been a total of 18 BGIC events involving 819 students and teachers as well as 9 community events involving 168 volunteers. 24,345 plugs of wetland grasses have been used in coastal restoration. After each transplanting event, baseline pictures of the planted area are taken and geo-referenced. The acreage area is also mapped using a sub-meter Trimble. The sites are monitored every 6 months for a period of 2 years and each time, the same areas are photographed from the same angles in order to show progression and succession. The results of these transplanting and monitoring efforts are uploaded onto the Tampa Bay Watch website, where maps of the planting sites

show the areas planted as well as the monitoring pictures taken at each site. The pictures are a useful indicator of habitat succession as mangroves can often be seen settling in the salt marsh about a year after the restoration event took place. For more information, please contact either Melinda Spall (mspall@tampabaywatch.org) or Matt Flynn (mflynn@tampabaywatch.org).

Successes

During this grant period, we began implementing a new, more sustainable method for planting and harvesting plants from the nurseries that produces less waste and reduces the number of steps in the process. By transitioning to using nursery pots instead of trays to plant nurseries, we are able to plant more plants at a time, clumping a number of individuals together into one pot. This makes harvesting and planting the nursery more efficient. When harvested, the plugs in each pot can easily be removed and split into average-sized plugs for planting at a restoration site. The other benefit is that all of our pots are made from recycled plastics and are donated to us after being used. These twice-recycled pots have the advantage of using less plastic than would be used if planting the same number of plants in trays. Another significant success this year has been to gain a better understanding of what certain teachers would like their students to gain from their participation in the BGIC program. At the annual Teacher Retreat, all of the BGIC teachers were asked about the in-class lectures that are provided and how to focus them to fit the curricula and education standards. The strategy has been to develop our lectures specifically to fit the educational needs expressed by the teachers. The success of the BGIC program is gauged by the number of students involved as well as the number of plugs used in restoration efforts. Involving students in hands-on restoration work can instill them with a sense of ownership and responsibility for the habitat they restored. Ideally, participation in the BGIC program will encourage some of them to become the environmental stewards of the next generation. Each student involved adds to the likelihood of inspiring new environmental stewards. Each plug transplanted adds to the amount of habitat restored, bringing the acreage of Tampa Bay coastal wetlands closer to where it was before the decrease due to coastal development.

Challenges

One of the biggest challenges in implementing the project has been scheduling events around the rigid schedules of teachers and the field trip restrictions that schools have in place. Certain schools do not allow their students to travel out of the county on a field trip, so only certain sites are acceptable for those schools. This is difficult to balance, because the greatest need for restoration is not always in an area approved by the schools that are ready to plant. This creates a need to maintain multiple options in each county in order to optimize our restoration efforts. Scheduling around school events can pose difficulties as well because each school's nursery will be ready to plant at a different time, which doesn't always align with their availability or the availability of a restoration site. Growing new species also posed new challenges. When a new species is added, the plants either need to be purchased for the initial planting or a donor location in which they can be harvested needs to be identified. Nursery-grown plants tend to be expensive so we typically look for permission to harvest the plants from a donor location. This can be challenging as those sites are often difficult to get to, especially with a large group of students.

Lessons Learned

During the course of this grant, some important lessons were learned that will aid us in organizing and coordinating the program in the future. Firstly, we learned that teachers feedback can be invaluable to us, especially regarding the best methods for teaching students the material that we cover in classroom lectures. At our annual BGIC Teacher Retreat, we asked all of the teachers what topics they would like for their students to learn about based on the educational standards of their school programs. This helped us immensely in gauging the relevance of certain topics as well as the difficulty level of the material. Another lesson learned in 2018 was that hiring professionals can help us optimize certain parts of the program. For example, we hired a professional lesson planner to help us devise hands-on activities for students to take part in as well as to help us optimize our lectures with appropriate vocabulary and lesson chronology. We hope these lessons will help us to provide an ideal educational experience to students in the BGIC program and more effectively encourage them to remain involved with restoration and other environmental efforts after their participation in the program has ended.

What next?

As more wetland habitat is restored around Tampa Bay, the need for diversity in BGIC nurseries becomes increasingly important. There are several species that we have grown successfully in various nurseries so gradually shifting some of our other nurseries to growing different species can help ensure that we are providing a diverse, and resilient restored habitat. Wetland grass species tend to occupy slightly different elevations as well, so in many cases they can be planted at sites that have been restored previously without intruding on the space already occupied by other restored species. Restoration is only part of our goal as we are just as invested in educating and inspiring potential future environmental stewards from the upcoming generation. Since we often only have a few semesters to work with some of the students, we use other methods to encourage them to stay invested in the work they have done. Our semiannual monitoring protocol involves posting maps of the progression of each restored site onto the Tampa Bay Watch website where they can be easily viewed by anyone who is interested. This ensures that our influence doesn't have to stop when the students graduate or move to a different school. Successful results from a restoration effort can foster a sense of ownership and responsibility for the environment, especially when students are able to see the impact that their work had over a long period of time. We hope to continually inspire former participants as they move into their careers and ideally dedicate more of their time to protecting natural ecosystems. The goals of the program are to restore habitat and inspire the youth to take on the challenges of environmental conservation, so any other organization or school is welcome to adapt our program to fit their own circumstances. To help facilitate this we provide our operations manual on the Tampa Bay Watch website. The more our program is implemented, the more impact it will ultimately have.

For more information on this project, please contact:

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