

Native Wetland Planting Program

# ADOPT-A-NURSERY

## VOLUNTEER HANDBOOK



A guide for community wetland plant nurseries  
in partnership with Tampa Bay Watch



<https://tampabaywatch.org>

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# WELCOME

## TO THE ADOPT-A-NURSERY PROGRAM

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Thank you for giving your time to volunteer with the Adopt-a-Nursery Program! The program provides the opportunity for community volunteers to participate in hands-on restoration of degraded wetland habitats around the Tampa Bay watershed.

In collaboration with our various partners we build wetland nurseries in public locations that act as donor nurseries, providing plants for community plantings to help restore valuable wetland habitats that provide numerous benefits for our waterbodies, promote biodiversity, improve water quality, and provide unique habitats for wildlife. We thank you for sharing your passion and especially your time to improve the quality of our coastal wetlands and help restore our lost habitat.

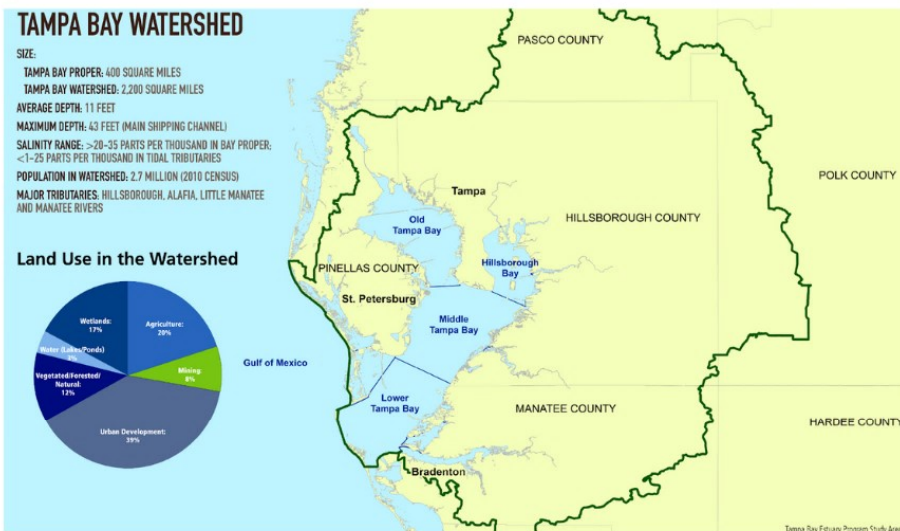
*Tampa Bay Watch is dedicated to fostering a healthy Tampa Bay watershed through community-driven restoration projects, education programs, and outreach initiatives.*

## **BACKGROUND INFORMATION**

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Tampa Bay is an invaluable resource that is fundamentally important to maintain and sustain for future generations. Tampa Bay is Florida's largest open-water estuary extending 400 square miles, with a watershed more than five times that large, covering 2,200 square miles. Supporting a variety of habitats including estuarine wetlands, freshwater wetlands, upland forests, seagrass beds, and submerged hard bottom, the Tampa Bay area is home to a wide variety of plants, animals, and a growing human population of over 3 million people.

Coastal wetlands are some of the most valuable and diverse ecosystems on the planet and provide numerous benefits to coastal communities. Healthy coastal wetlands improve water quality, mitigate the impacts of sea level rise, support commercial fisheries, provide wildlife habitat, and act as long-term blue carbon sinks. Despite their significance, coastal wetlands in the Tampa Bay area have suffered extensive damage due to the overwhelming amount of shoreline development, resulting in the loss of more than 40% of these beneficial ecosystems. Through our Native Planting Program, we provide the opportunity for students and community members of all ages to participate in habitat restoration projects while creating a sense of responsibility to protect these vulnerable habitats.



Source: Tampa Bay Estuary Program

In an effort to restore lost habitat, TBW utilizes native plants in a variety of restoration projects that contribute important functions such as:

- Stabilizing shorelines and protecting against erosion
- Providing habitat, nursery areas, and food for wildlife
- Absorbing wave energy from storms
- Filtering pollutants and marine debris from entering our waterways

## **PROGRAM DESCRIPTION**

Tampa Bay Watch’s Adopt-a-Nursery program facilitates the establishment and maintenance of wetland plant nurseries by community volunteers. These nurseries provide an inexpensive source of native wetland plants to be used in the many federal, state, county and city habitat restoration projects in the Bay area. By raising the plants to maturity in our own nurseries, many expenses are curtailed and the cost of a planting project to government agencies is lowered significantly.

The Adopt-a-Nursery program also provides a volunteer base for implementation of restoration projects and promotes community involvement in hands-on restoration activities. With guidance from Tampa Bay Watch and restoration partner staff, volunteers maintain the nursery and monitor their plants by performing salinity tests, removing weeds and algae, preparing plants for transplanting, conducting routine maintenance and documenting other pertinent information.

# NURSERY CYCLE

To produce plants for restoration activities, a nursery must be constructed and planted. Once the nursery is constructed, the plants are harvested from a donor marsh or purchased from a local nursery. The plants are planted in the nursery and then grow for 6 – 8 months before they are used in a restoration project.

Next, one half of the nursery is harvested and transplanted at a restoration site. The remaining plants will be split and recycled throughout the nursery to begin the growing process again. An established nursery program will follow this cycle of growing plants, harvesting, transplanting, and finally recycling. As long as the nursery is well cared for and the plants are maintained in a healthy condition, the nursery cycle can continue indefinitely.



# VOLUNTEER QUALIFICATIONS

This opportunity is for volunteers interested in performing wetland nursery maintenance practices outdoors who are enthusiastic about plants and habitat restoration, communicate well with staff, and don't mind repetitive tasks like weeding (sometimes for extended periods of time).

Volunteers must be 18 years of age or older. Volunteers below the age of 18 years are welcome to volunteer with a parent/guardian on-site. Participants will be invited to join a volunteer training session prior to their first scheduled volunteer shift to be educated on the ecology of wetland ecosystems, the benefit of wetlands to coastal communities, and trained to properly care for their adopted nurseries.



## **Volunteers should be willing and able to:**

- Perform general gardening chores including pruning, planting, weeding, watering, and harvesting
- Work in hot weather
- Stoop and bend
- Identify plants or learn plant identification skills
- Lift 35+ lbs. (not necessary but a plus)
- Submit Nursery Care Datasheets for any time spent maintaining or caring for the nursery(ies)

# NURSERY CARE & MAINTENANCE OVERVIEW

Volunteers will be recruited, selected, and trained by Tampa Bay Watch staff through the “Adopt-a-Nursery Program.” Volunteers will be scheduled to make routine nursery care visits at least once every 2 weeks on a rotating basis. Scheduling for each week will be coordinated with volunteers in advance and volunteers are given the flexibility to choose when to conduct their nursery care visits as long as they occur during the Nursery Host Partner’s operating hours.

## **Canceling a Volunteer Shift**

If expecting to be absent from a scheduled shift, volunteers should contact Tampa Bay Watch staff by email as far in advance as possible so that alternative arrangements may be made.

## **Volunteers will be trained to:**

- Remove weeds, algae, and debris from the wetland nursery when necessary;
- Weekly checks of automatic irrigation system;
- Manually water nursery when necessary;
- Monthly checks (at a minimum) of salinity and pH to ensure that they are at appropriate levels (prior to planting, biweekly checks of salinity are required);
- Overall maintenance of the nursery itself;
- Prepare/pull plants for plantings (see nursery harvest events);
- Submit Nursery Care Datasheets for any time spent maintaining or caring for the nursery(ies).



# NURSERY MAINTENANCE

## SUPPLIES LIST

Tampa Bay Watch will provide any supplies needed for the nursery(ies). These include plants, soil, salt, pots for planting, nursery materials, timer, irrigation materials, hydrometers, and any other materials needed, within reason. Below is a list of supplies for regular nursery maintenance:

- Gardening gloves
- Hydrometer or refractometer used to measure salinity
- pH paper
- Water droppers
- Salt (for use only in brackish nurseries)
- Five-gallon buckets
- PVC pipe (for use in mixing salt solution)
- Muck bucket for use when weeding
- Batteries for the timer
- Gardening shears
- Push broom (for dispersing salt and cleaning algae out of nursery)
- Hand skimmer (for removing excess algae from water)
- Plant Species Information sheet
- Common Weeds Information sheet
- Disease ID cards

### **Other Volunteer Supplies to be Considered**

The following is a list of supplies that will be helpful for the maintenance and monitoring of the nursery to be supplied by individual volunteers:

- Gardening boots, water shoes, or shoes you don't mind getting dirty or wet
- Reusable water bottle to stay hydrated
- Cell phone for taking pictures or submitting monitoring data



# NURSERY MAINTENANCE

Maintaining the wetland nursery is vital to the plants' survival. The nursery must be monitored on a regular basis to ensure that the plants stay healthy and to catch any problems early enough to save the plants. Tampa Bay Watch is responsible for overseeing maintenance of nursery(ies) and providing nursery care when a volunteer can not be available for regular nursery check in. Please note that some community nursery locations will contain either brackish, freshwater, or both nurseries. Each of these nurseries will require different maintenance needs.

## **Brackish Nursery**

Brackish water is a mixture of fresh and saltwater. Estuaries and their surrounding wetlands are bodies of water usually found where rivers meet the sea, and are home to unique plant communities that have adapted to brackish water. The brackish nursery contains a variety of Florida native grasses and rushes found growing in salt marshes, tidal creeks and brackish ponds that require the salinity to be monitored.

## **Freshwater Nursery**

Freshwater plants provide important environmental benefits for Florida's freshwater ecosystems. The freshwater nursery contains a variety of Florida native freshwater grasses, rushes, and other emergent aquatic plants that are periodically or continually flooded, and are usually found in shallow wetland areas or around the edges of lakes and ponds. Emergent plants are rooted in water-saturated soils or submersed soils near the water's edge, and the leaves and stems grow above the water. Freshwater nurseries do not require the salt to be added for maintenance.



## Wetland Nursery Description

Our wetland nurseries are constructed by creating a square or rectangle frame using wooden posts and overlaid with a PVC or HDPE pond liner. Currently, our nurseries are roughly 16'x16' but there is flexibility in both size and shape of the nurseries depending on each restoration partnership's location. With our current nursery size, we can fit about 800-gallon pots within the nursery, and depending on the species, we usually can get between 2-4 transplantable plugs from each pot. Each nursery can easily provide plants for 2-3 plantings per year. We usually plant approximately half of each plant species at one time and spread out the other plants into the remaining pots for sustainability.

Nursery locations are required to be in full or mostly full sun and there must be a water source within 150 ft. of the nursery. In order to provide water for the nursery, an irrigation system is set up to connect a freshwater source near the nursery site. This system is designed to provide water flow into the bottom of the pond so the plants can take up water through their roots. This type of flow helps prevent fungus growth on the blades of the plants, and conserves water by slowing evaporation. The system should be equipped with a digital, battery operated timer to regulate watering of the nursery.

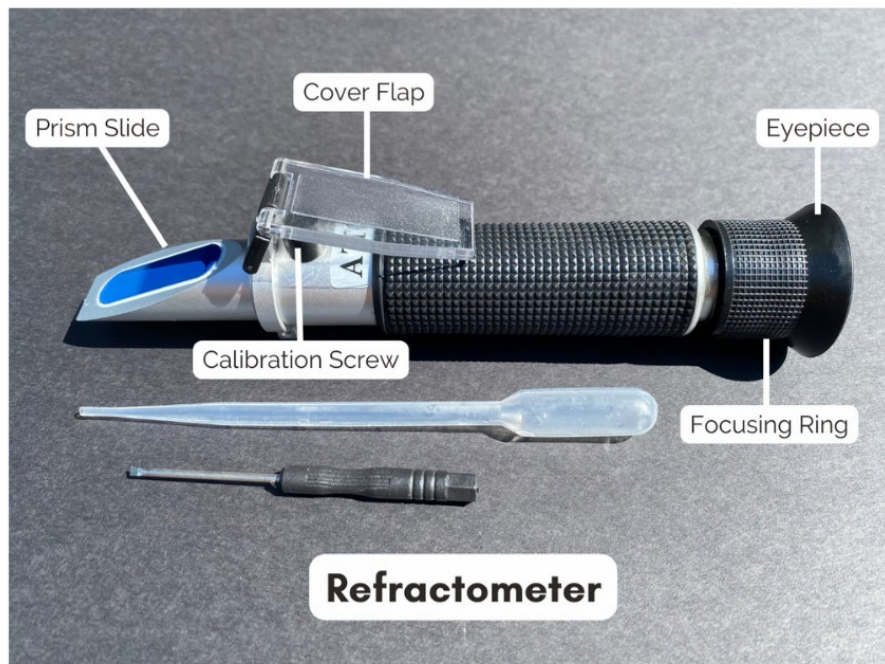


## Key Points for Maintaining a Healthy Nursery:

**Salinity:** Plant species growing in the brackish nursery are halophytic plants, which means that they do best in water that contains some salt. Salinity is measured in parts per thousand (ppt) and is tested either with a hydrometer or refractometer. Salinity should be maintained within a 10-20 ppt range with an optimal level being maintained at **15 ppt**. This is most important for the two months prior to transplanting or if there is an invasion of freshwater plants.

Too much or too little salt will result in poor growth and reproduction. Salinity should be monitored during every scheduled routine nursery care visit and may need adjusting after heavy rains. When testing the salinity of the brackish nursery, take several samples from different locations in the nursery.

Refractometers are optical instruments used for measuring concentrations of liquids. The main component of a refractometer is the prism. A few drops of liquid are placed on the prism. When light enters the liquid layer, it changes direction. This is called a refraction. The refractometer measures the amount of light shift, called the angle of refraction, which is converted to a useful unit of measure.



### **How to Use a Refractometer:**

1. Open the cover flap and aim the refractometer with the glass prism slide toward a bright light or a light source. If necessary, turn the focus ring until the scale is sharp.
2. Open the cover flap and wipe the prism slide with a soft cloth.
3. Apply a few drops of fluid to be measured to the prism slide.
4. Close the cover flap and press lightly so that the liquid spreads over the prism slide without forming bubbles.
5. Hold the device horizontally and wait 30 seconds for temperature compensation to work.
6. Read the value on the dividing line between white and blue in ppt units.
7. Clean and dry the prism slide.



Periodically calibrate the refractometer to ensure its continued accuracy using the provided calibration solution.

### **How to Calibrate a Refractometer:**

1. Shake the bottle of calibration solution well before using it.
2. Clean the glass prism slide and cover flap with clean fresh water.
3. Use a soft clean cloth to completely dry the glass prism and cover flap.
4. Add 2 to 3 drops of calibration fluid on the prism slide.
5. Allow 45 to 60 seconds and then check that the shadow line (the white-blue boundary) lines up with 35 ppt on the right-side scale.
6. If the shadow line is not at 35 ppt, remove the black rubber cap from the knob next to the prism. Use the tiny screwdriver to turn the knob until the shadow line is at 35 ppt. Replace the rubber cap and return the screwdriver to the case.
7. Clean the glass prism slide and cover flap with clean fresh water to remove the solution and dry with a soft clean cloth.



Hydrometers are instruments used to determine specific gravity that is converted to a useful unit to measure salinity. To use a hydrometer you must fill up the tool with water and then observe how much the lever is raised by the salinity.

### **How to Use a Hydrometer:**

1. Submerge the hydrometer in the nursery to fill it with water almost to the top
2. Dislodge air bubbles by tapping gently.
3. Place the tool on a level surface to read specific gravity in ppt units. Empty sample water back into the nursery.

## How to Add Salt to the Nurseries

1. To distribute the salt water throughout the brackish nursery, open the bag of salt and pour half of the bag into a five-gallon bucket. Break up any large pieces of salt as much as possible with your hands or using the provided PVC pole.
2. Fill the bucket halfway with water using the freshwater source located near the nursery.
3. Next, use the PVC pole to mix the solution until the salt is dissolved in the water.
4. Add the salt water solution to the brackish nursery by pouring the solution alongside the edges of all four sides and in the middle of the nursery.
5. Use the push broom inside the nursery to push the water around to further distribute the salt water solution.
6. Repeat these steps by adding the last half of the salt bag into the five-gallon bucket and distribute throughout the nursery.



**Water:** The plant species grown in our wetland nurseries live in habitats that are periodically or continually flooded with water. It is best to establish a watering schedule that mimics tidal or fluctuating conditions; however, water needs will vary with the nursery cycle. Right after planting or recycling a nursery, the water needs of the plants will be high. The plants will be in shock so it is important to keep them well watered.

The nursery should dry out between waterings to control algae growth but the inside of the pots should stay moist. If your nursery does not have a timer set up, please flood the nursery twice per week in the summer months and once per week the rest of the year. The nursery can be allowed to dry out 1 week prior to harvesting to ease the process.



**Weeds:** Most weeds are freshwater plants and cannot tolerate salt. Adding salt to the brackish nursery should keep them under control. The freshwater nursery may require hand weeding at routine intervals and attempts should be made to control the weeds before they produce viable seeds. Please refer to the Common Weeds Information sheet for plant identification and guidance.

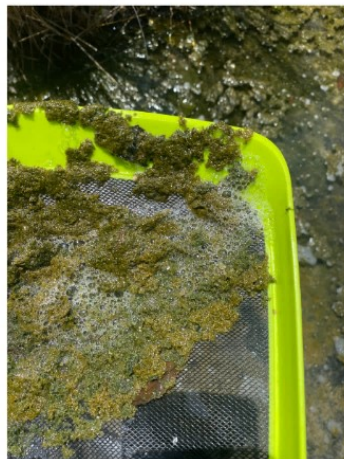
**Algae:** Algal blooms (rapid growth of algae) can kill the plants by depriving them of oxygen and nutrients. Drying out the nursery in between watering helps control algae growth. If excessive algae develops, try to remove as much as possible.

Much of the algae is filamentous which is long, thin, hair-like strands of algae that can combine to form mats and can be scooped out of the water. Suspended algae will cause the water to take on a greenish or gritty appearance and can be removed from surface water using the provided hand skimmer. If the algae swamp the plants (completely covers the surface of the water), it can be removed by allowing the nursery to dry and thus the algae to dry out. When the algae is dry, it can be lifted off the top of the nursery liner in sheets.



Filamentous Algae

Suspended Algae



### What is Algae?

Algae are a diverse group of organisms that have the ability to conduct photosynthesis but don't have roots or leaves. Rather they are collections of cells that remain individual or connect together into colonies that can form mats or even resemble plants.

**Disease:** Several diseases can harm the plant species in the nurseries. A chart is provided in this resource guide for you to ID the most common ones. If rust (a reddish leaf fungus), black spot fungus or white scale develops on the grass blades, please indicate this on your submitted Nursery Care Datasheet.

**pH:** pH is a measure of the logarithm of the reciprocal of hydrogen ion (H<sup>+</sup>) activity and the pH scale goes from 0 (acid) to 14 (alkaline) with pH 7 as the neutral point. Water pH is one of the most common water quality measurements made because it influences chemical, physical, and biological processes.

To test the pH of the water. Tear off a 1" piece of pH paper. Dip the strip into the water briefly. Hold paper up to color chart and read pH. Safe range 6.5 - 8.5. Ideal range is 7.5-8



**Battery-Powered Timers:** If the irrigation system's timer is battery powered check the functioning of the timer when monitoring the nursery. Timers are typically set for 25-35 minutes every 4-5 days, but are adjusted depending on specific nursery situations. Water needs will vary by climate so the water level should be monitored and adjusted accordingly.

Ensure that the timer is set to AUTO mode to maintain a reliable programmed watering schedule. The START TIME is typically set to 5:00 AM for early morning watering.



**Timer Features:**

DIAL	Rotate the dial to customize your watering schedule
STATION	Press to select the station you want to program
RESET	Press to clear all programming
+/- BUTTONS	Use these buttons to adjust time and system setup
MANUAL/CLEAR	This feature allows you to water without interrupting your set schedule. Use the + and - buttons to select watering time
SET CLOCK	Set the time of day
START TIME	Select what time you would like each Station to start
HOW LONG	Determine how long to water each Station
HOW OFTEN	Choose how often you will water each Station
OFF	Turn off all watering

**Timer Does Not Water Check if:**

- Timer is set to AUTO.
- Hose faucet is on.
- Batteries are low.
- Clock is set to the correct time, including AM and PM.
- Rain Delay is on.

**Nursery Care Datasheets:** Please submit a Nursery Care Datasheet after each routine nursery visit using the ArcGIS Survey123 online form. The information from the datasheets provides us with important information concerning the health of the plants and allows us to track volunteers' time spent working in or relating to the nursery that must be submitted for grant reporting. Fill out the survey and click submit at the bottom. The QR code below contains a direct link to the Nursery Care Datasheet.

**To Access the Nursery Care Datasheet Using the QR Code:**

1. Open the camera app on your cell phone.
2. Center the QR code to scan on the screen and hold your phone steady for a couple of seconds.
3. Tap the notification that pops up to open the link.



**QR Code for Nursery  
Care Datasheet**

**To Access the Nursery Care Datasheet Using Web Browser:**

Use the following link to access the survey through your browser:

**<https://arcg.is/1WXbyP0>**



# NURSERY CARE DATASHEET

What is the location of your nursery?: \_\_\_\_\_

First and Last Name of Data Collector: \_\_\_\_\_

Date: \_\_\_\_\_

Start Time: \_\_\_\_\_ End Time: \_\_\_\_\_

## Plant Variety in Nursery:

Brackish Water Wetland Plants       Freshwater Wetland Plants       Both

If brackish water wetland nursery, test salinity level prior to treatment (ppt)

To test the salinity of the water. Fill the hydrometer to the line with water from the nursery. Set the hydrometer on a level surface (tapping to remove air bubbles). Read the salinity in ppt. The safe range is 10-20 ppt. The ideal is 15 ppt.

Salinity (ppt): \_\_\_\_\_

If brackish water wetland nursery, salinity level after treatment (ppt)

Salinity (ppt): \_\_\_\_\_

## pH of Water:

To test the pH of the water. Tear off a 1" piece of pH paper. Dip the strip into the water briefly. Hold the paper up to the color chart and read pH. Safe range is 6.5 - 8.5. Ideal range is 7.5-8.

pH: \_\_\_\_\_

## Soil Moisture:

To test soil moisture, select 6 random pots in the nursery. Place a finger in the middle of a planting pot. The soil should be moist. The soil feels...

Dry       Slightly Moist       Moist       Soggy/Very wet

## Water level:

Dry (very little to low water)       Less than 1 inch of water

Between 1"-2" of water       More than 2" of water

## Irrigation Timer:

Is the timer on and working?

Yes       No       Unsure

## Overall Plant Health:

Healthy (good color, sturdy shoots, etc.)

Fair (some yellowing/browning, weak or soggy shoots)

Poor health (many plants look dead)

Other:

If other, please indicate condition: \_\_\_\_\_

## Level of algae in the nursery:

Full of algae       Moderate algae       Little algae       No algae present

# HARVESTING

To prepare the plants to be used in a restoration project one half of the nursery is harvested and the other half is saved for recycling. The nurseries should be ready for harvesting six to eight months after initially planting or transplanting.

Plants should ideally be harvested the day before being transplanted but can be harvested up to 3-4 days in advance. Plants should be kept in a shaded area between harvesting and transplanting as heat can be damaging to the plants.

## **Supplies Needed for Harvesting:**

- Gardening gloves
- Heavy duty scissors
- Grain bags (for placing plant plugs into for transport)
- Tarps (for covering working surfaces)
- Working tables

## **Harvest the plugs as follows:**

1. Turn off the water timer of the nursery a few days in advance of the harvesting date. Plugs that have had a chance to dry out are easier to harvest.
2. Remove half of each species of potted plants intended for transplanting from the nursery and place them near the work tables.
3. To harvest the plugs, take a pot and turn it on its side so the plant foliage is parallel to the ground.
4. The plant roots grow quickly and will most likely have grown out of the bottoms of the pots. It is much easier to remove the plants if excess roots are removed. Rip off any roots growing out of the bottom of the pots and save any root mats to include in planting.
5. Place your hand around the plant's base at the soil level and, using your other hand, turn the entire pot upside down. Allow the force of gravity to gently ease the plant out of the pot.
6. If the root system becomes dense, it may be difficult to remove the plant from the pot. For these instances, press or tap the sides of the pot to loosen the soil.
7. Once the plant has been removed from the pot, the plant needs to be split into sections for easier transplanting by using heavy-duty scissors. Each pot can usually be split into between 2-4 plant plugs.
8. Turn the plant on its side so the plant foliage is parallel to the ground. Take a look at the roots before you start separating the plant. Not all plants have the same types of roots and each root system needs to be treated differently when dividing. Look at the illustrations on the next page for examples on how to make the correct cuts. Great care should be given to preserve the maximum number of roots so that the plants will be able to anchor themselves and also take up water and nutrients.

### Spreading Root System:



Starting from the bottom of the root system, cut vertically using a heavy duty scissor. Once a large enough cut has been made, grasp the roots with two hands, one on each side, and place your thumbs into the root ball. Gently pull the plug in half, keeping as many roots intact as possible. If the roots are tightly intertwined, a slight twisting motion is effective to separate them. Use your hands to further pull the plant roots apart. If possible, repeat these steps on each split half of the plant creating up to 4 plant plugs from one plant. Make sure each section has a healthy section of roots and a few leaves.

### Fibrous Emerging from Tuber-like Rhizome:



Rhizomes are stems that grow horizontally at or above ground level. Cut plants with rhizomes or woody crowns (area where the stems join the root) apart with scissors or a knife, leaving 1-2 stems with a root part.

9. Place 50 plugs in each grain bag. This is done to keep count of the number of plant plugs harvested for transplanting.

10. Keep the bags of plants in a shaded area until it is time to transplant them. If not transplanting the plugs within 24 hours add a small amount of water into the grain bags to keep the root systems damp.

# RECYCLING

The plants that are left in the nursery after harvesting are to be split and recycled throughout the nursery to begin the growing process again. Recycling involves separating the existing plants in half and replanting them in pots with soil. The plants to be recycled will need to be removed from the pots and separated using the harvesting method. Once the nursery has been recycled, it will be monitored for the next 6-8 months until the plants are ready to be harvested and transplanted again. As long as the nursery is well cared for and the plants are maintained in a healthy condition, the nursery cycle can continue indefinitely.

# NATIVE PLANTING PROGRAM SPONSORS

The Community Wetland Nursery and Bay Grasses in Classes programs provide a source of native wetland plants for use in habitat restoration projects while giving volunteers and students a valuable hands-on experience in habitat restoration activities that emphasize the value of maintaining a healthy environment.

Our Native Planting Programs are made possible by the generous support of the Raymund Foundation, Bloomin' Brands Inc., the Community Foundation of Tampa Bay, and Scotts Miracle-Gro.



# RESOURCES

The following resources were referenced during the creation of Tampa Bay Watch's Adopt-a-Nursery Program Volunteer Handbook:

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# ABOUT TAMPA BAY WATCH

Tampa Bay Watch is a 501 (c)(3) non-profit organization dedicated to fostering a healthy Tampa Bay watershed through community-driven restoration projects, education programs, and outreach initiatives. Incorporated in 1993, our mission has been focused on mobilizing the Tampa Bay community to participate in ecologically impactful and meaningful projects and programs that emphasize the importance of community outreach, stewardship, and volunteer engagement.

Tampa Bay Watch opened a second facility at the new St. Pete Pier entitled the Tampa Bay Watch Discovery Center which opened in July of 2020. The Discovery Center has a public Exhibit Gallery to showcase the economic and ecological value of the Tampa Bay estuary to residents and visitors, and a classroom to expand educational outreach programs to Tampa Bay area schools.



## OUR CONTACT



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