To: Michael Perry/City of St. Petersburg

From: Jim Bays/Stewards of Our Urban Lakes

Ed Carlson/Jungle Terrace Civic Association

Subject: Jungle Lake Restoration Plan: Phase 1 Scope of Work –FINAL DRAFT

Date: March 29, 2023

Introduction

Background

Jungle Lake is a 10-acre stormwater management pond within Walter Fuller Park in St. Petersburg Florida. The park is operated by the City of St. Petersburg (City) Department of Parks & Recreation, and the stormwater management system (i.e., the Lake and its inlets and outlet structure) are maintained by the City's Department of Stormwater and Operations. The Park is highly popular and reflects a growing community preference for passive (e.g., walking, birding) and active recreational choices (e.g., pickleball, swimming, tennis). The lake was excavated approximately 90 years ago to provide fill for local road projects and originally received stormwater from five inlets and discharged through an open channel 2.5 miles to Boca Ciega Bay. Recent water quality measurements indicate that nutrient concentrations in Jungle Lake water are greater than expected for a natural Florida lake in the west-central Florida region. As a stormwater management system, the lake is not removing nutrients in discharges to the bay to the extent expected for similar retention pond systems. The Jungle Terrace Civic Association (JTCA) has expressed concern over Jungle Lake performance and appearance to the City.

In response to a request from Dr. Ed Carlson, JTCA President, Stewards of Our Urban Lakes (SoUL) prepared an outline for a Restoration Plan (RP) for Jungle Lake (**Figure 1**). The RP outline described a four-year plan intended to significantly increase the areal coverage and water quality benefits of wetland plants within the lake. The revegetation project would be intended to optimize aquatic vegetative coverage through selective planting and managed natural colonization of available pond bottom. Work would be implemented through community-based volunteer activities under the guidance of SoUL.

To discuss key points of the RP and build a consensus on implementation, a meeting was held on February 28, 2023, with State of Florida District 69 Representative Linda Chaney at her St. Petersburg office. In attendance were City Councilman Copley Gerdes, City Lakes Manager Michael Perry, Dr. Ed Carlson, and SoUL President Jim Bays. The meeting confirmed City and Legislative interest and general support for the RP, and the City representatives committed to providing funding for an initial phase of lake restoration from available general funds. This memorandum provides a description, schedule, and budget for the implementation of the first phase of the restoration plan.

Figure 1. Jungle Lake Restoration Plan Conceptual Outline Memo (February 23, 2023)

February 23 2023

Subject: Jungle Lake Restoration - Conceptual Activity Description and Timeline

Prepared by: Jim Bays, President, SoUL Inc.

This memorandum summarizes a recommended Restoration Plan (RP) of Jungle Lake at Walter Fuller Park in St. Petersburg Florida. This RP is prepared in outline format and is based upon a brief review of available data but predicated on my cumulative long-term experience gained from 47 years as a wetland and lake consultant. Features and details of the RP are expected to change as information is gained.

1) Jungle Lake Features
   a) Pond Conversion:
      i) Serpentine flow pattern and increased shoreline installing peninsulas in early 1990s
   b) Wastewater Discharge:
      i) Wastewater overflows and accumulated sludge in mid-2010s
   c) Bottom Profile Alteration:
      i) Sludge removal modified shallow littoral zone extent and depth
   d) Significant Sediment Oxygen Demand and Water Lettuce Overgrowth
      i) Residual Effect of Wastewater Discharge and Lack of Native Vegetation Coverage
   e) Aeration System Installation:
      i) 14 aerators installed in 2020
   f) Recreational Features:
      i) Lake Perimeter Path and Multiple Overlooks
2) Restoration Objectives
   a) Reduce Nutrients in Discharge (N and P)
   b) Increase Wetland Vegetation Cover (Littoral, Floating-Leaved Vegetation, SAV)
   c) Create Sustainable Balanced Aquatic Ecosystem (Fish Community Metrics)
3) Restoration Plan in Phases:
   a) Phase 1 (Y1): Data and Pilots –Profiles, Aerator Oxygenation, Test Plots, FWI, Alum Application
   b) Phase 2 (Y1-2): Monitoring and Maintenance – Growth, Water Quality, Nutrients
   c) Phase 3 (Y2-5): Shoreline Revegetation and Maintenance
   d) Phase 4 (Y3): Sediment Inactivation – Alum or Sidestream Superoxygenation
4) Phase 1 Features
   a) Data Collection
      i) Depth and Flow Path Profiles for Nutrients and Oxygen
      ii) Diel Ecosystem Metabolism
      iii) Plant Species Inventory by Depth Range
   b) Pilot Projects
      i) Littoral Zone Revegetation Test Plot and Seed Bank Augmentation
      ii) FWI Demonstration Installation
      iii) Alum Application – In-situ "Limno-Corral"

Stewards of Our Urban Lakes, Inc.
A Florida/Federal 501 (c)(3) non-profit organization.

The RP proposes to address current water quality conditions within the lake through active and passive revegetation of the pond through selective plantings, facilitated passive plant colonization, and field monitoring. The work would be accomplished through organized community-based volunteer actions under the guidance of SoUL. Given the importance of allowing time for growth of wetland plants and the resulting regeneration of ecosystem functions appropriate for stormwater quality improvement, the RP would be phased, with a flexible approach to allow adjustments as new information is gained.

Current Jungle Lake Water Quality

The available water quality data collected in 2020-2021 as part of the Lakewatch program reflect the net effect of almost a century of stormwater management, recent sewage spills and a vigorous aquatic plant control program. Average discharge concentrations of total phosphorus (TP), total nitrogen (TN), and chlorophyll-a from Jungle Lake are 371 µg/L, 1,336 µg/L and 35 µg/L, respectively. Compared to concentrations measured in the inlet arms to the lake, removal efficiencies average 9%, 4% and 15%, respectively. While helpful, these reductions are significantly less than what may be expected, based upon the literature of treatment wetlands and available stormwater Best Management Practices (BMP) performance summaries. For example, the urban stormwater BMP database reports a TP reduction of 57% from median inflow and outflow TP values of 0.246 µg/L and 0.120 µg/L (BMP). Similarly, the BMP database reports a 26% reduction in TN from an inflow (1.63 mg/L) and outflow (1.20 mg/L). From these observations, it is reasonable to conclude that performance of Jungle Lake as a watershed BMP for Boca Ciega Bay can be improved.

Potential Causes for Performance Gaps

There are two likely explanations for the current poor performance of Jungle Lake. First, wetland vegetation within the water body is conspicuously lacking. Wetland vegetation provides a self-sustaining mechanism for organic matter production, nutrient assimilation and burial, enhanced sedimentation of suspended particles, and abundant submersed surface area for microbial biofilm development. Based upon recent field investigations in preparation for this proposal, it may be possible to vegetate approximately 25% of the total lake open water surface area with emergent macrophytes by restoring the original planting design from 1995. An additional 25% may be added to the coverage of wetland plant species by installation of FLAV and SAV species in relatively deeper depths (i.e., 3 feet).

Second, internal sediment loading is a likely source of nutrients to the lake water column, resulting in an adverse impact on water clarity, algal content, and nutrient concentration. Sequestering nutrients in the sediments, and more importantly, limiting their mobilization as soluble forms at the low-oxygen sediment-water interface, would lead to a long-term improvement in water quality. In 2020, a 14-unit aeration system was installed in the lake to improve lake oxygen content, but its ability to meet the lake's sediment oxygen demand warrants further evaluation.

Jungle Lake Water Quality and Habitat Improvement Project

In 1995, the Southwest Florida Water Management District provided funds for the City to subdivide the lake into four compartments to create a hydraulic configuration and additional wetland area more favorable to nutrient assimilation and increased vegetative cover. This surface water management project was intended to improve the quality of water discharging from the lake to Boca Ciega Bay. Wetland vegetation was installed, as per design, to a depth of -2 feet below the normal operating level. However, based upon original design drawings, maximum depths within the channels and open zones of the lake extend to 5 to 7 feet below water surface. This is beyond the inundation tolerance of emergent aquatic macrophytes (EAV), such as pickerelweed and bulrush, but within ranges known to occur for floating-leaved aquatic vegetation (FLAV) such as spatterdock and water lily and submersed aquatic vegetation (SAV) such as eelgrass and pondweed.

The depth of light penetration (i.e., the photic zone) is the critical factor in the distribution of FLAV and SAV. Light is required for germination and growth of the plants. Available water quality data collected from Jungle Lake in 2020-2021 indicate that Secchi transparency (a measure of light penetration) averaged 2.5 feet, corresponding to an approximate photic (uppermost layer of water that receives sunlight and where photosynthesis exceeds respiration) zone for the lake (i.e., twice the Secchi depth) that extends to -5 feet below water surface. Recent visits to the lake indicate that FLAV and SAV species are not present in the lake. This absence is likely attributable to recent herbicide applications to respond to excess growth of nuisance floating aquatic plants, including water lettuce, duckweed, alligator weed, and water primrose.

Northwest Regional Water Reclamation Facility Discharge

The City's Northwest Regional Water Reclamation Facility lies south of the lake and is upgradient in elevation from the lake. Stormwater from that portion of the lake's watershed is conveyed through a surface channel. Between 2016 and 2018, several sewage spills occurred at the Northwest Facility during storm event conditions, and the sewage flowed to Jungle Lake. These events led to a consent order with the Florida Department of Environmental Protection (FDEP) requiring the City to improve and upgrade plant treatment, storage, and disposal processes. These improvements are in the final stages of completion and are designed to prevent similar spills in the future. Improvements to the headworks, the installation of two new deep injection wells and two 7.5-million-gallon storage tanks have increased plant capacity and reliability. Future discharges from the Northwest Facility are considered unlikely.

Purpose

This memorandum describes the recommended approach for Phase 1 of the multi-year project. A preliminary schedule and budget are proposed commensurate with the expectation of funding available from the City and the JTCA.

General Approach

Overview

The objective of the project is to establish a consistently dense stand of wetland plant species across the entire lake. Increased wetland vegetation is expected to provide the following ecological functions helpful to the goal of reducing internal sediment loading:

- Reduced potential for shallow resuspension of sediments into the water column.
- Plant uptake of soluble nutrients and incorporation into biomass for long-term sediment burial in less available forms.
- Provision of biological substrate in the water column for periphyton attachment and associated nutrient uptake and retention.
- Increase in pH through natural diel (what is this?) photosynthesis to enhance mineral precipitation of phosphorus as a calcium compound.
- Competition with planktonic algae for nutrients and light.
- Enhanced oxygenation of the upper sediment layers to reduce mobilization of soluble nutrients.

Given the preponderance of relatively deep water (3 feet or greater), it is necessary to select species most appropriate to the site conditions. For this reason, Phase 1 of the RP is a year of testing to determine the most suitable combination of plants for future installation. Species will be selected from the following general categories of wetland plant species based upon growth form and depth tolerance:

- **Emergent aquatic vegetation (EAV).** Species of bulrush, duck-potato, and pickerelweed are commonly available wetland plants tolerant of a water depth of two feet.
- **Rooted floating aquatic vegetation (RFAV)**. Spatterdock, water lily and water lotus are common native Florida species found at depth ranges from 2 to 6 feet.
- **Submersed aquatic vegetation (SAV)**. Eelgrass, coontail, and pondweed are common pond plants that are adapted to depths from 2 to 6 feet or greater, depending upon light availability.

Additionally, the use of Floating Wetland Islands (FWI) could be investigated at Jungle Lake, given the relatively shallow pond depth. At Crescent Lake, FWIs were installed at the edge of the southern restored marsh to increase total wetland area. This growing technology uses an artificial buoyant mat made of recycled plastic and vegetated with native plant species to establish a floating root mat suspended in the water column for nutrient assimilation and aquatic habitat. Placement of FWIs in proximity to the aeration diffusers would create an aerobic substrate for microbial oxidation of reduced nitrogen forms and enhanced settling of suspended particles. The FWIs could be configured as individual units or connected to create a more extended floating wetland. To enhance the proportion of total flow through the root mat, turbidity curtains could be installed to direct water through the FWI root zone and the adjacent marshes.

Other methods are available for inactivation of internal nutrient loading, including application of buffered alum compounds, or the injection of pure oxygen in a recycled sidestream. General experience with alum application in Florida has led to the conclusion that improvements are apparent for approximately a decade, after which an additional application becomes necessary. And the use of the oxygen injection incurs a continuing maintenance cost. Both approaches should remain under consideration for Jungle Lake, and investigations into each are recommended for subsequent phases of the project when greater funding may become available. However, the presence of an enhanced, dense, and depth-appropriate stand of wetland plants offers the best long-term benefit of sustained performance with minimal maintenance oversight, if feasible to establish within the lake.

Proposed Study Locations

Figure 2 shows the locations of monitoring stations, by type (i.e., vegetative growth, water quality, and FWI), as described further in the text below.

Plant Suitability and Growth Assessment

Plant suitability and growth rates are proposed to be tested by installing a variety of native Florida plant species adapted to prevailing water depth within the lake. A total of ten test plots are proposed to be installed adjacent to the dividing berms (**Figure 2**). Each test plot will consist of paired rectangles oriented parallel to the dividing berm (**Figure 3**). The plot adjacent to the berm will encompass a depth range of 1 to 2 feet. The deep-water plot will cover a range of 2 to 3 feet. Based upon preliminary measurements, the shallow plot will be offset from the water's edge by 10 feet, but this is approximate, given the variation in depth contours. Plants will be installed more densely in the shallow plot (3-foot center) and less so in the deeper plot (5-foot center).

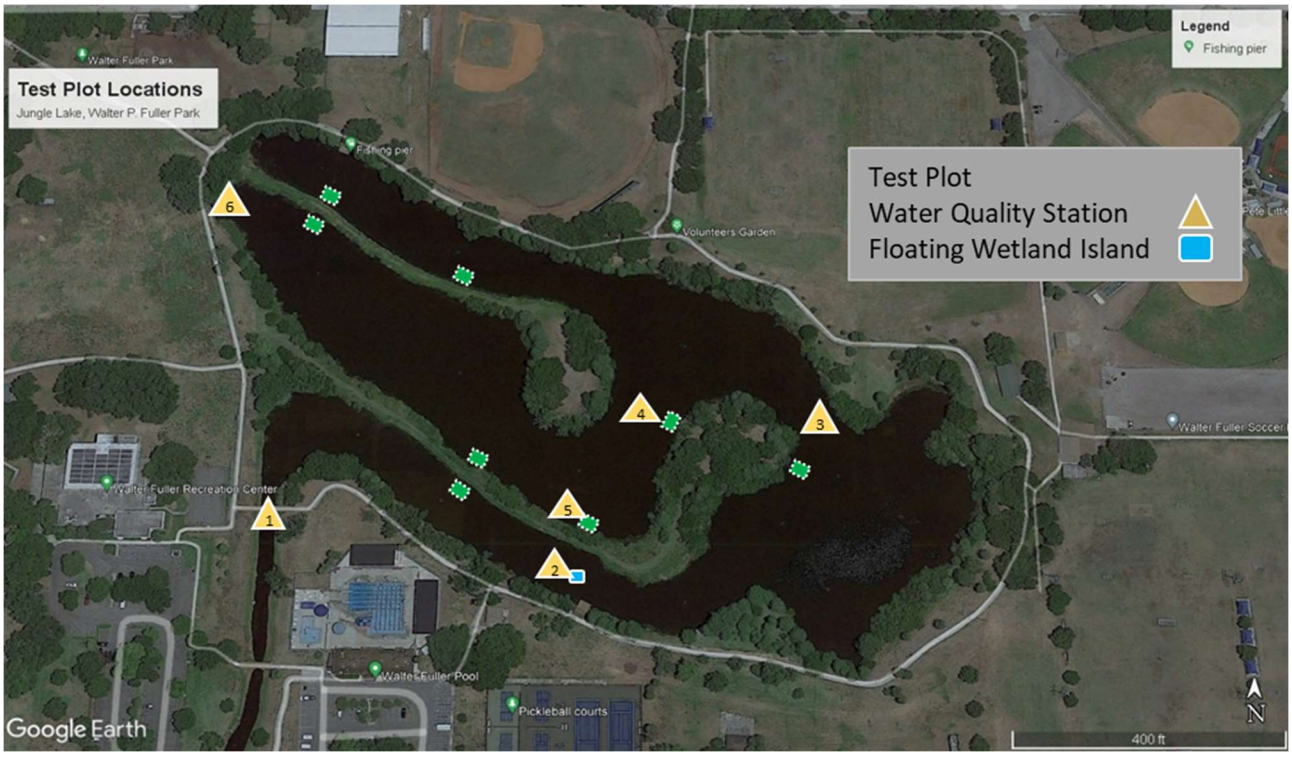

Figure 2. Proposed Study Locations by Type, Jungle Lake, Walter P. Fuller Park.

Table 1 summarizes the plant species quantities by zone and by plot. Nine plots will compare the growth of the different deep-water species in a 3x3 statistical design. A tenth plot will be a demonstration of planting all species at a greater density, with the objective of accelerating plant growth and coverage of deep-water species. Species considered in this list based upon preliminary contact with commercial plant suppliers include pickerelweed (PW), duck-potato (DP), softstem bulrush (SB), giant bulrush (GB), water lily (WL), spatterdock (SP) and eelgrass (EG).

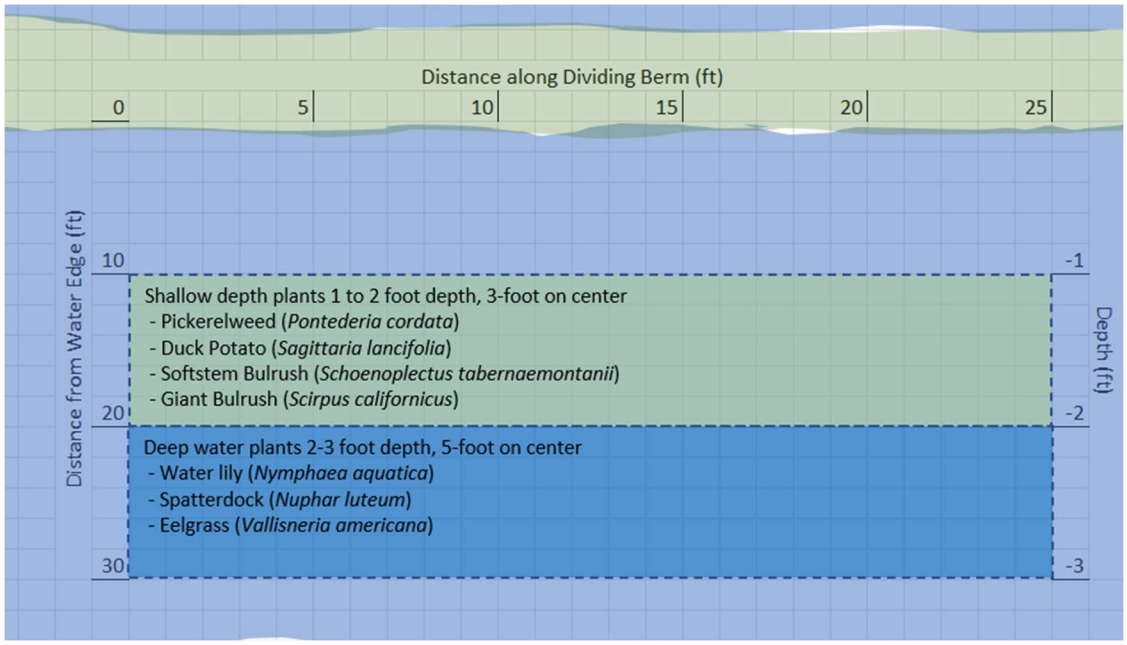

Figure 3. Typical Test Plot Configuration and Species List.

The total number of plots, species and individual plants is intended to hasten the growth of vegetation within the lake by creating multiple in-lake nurseries for each species. Each plot is expected to become a source of seeds, root mats, rhizomes or other propagules that will be distributed passively throughout the lake over time.

In preparation for planting, test plot corners will be marked with PVC pipes which will be marked clearly with “No Spray or Mow” signage. Following plant installation in May, changes in plant cover will be monitored by SoUL interns with quality assurance review by senior SoUL staff on a bimonthly basis. The plots will be maintained by manual removal of invasive plants during bimonthly volunteer events organized by SoUL with assistance from Keep Pinellas Beautiful (KPB). Based on prior experience, the remainder of 2023 will likely be required to confirm growth and survival of the plants in all plots.

The availability of deep-water species will require special attention in the preparation and execution of the project. Currently, water lilies are available with advance notice from Aquatic Plants of Florida and eelgrass is available from commercial aquarium supply companies but will require special planting units (e.g., burlap planting bags) for installation. These will be made by volunteers during the initial volunteer event. Spatterdock is not commercially available based on preliminary investigations so will be transplanted from local sources, such as Booker Lake or Crescent Lake in St. Petersburg.

Table 1. Estimated Plant Species Quantities.

		Species							
Plot	**Depth**	**PW**	**DP**	**SB**	**GB**	**WL**	**SP**	**EG**	**Total**
1	Shallow	9	9	9	9	0	0	0	36
	Deep	0	0	0	0	14	0	0	14
2	Shallow	9	9	9	9	0	0	0	36
	Deep	0	0	0	0	0	14	0	14
3	Shallow	9	9	9	9	0	0	0	36
	Deep	0	0	0	0	0	0	14	14
4	Shallow	9	9	9	9	0	0	0	36
	Deep	0	0	0	0	14	0	0	14
5	Shallow	9	9	9	9	0	0	0	36
	Deep	0	0	0	0	0	14	0	14
6	Shallow	9	9	9	9	0	0	0	36
	Deep	0	0	0	0	0	0	14	14
7	Shallow	9	9	9	9	0	0	0	36
	Deep	0	0	0	0	14	0	0	14
8	Shallow	9	9	9	9	0	0	0	36
	Deep	0	0	0	0	0	14	0	14
9	Shallow	9	9	9	9	0	0	0	36
	Deep	0	0	0	0	0	0	14	14
10	Shallow	9	9	9	9	0	0	0	36
	Deep	0	0	0	0	14	14	14	42
	Test Plot Total	90	90	90	90	56	56	56	528
	Floating Wetland Island	10	10	10	10	0	0	0	40
	Grand Total	100	100	100	100	56	56	56	568

Water Quality Performance

Concurrent with the test plot investigation, the Lakewatch water quality analysis program will be reinitiated as a basis for comparison with prior water quality data. Under direction of senior SoUL staff, samples will be collected by a SoUL intern and a volunteer at six stations during each bimonthly maintenance event. **Table 2** summarizes the water quality station locations and purpose. Stations 2 and 5 are intended to be taken from the center of the test plots to be compared to the other stations over time to assess the effect of vegetation on littoral water quality.

Table 2. Water Quality Station Locations.

ID	Location
1	South Inlet Channel by Bridge
2	Test Plot adjacent to South Berm on South Inlet Channel
3	South Inlet and Central Pool Intersection
4	North Inlet and Central Pool Intersection
5	Test Plot adjacent to South Berm on Outlet Channel
6	Outflow Weir

Following installation of the test plots, depth profile measurements will be made at each plot of field parameters (dissolved oxygen, temperature, pH, and specific conductivity). The multimeter will be installed for recording diel variation in the field parameters. This will be conducted twice during the project (July and December 2023) to assess seasonality in profile and ecosystem productivity.

Floating Wetland Island

A demonstration FWI is proposed to be installed between an existing aerator and the recreational overlook on the South Inlet arm (**Figure 2**). The FWI would be prepared and launched from the South dividing berm. Maintenance would be performed during the bimonthly events from canoe by volunteers under SoUL staff supervision. The FWI would be cabled to a pair of Earth Anchors, which would be installed in the center of the channel.

Schedule

Figure 4 presents a preliminary schedule for the implementation of the first phase of the Jungle Lake RP during Year 1. The bulk of the project planting activity is conducted in the spring of 2023 to expedite plant growth under optimal summer conditions. Monitoring and maintenance of coverage will be led by SoUL staff but will be assisted by volunteers to be organized and implemented through project partners Keep Pinellas Beautiful (KPB).

Data will be summarized monthly and provided to the City, JTCA, KPB and other interested parties in a letter format. A final data summary report will be prepared in December as a final overview of the results and will include recommendations for subsequent project phases.

Figure 4. Preliminary Schedule.

Activity	2023 A	M	J	J	A	S	O	N	D
Test Plots									
Setup									
Planting									
Monitoring									
Floating Wetland Islands									
Procurement									
Installation									
Monitoring									
Monitoring & Maintenance									
Vegetation									
Lakewatch									
Depth Profiles									
Continuous Data									
KPB Boat Support									
Canoes & Staff									

Budget Estimate

Table 2 summarizes the preliminary cost estimate for the supplies and SoUL intern support for the first phase of the project. The cost for Phase 1 totals **$8,988.701**.

Cost categories include:

- Labor cost for SoUL senior staff.
- Materials to demarcate Test Plot location and boundaries.
- All aquatic plants, based upon the preliminary planting list provided in **Table 1** and using current pricing provided by suppliers.
- Planting supplies such as burlap bags and soil ballast for installation of water lily and eelgrass.
- One Biohaven Type Floating Wetland Island (6.5 ft b 6 ft) from Martin Ecosystems.
- Island installation supplies including Earth Anchors, cables, and connections.
- SoUL intern costs to set up the plots, lead volunteers in planting of the plots, conduct monitoring and maintenance, and develop summary data reports.
- Keep Pinellas Beautiful administrative costs to provide volunteer coordination, field equipment, canoes on a quarterly basis, work gloves, and related field supplies.
- Miscellaneous field supplies, such as potable beverages for volunteers and replacement tools or plot materials, as needed.
- Cost to transport plants from commercial nurseries, including van rental and fuel.

Future grant proposal submittals to the Tampa Bay Estuary Program and the Tampa Bay Ecosystem Restoration Fund allow these initial phase costs to be shown as “match” funding.

Table 2. Preliminary Cost Estimate, Jungle Lake Restoration Plan, Phase 1.

Task	Materials	Quantity	Unit Cost	Subtotal
1. Test Plot				
Materials	PVC Posts (1 in x 10 ft)	30	$ 8.06	$ 241.80
	Plants	528	$ 1.32	$ 696.96
	Burlap for Planting	2	$ 15.98	$ 31.96
	Twine for Planting	1	$ 5.98	$ 5.98
	Staples	2	$ 23.95	$ 47.90
	Signs	1	$ 50.00	$ 50.00
	Misc Supplies	1	$ 50.00	$ 50.00
	Plant Transport	1	$200.00	$ 200.00
				$1,324.60
	Sales Tax		7%	$ 92.72
	Subtotal			$1,417.32
Labor	Senior Staff	12	$ 50.00	$ 600.00
	Interns	13	$ 11.00	$ 143.00
	Subtotal			$ 743.00
Administrative	SoUL		5%	$ 70.87
	Subtotal			$ 70.87
	Total			$2,231.19
2. Floating Wetland Island				
Materials	Biohaven (6.5 ft x 6.0 ft)	1	$965.00	$ 965.00
	Shipping	1	$320.00	$ 320.00
	Earth Anchors	2	$ 25.00	$ 50.00
	Cables & Supplies	1	$ 50.00	$ 50.00
	Plants	40	$ 1.00	$ 40.00
	Plant Transport	1	$ 65.00	$ 65.00
				$1,490.00
			7%	$ 104.30
	Subtotal			$1,594.30
Labor	Senior Staff	7	$ 50.00	$ 350.00
	Interns	6	$ 11.00	$ 66.00
	Subtotal			$ 416.00
Administrative	SoUL		5%	$ 79.72
	KPB (1 monthly event)	1	$250.00	$ 250.00
	Subtotal			$ 329.72
	Total			$2,340.02
3. Monitoring and Maintenance				
Materials	Multimeter Rental (Weekly)	2	$150.00	$ 300.00
	Multimeter Shipping	2	$ 50.00	$ 100.00
	Misc Supplies	1	$150.00	$ 150.00
	Subtotal			$ 550.00
Labor	Senior Staff	16	$ 50.00	$ 800.00
	Interns	16	$ 11.00	$ 176.00
	Subtotal			$ 976.00
Administrative	SoUL		5%	$ 27.50
	KPB (4 monthly events)	4	$250.00	$1,000.00
	Subtotal			$1,027.50
	Total			$2,153.50
4. Reporting and Educational Outreach				
Materials	Misc Supplies	1	$150.00	$ 150.00
	Subtotal			$ 150.00
Labor	Senior Staff	24	$ 50.00	$1,200.00
	Interns	24	$ 11.00	$ 264.00
	Subtotal			$1,464.00
Administrative	SoUL		5%	$ 7.50
	KPB (1 monthly event)	1	$250.00	$ 250.00
	Subtotal			$ 250.00
	Total			$1,714.00
Grand Total				
	Materials			$3,711.62
	SoUL Labor			$3,599.00
	Administrative			$1,678.08
	Total			$8,988.70

Partnerships

To perform Phase 1 of the Jungle Lake Restoration Plan - Year 1, SoUL will partner with Keep Pinellas Beautiful, the City of St. Petersburg Departments of Parks & Recreation and Stormwater, Pavement and Traffic Operations, and the Jungle Terrace Civic Association. The role of each partner is summarized as follows:

- **Keep Pinellas Beautiful (KPB).** KPB will assist by advertising volunteer activity opportunities on social media platforms and by providing canoes, field staff and equipment for initial planting and four follow-up maintenance events.
- **City of St. Petersburg Parks & Recreation Department.** The City Parks & Recreation Department will assist by maintaining access to the test plots through routine mowing and site maintenance, and by disposing of debris and invasive plants removed during lake maintenance.
- **City of St. Petersburg Stormwater, Pavement and Traffic Operations Department.** The City Stormwater, Pavement and Traffic Operations Department will assist by collaborating on lake maintenance activities to prevent impacts to the test plots, as well as providing mechanical weed removal assistance and/or controlled herbicide application as requested and under the direction of SoUL staff.
- **Jungle Terrace Civic Association.** The Jungle Terrace Civic Association will assist with funding and related administrative services, local outreach to help introduce the project to neighborhood residents, assist with advertising cleanup and maintenance campaigns, to build and maintain contacts with local schools and to help maintain overall communications.

Educational Outreach

The proximity of Jungle Lake to the Azalea Middle School offers an opportunity for educational field trips to the park and for engagement by middle school students with initial plantings and periodic maintenance. As the project proceeds, KPB will establish a rapport with the school and organize field trips and site activities, including classroom lectures and field exercises on the features of the project supported by SoUL. The concept of having the students “adopt” a test plot and study their changes over time would seem to offer many opportunities for scientific and technical learning. As KPB has done with SoUL at Crescent Lake (e.g., Shorecrest Elementary, Shorecrest High School), we propose to develop an interesting, field-oriented approach to learning about freshwater ecosystems to share with local educators and their communities.