Bowlees Creek Stream Assessment

Study Area

Bowlees Creek flows into Sarasota Bay in Manatee County and was assessed on August 6, 2014. The watershed of Bowlees Creek is urbanized, containing residential (40.14%), industrial (16.92%), transportation (14.3%) and commercial (11.6%) land uses, resulting in a drainage basin Landscape Development Intensity (LDI) value of 32.5. Bowlees Creek flows through a golf course where there is a water level weir limiting the influence of saltwater in the upstream extents. Below the weir, Bowlees Creek has been heavily fortified by seawalls with few areas of natural vegetation in the lower reaches.

Figure 1. Overview of the Bowlees Creek Study Area

Vegetation Survey

The Bowlees Creek vegetation assessment encompassed seventeen vegetation regions from the mouth in Sarasota Bay as shown in Figure 2. In these regions, 41 species of vegetation were identified. Regions 1 through 7 were dominated by mangroves (*Rhizophora mangle, Laguncularia racemosa* and *Avicennia geminans*) with few other salt tolerant species present. Upstream from Region 7, Brazilian Pepper, s*chinus terebinthifolius,* became more common. The most upstream mangrove was *Laguncularia racemosa* was in Region 17. The first occurrence of Leather Fern (*Acrostichum danaeifolium*) was in Region 13 and Needle Rush (*Juncus roemerianus*) was first observed in Region 11.

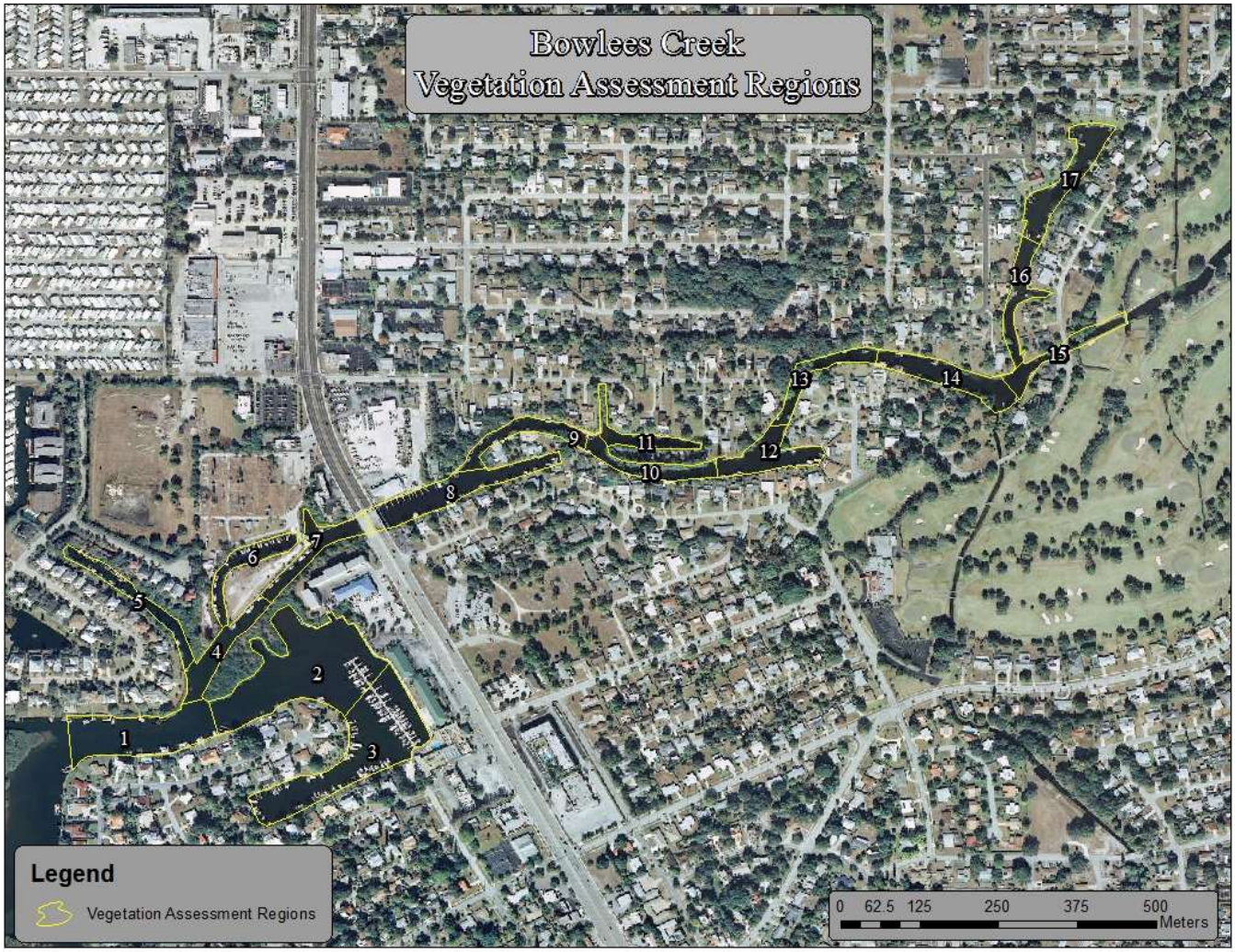

Figure 2. Overview of Bowlees Creek Vegetation Assessment Regions

Figure 3 shows the vegetation transition zone of Bowlees Creek indicating the most downstream Leather Fern in Region 13 as well as the most downstream Needle Rush, *(Juncus roemerianus)*, in Region 11. Based on the vegetation assessment data for Bowlees Creek, Regions 1 through 9 would comprise the highest salinity and tidal influence zone, Region 10 through 17 would comprise the "mixing" zone. The freshwater dominant zone would be above the weir at the golf course above Region 15. Regions 11, 16 and 17 are isolated from the main flow of Bowlees Creek. These regions have varying salinity values compared to the trend of the main channel. Several stormwater outfalls are located on Bowlees Creek and a large amount of floating litter was located downstream from U.S. Highway 41. The vegetation assessment species lists are shown in Table 1.

Figure 3. Bowlees Creek Vegetation Waypoints

Table 1. Bowlees Creek Vegetation Assessment List

Plant Species	Common Name	Sample Region																	Regions Found
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Laguncularia racemosa	White Mangrove	1	1		1	1	1	1	1	1	1	1		1	1	1	1	1	15
Schinus terebinthifolius	Brazilian Pepper		1		1	1	1	1	1	1		1	1	1	1		1	1	13
Rhizophora mangle	Red Mangrove	1	1	1	1	1	1	1	1	1	1	1							11
Casuarina equisetifolia	Australian Pine		1		1	1					1	1		1				1	7
Coccoloba uvifera	Seagrape		1		1	1		1		1			1	1					7
Quercus geminata	Sand Live Oak		1				1	1			1			1	1			1	7
Avicennia germinans	Black Mangrove	1	1		1	1	1	1											6
Baccharis halimifolia	Eastern False Willow, Saltbush				1			1						1			1	1	5
Conocarpus erecta	Buttonwood		1		1	1	1	1											5
Parthenocissus quinquefolia	Woodbine	1			1	1				1				1					5
Sabal palmetto	Sabal Palm					1	1	1							1		1		5
Sphagneticola (Wedelia) trilobata	Creeping Oxeye						1			1		1		1				1	5
Alternanthera philoxeroides	Alligator Weed												1			1	1	1	4
Bacopa monnieri	Common Bacopa, Herb-Of-Grace				1			1								1		1	4
Cupaniopsis anacardioides	Carrotwood				1						1	1						1	4
Ficus benghalensis	Banyan Tree					1			1	1		1							4
Blutaparon vermiculare	Silverhead, Saltweed															1	1	1	3
Panicum repens	Torpedo Grass									1					1		1		3
Sansevieria hyacinthoides	Bowstring Hemp										1	1	1						3
Ambrosia artemisiifolia	Common Ragweed							1						1					2
Cenchrus sp.	Sandspur						1	1											2
Melaleuca quinquenervia	Punk Tree, Melaleuca													1	1				2
Quercus laurifolia	Laurel oak					1		1											2
Solidago sempervirens	Goldenrod									1			1						2
Vitis rotundifolia	Muscadine Grape							1						1					2
Acrostichum danaeifolium	Leather Fern													1					1
Cinnamomum camphora	Camphor-tree													1					1
Cyperus odoratus	Fragrant Flatsedge															1			1
Diodia virginiana	Buttonweed															1			1
Distichlis spicata	Salt Grass						1												1
Echinochloa walteri	Coast Cockspur Grass (hairy)																1		1
Halodule wrightii	Shoal-grass	1																	1
Iva frutescens	Marsh Elder						1												1
Juncus roemerianus	Needle Rush, Black Rush											1							1
Juniperus virginiana	Red Cedar						1												1
Leucaena leucocephala	White leadtree							1											1
Myrica cerifera	Wax Myrtle							1											1
Panicum maximum	Guneagrass													1					1
Salicornia sp.	Glasswort						1												1
Scirpus californicus	Soft-Stem Bulrush														1				1
Taxodium ascendens	Pond Cypress					1													1

Habitat Assessment

Collected sonar data were processed through Dr. Depth software to analyze the strength of the return signal from the bottom to get an estimate of the relative bottom hardness for Bowlees Creek. Figure 4 shows the bottom hardness raster for Bowlees Creek. In this raster, the higher the hardness value, the harder the bottom substrate. This map is meant to help identify locations of harder and softer bottoms for benthic invertebrate sampling, fish sampling and benthic chlorophyll sampling.

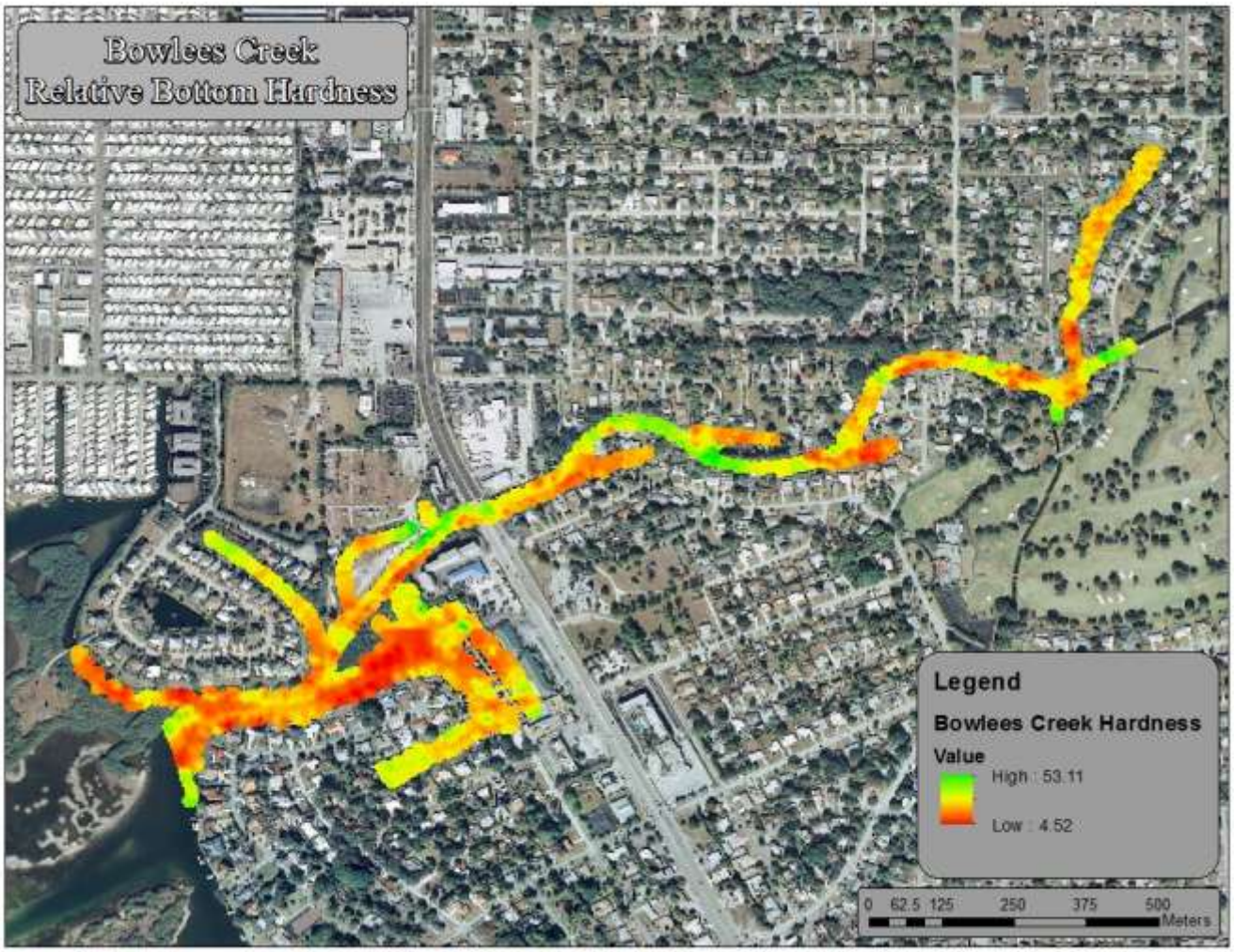

Figure 4. Bowlees Creek Relative Bottom Hardness Map

Bathymetry Mapping

In the study area, Bowlees Creek had a mean depth of 4.24 feet and a maximum depth of 7.64 feet. A total of 33.02 acres of creek was mapped during the assessment. At the time of assessment, Bowlees Creek contained an estimated 39,703,926 gallons of water in the study area. The water level elevation of Bowlees Creek at the time of the assessment was not available. Figure 5 details the bathymetric mapping for Bowlees Creek showing the three depth strata.

Figure 5. Bowlees Creek Bathymetric Stratum Map