

Phillippi Creek Stream Assessment

Study Area

Phillippi Creek is located within a highly urbanized watershed. The majority of Phillippi Creek’s watershed has a land use of either residential or commercial resulting in a watershed LDI value of 6.3. The banks of the creek are sloping and the majority of the creek is not seawalled. Phillippi Creek becomes wider and deeper as you move downstream and is navigable for over 1.5 miles from Roberts Bay. This creek has the highest buffer LDI value of all the creeks in the study at 6.9 and has little natural or undisturbed habitat adjacent to the creek except at the mouth.

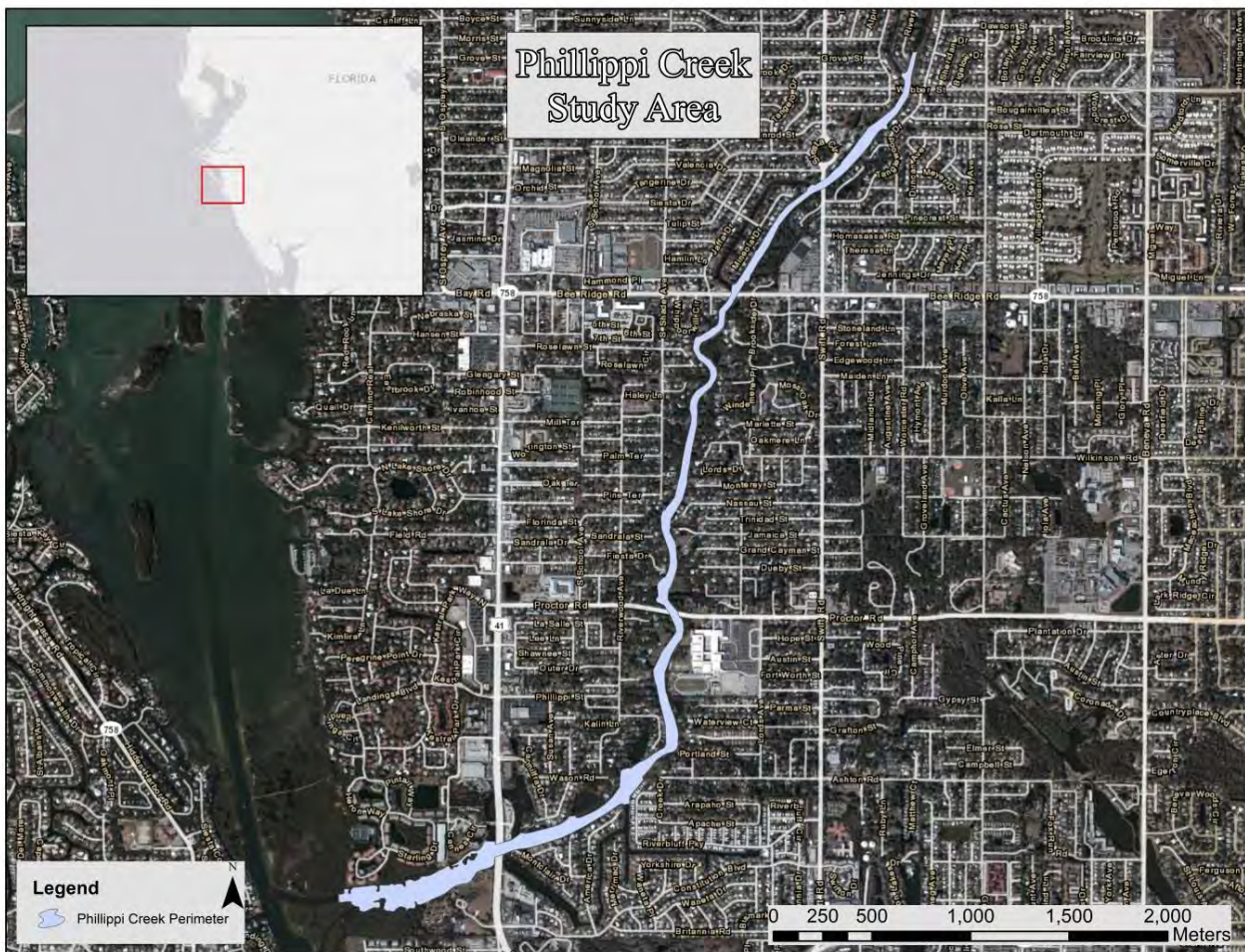


Figure 41. Overview of the Phillippi Creek Study Area

Vegetation Survey

The Phillippi Creek vegetation assessment encompassed 28 vegetation regions from the mouth in Roberts Bay to above Webber Street as shown in Figure 42. In these regions, 82 species of vegetation were identified. Regions 1 through 20 were dominated by mangroves (*Rhizophora mangle*, *Laguncularia racemosa* and *Avicennia germinans*) with few other salt tolerant species present. The most upstream mangrove was *Laguncularia racemosa* in Region 26. The first occurrence of Leather Fern (*Acrostichum danaeifolium*) was in Region 11, becoming co-dominant in regions 24 and 26. Needle Rush (*Juncus roemerianus*) was first observed in Region 7 with the last occurrence in Region 17. Above Region 21 the vegetation communities are populated by many species indicative of dominating freshwater influence.



Figure 42. Overview of Phillippi Creek Vegetation Assessment Regions

Figure 43 shows the vegetation transition zone of Phillippi Creek indicating the most upstream Black Mangrove as well as the most downstream Leather Fern and *Spartina*. Based on the vegetation assessment data for Phillippi Creek, regions 1 through 16 would comprise the highest salinity and tidal influence zone, regions 17 through 22 would comprise the “mixing” zone and regions 23 through 28 would comprise the freshwater dominant zone. The vegetation assessment species lists are shown in Table 10 through Table 12.



Figure 43. Phillippi Creek Vegetation Waypoints

Table 10. Phillippi Creek Vegetation Assessment List (Part 1)

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	18	19	20	21	22	23	24	25	26	27	28	
<i>Schinus terebinthifolius</i>	Brazilian Pepper			1	1	1	1	1	1	1	1	C	C	1	C	1	1	1	C	C	C	C	C	C	C	C	1	1	1	26
<i>Eichhornia crassipes</i>	Water Hyacinth	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1			1	1	1	1	1	1	1	25	
<i>Laguncularia racemosa</i>	White Mangrove	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	1	1		1		1		24	
<i>Quercus virginiana</i>	Virginia Live Oak				C	1	1	1	C	1	1	1	C	C	1	C	C	C	1	1	1	C	C	C	1	1	1	1	25	
<i>Alternanthera philoxeroides</i>	Alligator Weed			1	1	1		1	1	1			1	1	1	1	1		1	1		1	1	1	1	1	1	1	21	
<i>Sphagneticola (Wedelia) trilobata</i>	Creeping Oxeye				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1		1	1	1	21	
<i>Colocasia esculenta</i>	Wild Taro, Dasheen, Coco Yam			1		1	1	1	1	1	1	1	1	1	1	1	1		1	1				1	1	1	1	1	20	
<i>Rhizophora mangle</i>	Red Mangrove	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	1								20	
<i>Acrostichum danaeifolium</i>	Leather Fern											1	1	1	1	1	1	1	1	1	1	1	1	1	C	1	C	1	18	
<i>Vitis rotundifolia</i>	Muscadine Grape			1	1							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	
<i>Avicennia germinans</i>	Black Mangrove	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1												15	
<i>Cupaniopsis anacardioides</i>	Carrotwood									1			1		1	1	1	1			1	1	1	1	1	1	1	1	14	
<i>Iva frutescens</i>	Marsh Elder					1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1								14	
<i>Sabal palmetto</i>	Sabal Palm		1	1	1	1	1	1	1	1	1	1	1								1		1		1				14	
<i>Baccharis halimifolia</i>	Eastern False Willow, Saltbush			1	1		1						1		1					1	1		1		1	1	C	1	12	
<i>Crinum americanum</i>	Swamp lily														1		1	1	1	1	1	1	1	1	1	C	1	1	12	
<i>Dioscorea bulbifera</i>	Air Potato			1										1	1				1	1		1	1	1	1	1	1	1	12	
<i>Panicum repens</i>	Torpedo Grass							1								1	1	1	1		1	1	1	1	1	1	1	1	11	
<i>Myriophyllum aquaticum</i>	Parrot Feather							1	1				1	1	1	1	1			1		1	1	1		1	1	1	10	
<i>Spartina alterniflora</i>	Salt Marsh Grass							1	1	1			1	1	1	1	1	1	1	1	1								10	
<i>Coccoloba uvifera</i>	Seagrape				1	1	1		1	1									1	1			1	1					9	
<i>Enterolobium contortisiliquum</i>	Earpod Tree									1	1							1	1		1	1	1			1		1	9	
<i>Parthenocissus quinquefolia</i>	Woodbine				1	1			1				1								1		1	1	1	1	1	1	9	
<i>Bacopa monnieri</i>	Common Bacopa, Herb-Of-Grace															1			1				1	1	1	1	1	1	8	
<i>Dalbergia ecastaphyllum</i>	Coin Vine			1	1	1		1			1		1	1	1					1									8	
<i>Juncus roemerianus</i>	Needle Rush, Black Rush						1			1		1	1	1	1	1	1	1											8	
<i>Typha spp.</i>	Cattails												1	1			1									1	C	D	8	
<i>Amaranthus australis</i>	Southern Aramanth														1						1				1		1	1	6	
<i>Syngonium podophyllum</i>	Nephtis, American Evergreen															1						1	1	1			1	1	6	
<i>Casuarina equisetifolia</i>	Australian Pine										1			1	1	1						1							5	
<i>Cyperus involucratus</i>	Umbrella flat sedge																			1		1	1				1		5	
<i>Distichlis spicata</i>	Salt Grass					1	1	1													1	1							5	
<i>Juniperus virginiana</i>	Red Cedar			1	1			1																		1	1		5	

Table 11. Phillippi Creek Vegetation Assessment List (Part 2)

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	18	19	20	21	22	23	24	25	26	27	28		
<i>Melaleuca quinquenervia</i>	Punk Tree, Melaleuca													1	1											1	1	1			5
<i>Pluchea rosea</i>	Rosy Camphorweed														1	1										1			1	1	5
<i>Abrus precatorius</i>	Rosary Pea										1														1	1		1			4
<i>Bambusa spp.</i>	Bamboo																		1					1				1		1	4
<i>Blutaparon vermiculare</i>	Silverhead, Saltweed														1		1	1										1			4
<i>Koelreuteria elegans</i>	Golden Rain Tree									1	1					1												1			4
<i>Melia azedarach</i>	Chinaberry Tree																				1	1			1			1			4
<i>Phyla nodiflora</i>	Frog-fruit, Carpetweed, Turkey Tangle Fogfruit																1			1					1				1		4
<i>Schoenoplectus tabernaemontani</i>	Softstem Bulrush																						1				1	1	1		4
<i>Urochloa mutica</i>	Para Grass																						1			1		1	1		4
<i>Borrhichia frutescens</i>	Sea Oxeye				1	1				1																					3
<i>Carya aquatica</i>	Water Hickory																								1	1	1				3
<i>Eupatorium capillifolium</i>	Dog Fennel																						1				1	1			3
<i>Ludwigia repens</i>	Creeping Primrosewillow, Red Ludwigia											1		1					1												3
<i>Ludwigia polypoides</i>	Water Primroses, Primrosewillow												1							1	1										3
<i>Taxodium ascendens</i>	Pond Cypress																					1							1	1	3
<i>Ampelopsis arborea</i>	Peppervine																											1		1	2
<i>Bauhinia variegata</i>	Orchid Tree																											1	1		2
<i>Cinnamomum camphora</i>	Camphor-tree																				1	1									2
<i>Ficus aurea</i>	Strangler Fig																				1							1			2
<i>Hydrilla verticillata</i>	Hydrilla, water thyme																											1	1		2
<i>Leucaena leucocephala</i>	White leadtree																							1	1						2
<i>Mikania scandens</i>	Climbing Hempvine																								1				1		2
<i>Quercus geminata</i>	Sand Live Oak																					1	1								2
<i>Quercus laurifolia</i>	Laurel oak																					1			1						2
<i>Quercus nigra</i>	Water Oak																	1						1							2
<i>Ricinus communis</i>	Castorbean																								1				1		2
<i>Syzygium cumini</i>	Java Plum							1			1																				2
<i>Aeschynomene indica</i>	Indian Joint Vetch				1																										1

Table 12. Phillippi Creek Vegetation Assessment List (Part 3)

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	18	19	20	21	22	23	24	25	26	27	28	
<i>Bidens alba</i>	White Beggar Ticks						1																							1
<i>Commelina diffusa</i>	Dayflower																												1	1
<i>Hydrocotyl umbellata</i>	Manyflower Marshpennywort, Water Pennywort																												1	1
<i>Ludwigia peruviana</i>	Peruvian Primrosewillow																												1	1
<i>Musa spp.</i>	Banana Tree						1																							1
<i>Myrica cerifera</i>	Wax Myrtle																												1	1
<i>Nephrolepis spp.</i>	Sword Fern																						1							1
<i>Grevillea robusta</i>	Silk Oak										1																			1
<i>Paederia foetida</i>	Skunk Vine																					1								1
<i>Paspalum repens</i>	Water Paspalum																									1				1
<i>Pistia stratoides</i>	Water Lettuce																												1	1
<i>Polygonum hydropiperoides</i>	Swamp Smartweed																												1	1
<i>Ruellia simplex</i>	Britton's Wild Petunia																												1	1
<i>Rumex verticillatus</i>	Swamp Dock																												1	1
<i>Sambucus canadensis</i>	Elderberry																												1	1
<i>Sapium sebiferum</i>	Popcorn Tree, Chinese Tallow Tree															1														1
<i>Senna spp</i>	Senna																						1							1
<i>Serenoa repens</i>	Saw palmetto																	1												1
<i>Sesbania herbacea</i>	Danglepod Sesban																												1	1
<i>Spartina bakerii</i>	Cordgrass																					1								1

Habitat Assessment

Collected sonar data was 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 Phillippi Creek. Figure 44 shows the bottom hardness raster for Phillippi Creek. This map is meant to help identify locations of harder and softer bottoms for benthic invertebrate sampling, fish sampling and benthic chlorophyll sampling.

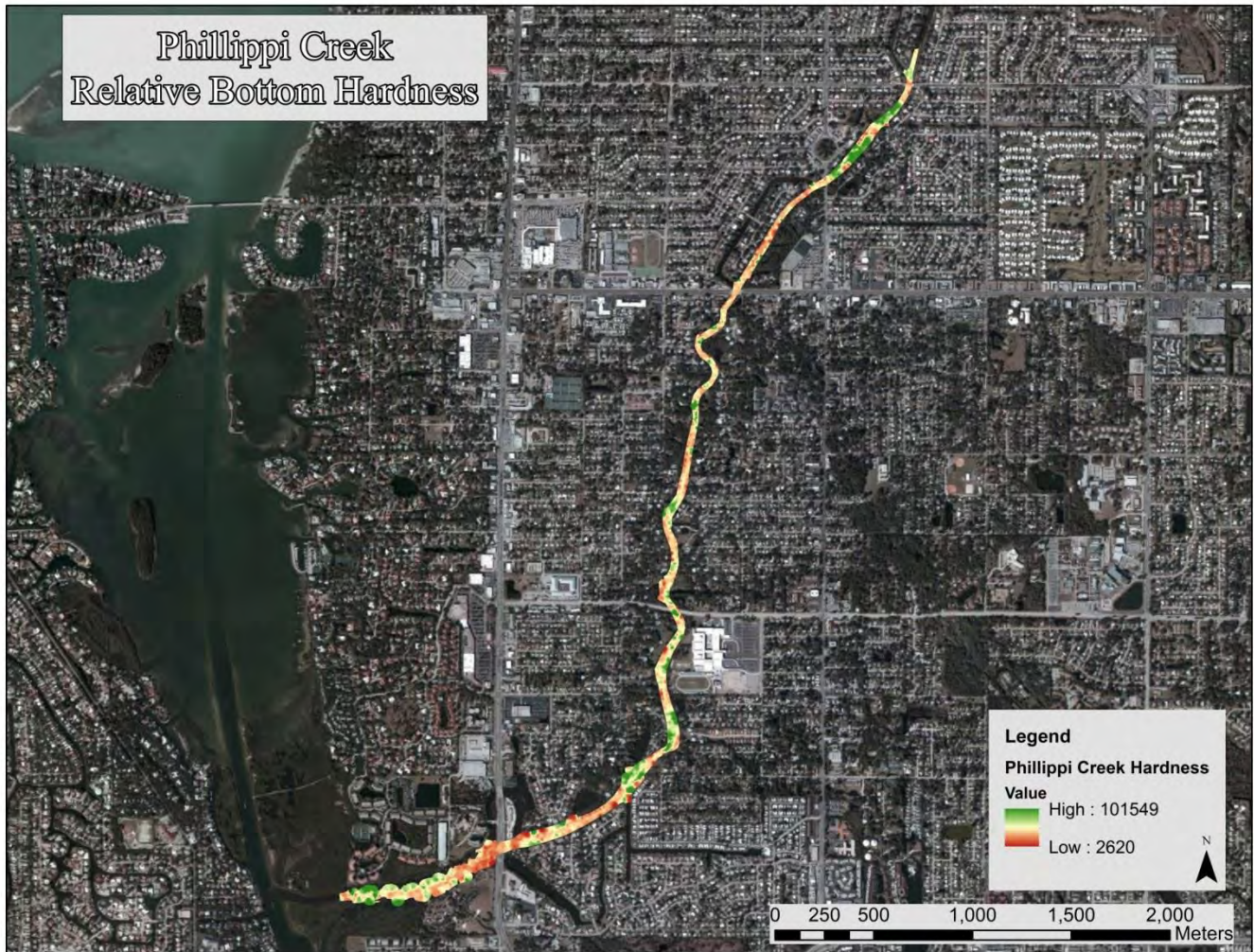


Figure 44. Phillippi Creek Relative Bottom Hardness Map

Bathymetry Mapping

In the study area, Phillippi Creek had a mean depth of 3.50 feet and a maximum depth of 11.75 feet. A total of 78.62 acres of creek was mapped during the assessment. At the time of assessment, Phillippi Creek contained an estimated 62,075,018 gallons of water in the study area. Figure 45 and Figure 46 detail the bathymetric mapping for Phillippi Creek showing the three depth stratum.



Figure 45. Phillippi Creek Bathymetric Stratum Map (1 of 2)



Figure 46. Phillippi Creek Bathymetric Stratum Map (2 of 2)