

Frog Creek Stream Assessment

Study Area

Frog Creek is located in the Lower Tampa Bay Watershed in northern Manatee County with its head waters in Cedar Drain and its mouth in Terra Ceia Bay as shown in Figure 28. Frog Creek has a watershed that is split into two distinct types; the upstream developed portion and the lower natural portion. The upstream part of the water shed consists of a mix of high and medium density residential as well as some agricultural area. The lower natural portion is made up of mangrove forests and marshes as well as upland forested areas. The watershed of Frog Creek has a LDI value of 3.6 while the creek has less development immediately surrounding it giving it a buffer LDI value of 3.0. Frog Creek's banks have little development and are naturally sloping until the creek is above US41 where it becomes more ditched and less vegetated.

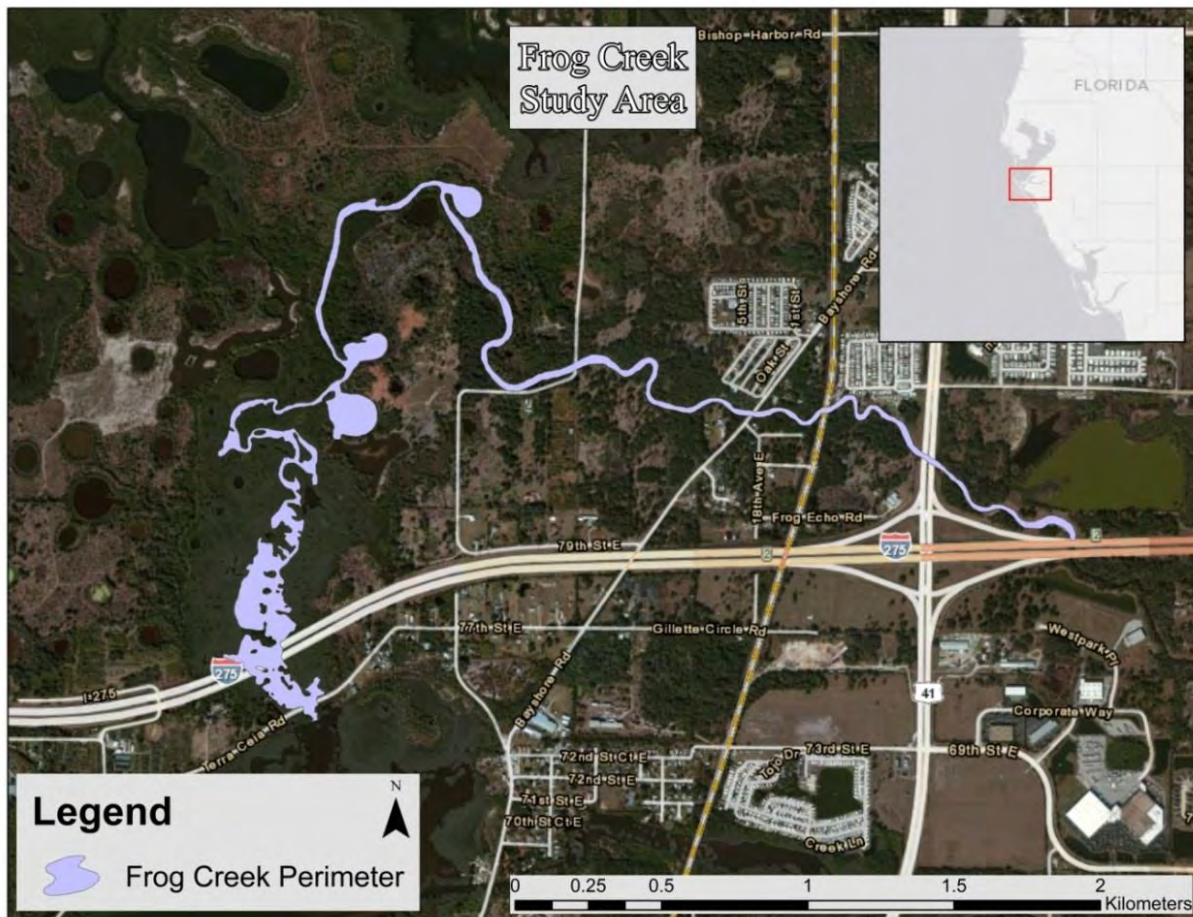


Figure 28. Overview of the Frog Creek Study Area

Vegetation Survey

The Frog Creek vegetation assessment encompassed 33 vegetation regions from the mouth in Terra Ceia Bay to the overpass at Interstate 275 as shown in Figure 29 through Figure 31. In these regions, 96 species of vegetation were identified. Regions 1 through 18 were dominated by mangroves (*Rhizophora mangle*, *Laguncularia racemosa* and *Avicennia germinans*) with few other salt tolerant species present. The most upstream mangrove was *Avicennia germinans* in Region 19. The first occurrence of Leather Fern (*Acrostichum danaeifolium*) was in Region 15, becoming dominant in regions 17-22 and 24. Needle Rush (*Juncus roemerianus*) was first observed in Region 12 with the last occurrence in Region 17. Above Region 19 the vegetation communities are populated by many species indicative of dominating freshwater influence.

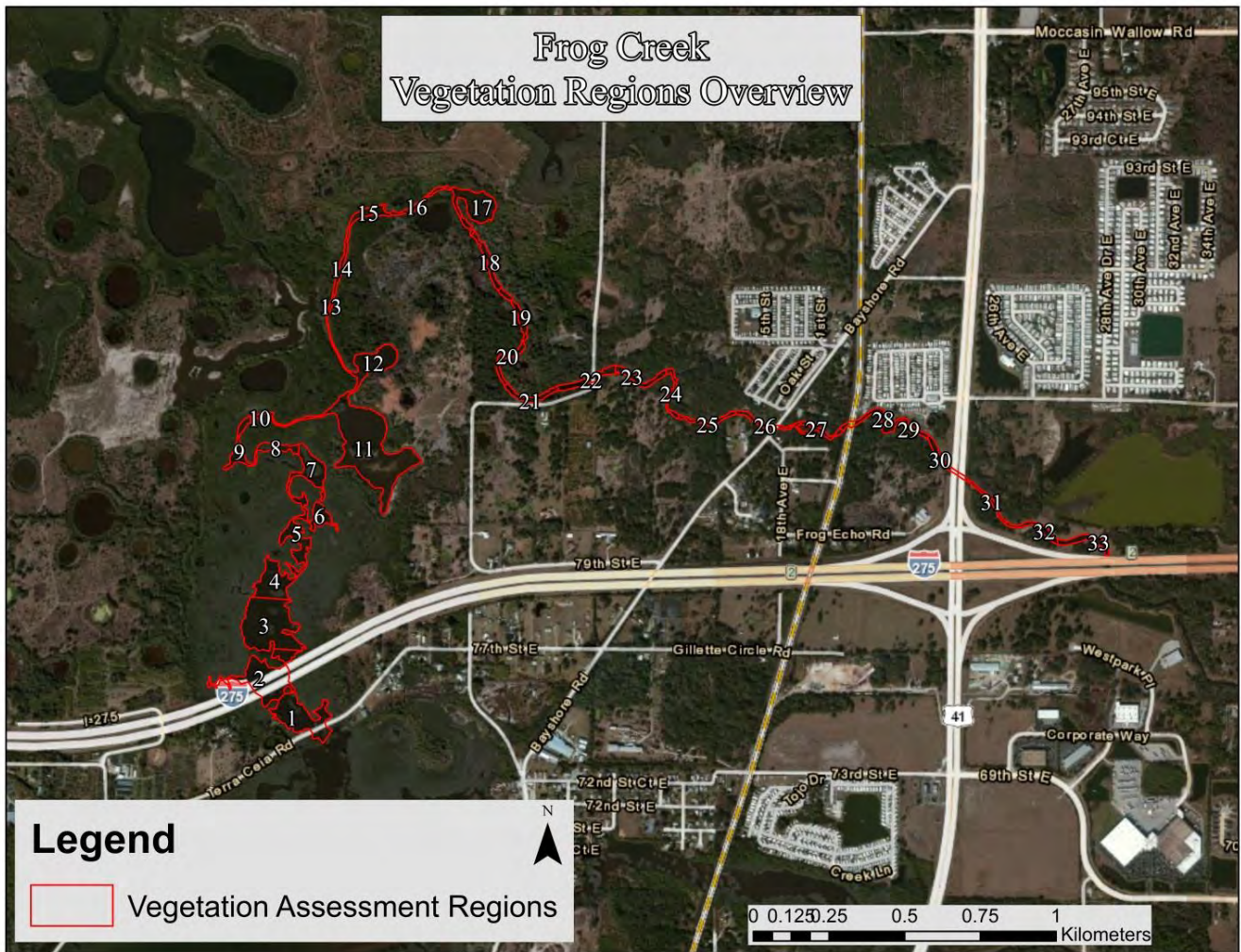


Figure 29. Overview of Frog Creek Vegetation Assessment Regions



Figure 30. Frog Creek Vegetation Assessment Regions 1-20



Figure 31. Frog Creek Vegetation Assessment Regions 21-34

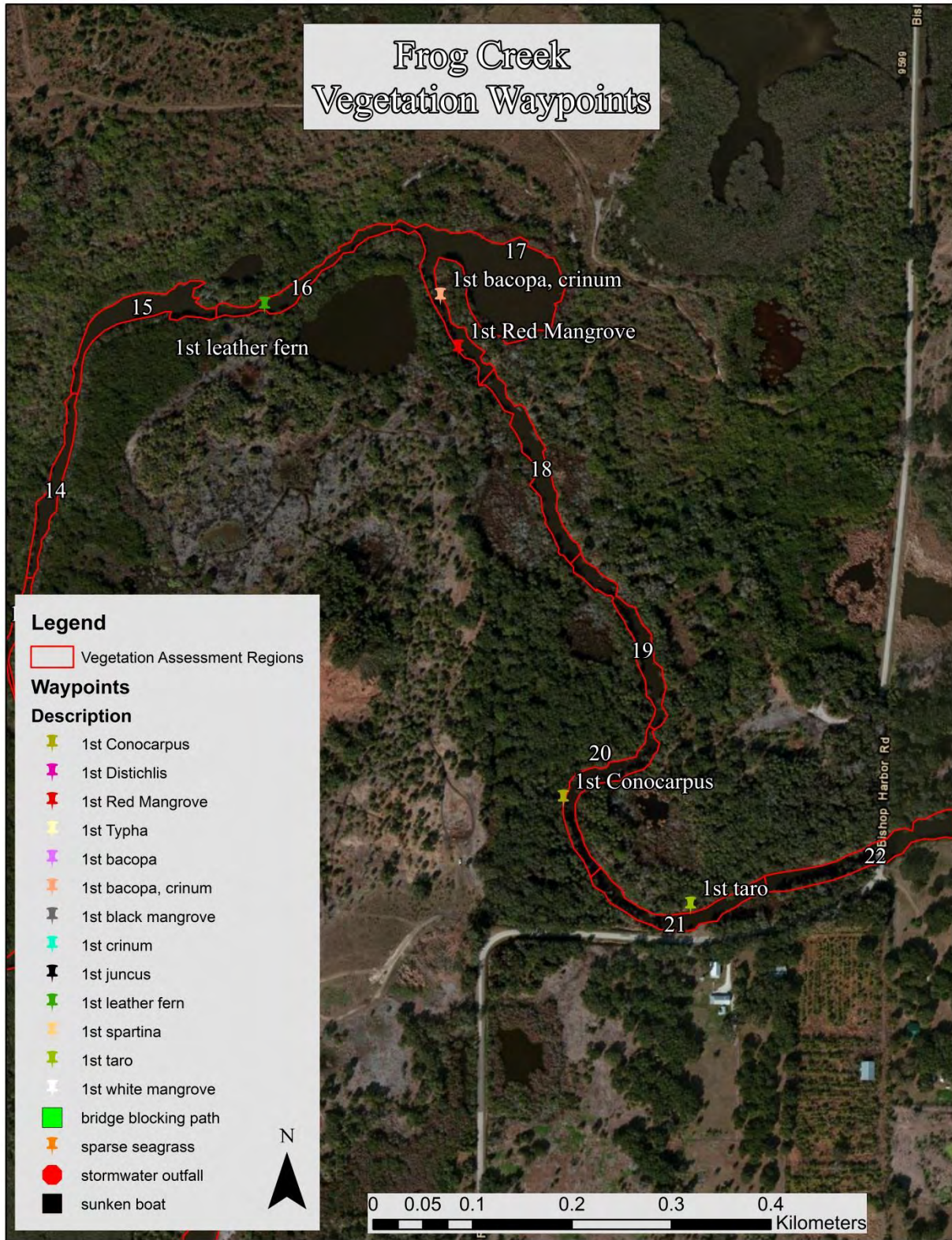


Figure 32. Frog Creek Vegetation Waypoints

Figure 32 shows the vegetation transition zone of Frog Creek indicating the most upstream Red Mangrove and *Conocarpus* as well as the most downstream Leather Fern, *Bacopa*, *Crinum* and Taro. Based on the vegetation assessment data for Frog Creek, regions 1 through 15 would comprise the highest salinity and tidal influence zone, regions 16 through 21 would comprise the “mixing” zone and regions 22 through 33 would comprise the freshwater dominant zone. The vegetation assessment species lists are shown in Table 6 through Table 8.

Table 6. Frog 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	29	30	31	32	33			
<i>Schinus terebinthifolius</i>	Brazilian Pepper								1	1		1	1	1	1		1	1	1	C	C		C	1	1	1	1	1	1	1	1	C	1			22	
<i>Avicennia germinans</i>	Black Mangrove	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																19	
<i>Panicum maximum</i>	Guneagrass	1									1				1	1			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19		
<i>Laguncularia racemosa</i>	White Mangrove	1	1	1	1	1	C	C	C	C	C	C	C	C	C	C	C	C																		18	
<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	17	
<i>Quercus virginiana</i>	Virginia Live Oak										1								1	1	1	C	C	1	1	C	C	1	1	1	1	1	1	1	1	17	
<i>Rhizophora mangle</i>	Red Mangrove	D	D	D	D	D	C	C	C	C	C	C	C	C	C	C	C																		17		
<i>Acrostichum danaeifolium</i>	Leather Fern														1	1	C	C	C	C	C	C	C	1	C	1	1	1	1			1			1	16	
<i>Commelina diffusa</i>	Dayflower																		1	1	1	1	C	C	C	C	C	1	1	C	1	1	1	1	1	15	
<i>Sabal palmetto</i>	Sabal Palm										1	1			1		1		1	1	1	1	1	1	1	1			1	1		1	1	1	1	15	
<i>Baccharis halimifolia</i>	Eastern False Willow, Saltbush										1	1		1	1	1	1	C	C	C	1	1	1													12	
<i>Colocasia esculenta</i>	Wild Taro, Dasheen, Coco Yam																						1	1	1	1	C	1	1	1	1	1	1	1	1	1	12
<i>Ruellia simplex</i>	Britton's Wild Petunia																			1			1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
<i>Dioscorea bulbifera</i>	Air Potato																			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	11
<i>Sphagneticola (Wedelia) trilobata</i>	Creeping Oxeye																																				11
<i>Conocarpus erecta</i>	Buttonwood										1	1	1	1	1	1	1	1	C	1	1																10
<i>Ludwigia peruviana</i>	Peruvian Primrosewillow																			1					1	1	1	1	1	1	1	1	1	1	1	1	10
<i>Panicum repens</i>	Torpedo Grass																			1	1	1	1	1	1	1			1	1	1	1	1	1	1	10	
<i>Bacopa monnieri</i>	Common Bacopa, Herb-Of-Grace																			1	1			1	1	1						1	1	1	1	9	
<i>Boehmeria cylindrica</i>	Bog Hemp, False Nettle																				1			1			1	1	1	1	1	1	1	1	1	1	9
<i>Crinum americanum</i>	Swamp lily																			1	1	1	1	1	1					1				1	1	9	
<i>Parthenocissus quinquefolia</i>	Woodbine											1											1	1		1	1		1				1	1	1	9	
<i>Juniperus virginiana</i>	Red Cedar											1				1		1		1	1					1	1	1								8	
<i>Syngonium podophyllum</i>	Nephtis, American Evergreen																									1	1	1	1	1	1	1	1	1	1	1	8
<i>Ulmus americana</i>	American Elm																																	1	1	8	
<i>Urena lobata</i>	Caesar's Weed																																	1	1	8	
<i>Vitis rotundifolia</i>	Muscadine Grape																																		1	8	
<i>Bidens alba</i>	White Beggar Ticks																																		1	7	

Table 7. Frog 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	29	30	31	32	33				
<i>Carya aquatica</i>	Water Hickory																									1	1		1	1	1		1	1		7		
<i>Erythrina herbacea</i>	Coralbeans																			1									1	1	1		1	1	1	7		
<i>Melothria pendula</i>	Creeping Cucumber																							1	1	1			1	1			1	1		7		
<i>Ambrosia artemisiifolia</i>	Common Ragweed																													1	1			1	1	1	6	
<i>Callicarpa americana</i>	American Beauty Berry																				1		1	1	1								1	1		6		
<i>Echinochloa crusgalii</i>	Barn Yard Grass																												1	1	1	1			1	1	6	
<i>Eupatorium capillifolium</i>	Dog Fennel																			1		1	1		1									1	1	6		
<i>Ludwigia leptocarpa</i>	Anglestem Primrosewillow																												1	1			1	1	1	1	6	
<i>Pluchea rosea</i>	Rosy Camphorweed																			1	1	1	1	1	1											6		
<i>Schoenoplectus tabernaemontani</i>	Softstem Bulrush																				1	1		1	1	1								1		6		
<i>Serenoa repens</i>	Saw palmetto																					1	1	1	C		1	1								6		
<i>Iva frutescens</i>	Marsh Elder													1	1		1	1	1																	5		
<i>Campsis radicans</i>	Trumpet Vine																			1					1		1			1						4		
<i>Echinochloa walteri</i>	Coast Cockspur Grass (hairy)																					1		1			1							1		4		
<i>Hygrophila polysperma</i>	East Indian Hygophila																																1		1	1	1	4
<i>Juncus roemerianus</i>	Needle Rush, Black Rush																				1	1			1	1										4		
<i>Leucaena leucocephala</i>	White leadtree	1																									1		1					1		4		
<i>Salix caroliniana</i>	Carolina Willow; Coastalplain Willow																							1	1	1								1		4		
<i>Symphotrichum subulatum</i>	Salt Marsh Aster																																1	1		1	4	
<i>Seteria corrugata</i>	Coastal Bristlegrass																																		1	1	4	
<i>Amaranthus australis</i>	Southern Amaranth																																				3	
<i>Ampelopsis arborea</i>	Peppervine																																		1	1	1	3
<i>Dalbergia ecastaphyllum</i>	Coin Vine																																				3	
<i>Eichhornia crassipes</i>	Water Hyacinth																																				3	
<i>Hydrocotyl umbellata</i>	Manyflower Marshpennywort, Water Pennywort																																				3	
<i>Polygonum hydropiperoides</i>	Swamp Smartweed																																				1	3
<i>Suaeda linearis</i>	Sea Blite																																					3
<i>Ricinus communis</i>	Castorbean																																				1	3

Table 8. Frog 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	29	30	31	32	33						
<i>Typha spp.</i>	Cattails																		1						1								1			3				
<i>Urochloa mutica</i>	Para Grass																									1								1	1	3				
<i>Bambusa spp.</i>	Bamboo																										1	1								2				
<i>Fraxinus caroliniana</i>	Pop Ash																																1	1		2				
<i>Hydrilla verticillata</i>	Hydrilla, water thyme																																1	1		2				
<i>Ilex vomitoria</i>	Yaupon																											1					1			2				
<i>Ipomoea cairica</i>	Mile-A-Minute Vine																		1														1			2				
<i>Mikania scandens</i>	Climbing Hempvine																									1								1			2			
<i>Musa spp.</i>	Banana Tree																					1					1										2			
<i>Polygonum densiflorum</i>	Denseflower Smartweed																																	1	1		2			
<i>Rumex</i>	Swamp Dock																							1											1		2			
<i>Sambucus canadensis</i>	Elderberry																											1						1			2			
<i>Smilax bona-nox</i>	Saw Greenbrier Cat Briar																																1	1			2			
<i>Spartina alterniflora</i>	Salt Marsh Grass										1	1																									2			
<i>Spartina bakerii</i>	Cordgrass									1																												2		
<i>Taxodium distichum</i>	Bald Cypress																																					2		
<i>Thelypteris denata</i>	Shield Fern																																		1	1		2		
<i>Enterolobium contortisiquum</i>	Earpod Tree																																		1	1		2		
<i>Abrus precatorius</i>	Rosary Pea																																					1		
<i>Andropogon glomeratus</i>	Bushy bluestem									1																												1		
<i>Baccharis augustifolia</i>	Flase Willow																																			1		1		
<i>Batis maritima</i>	Saltwort											1																										1		
<i>Borricia frutescens</i>	Sea Oxeye																1																					1		
<i>Canna flaccida</i>	Golden Canna, Bandana-Of-The-Everglades																																			1		1		
<i>Cephalanthus occidentalis</i>	Common Buttonbush																																			1		1		
<i>Cinnamomum camphora</i>	Camphor-tree																																			1		1		
<i>Cupaniopsis anacardioides</i>	Carrotwood																																		1			1		
<i>Cyperus leonti</i>	Sedge																																			1		1		
<i>Cyperus surinamensis</i>	Flat Sedge																																		1			1		
<i>Erechtites hieracifolia</i>	Fireweed																																					1		
<i>Ludwigia repens</i>	Creeping Primrosewillow, Red Ludwigia																																		1			1		
<i>Micranthemum glomeratum</i>	Manatee Mudflower, Baby's Tears																																			1		1		
<i>Myriophyllum aquaticum</i>	Parrot Feather																																			1		1		
<i>Opuntia humifusa</i>	Pricklypear Cactus																																			1		1		
<i>Paspalum urvillei</i>	Vasey Grass																																				1		1	
<i>Phyla nodiflora</i>	Frog-fruit, Carpetweed, Turkey Tangle Fogfruit																																				1		1	
<i>Pinus elliottii</i>	Slash Pine																																				1		1	
<i>Sesbania herbacea</i>	Danglepod Sesban																																				1		1	
<i>Woodwardia areolata</i>	Dimorphic Chain Fern																																				1		1	
<i>Ximenia americana</i>	Tallow Wood, Hog Plum																																					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 Frog Creek. Figure 33 shows the bottom hardness raster for Frog Creek. This map is meant to help identify locations of harder and softer bottoms for benthic invertebrate sampling, fish sampling and benthic chlorophyll sampling.

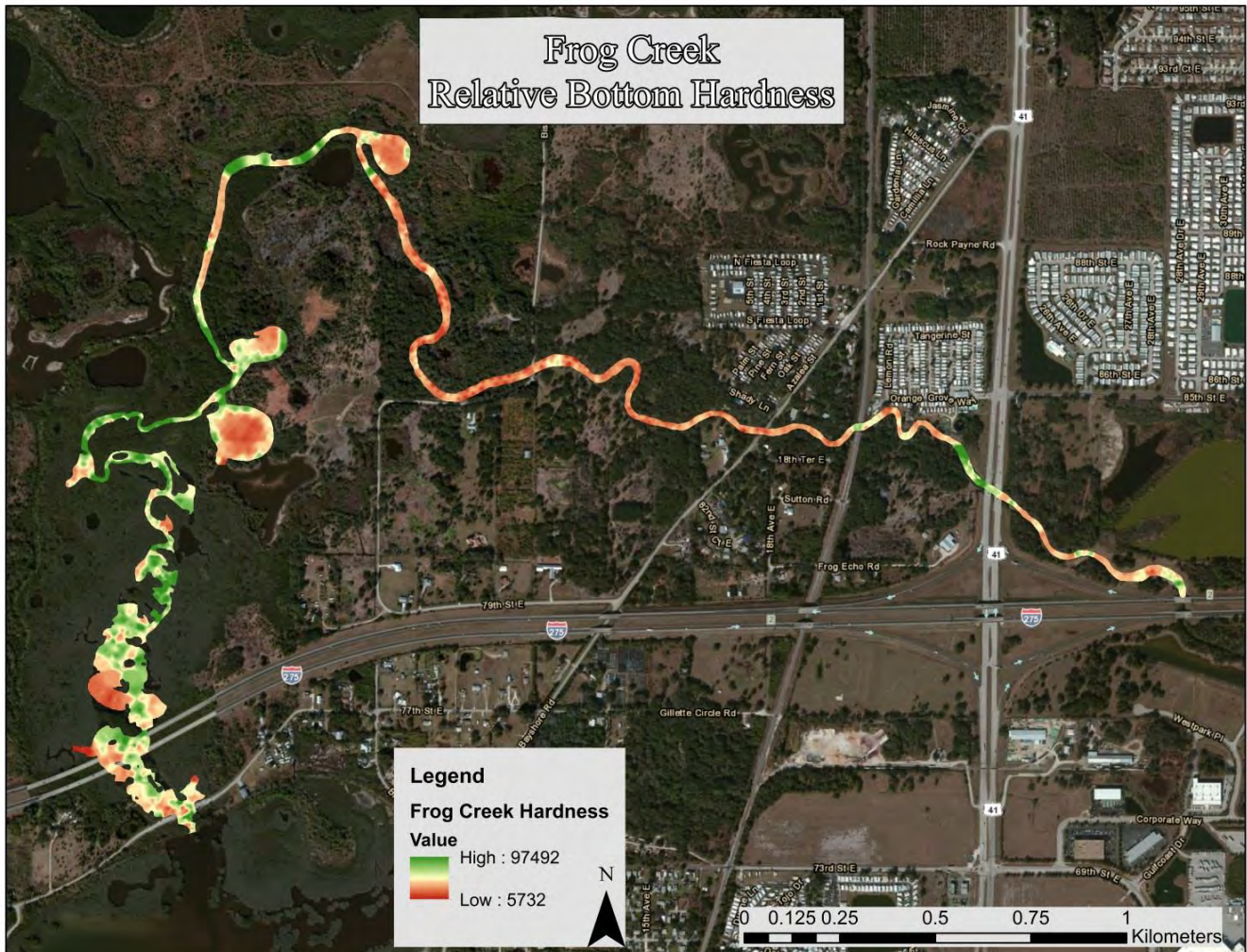


Figure 33. Frog Creek Relative Bottom Hardness Map

Bathymetry Mapping

In the study area, Frog Creek had a mean depth of 2.71 feet and a maximum depth of 8.60 feet. A total of 57.5 acres of creek was mapped during the assessment. At the time of assessment, Frog Creek contained an estimated 27,860,668 gallons of water in the study area. Figure 34 and Figure 35 detail the bathymetric mapping for Frog Creek showing the three depth stratum.



Figure 34. Frog Creek Bathymetric Stratum Map (1 of 2)



Figure 35. Frog Creek Bathymetric Stratum Map (2 of 2)