Spartman Branch Creek

STREAM HABITAT ASSESSMENT, STREAM CONDITIONS INDEX, LINEAR VEGETATION SURVEY, RAPID PERIPHYTON SURVEY AND WATER QUALITY

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Methods

STUDY AREA ANALYISIS

The watershed containing the stream being assessed was analyzed using ESRI ArcGIS 10.2. Using this software with 2016 Hillsborough County aerial, 2014 Land Use/ Land Cover (LULC) and Watershed boundary (WBID) layers courtesy of the Florida Department of Environmental Protection. The Landscape Development Intensity Index (LDI) was calculated for the WBID containing the stream. From FDEP "The Landscape Development Intensity index (LDI) is an estimate of how much humans have altered an area of interest around a waterbody. Various land use types (low density residential, row crops, industrial and natural) are assigned coefficients of land use intensity based on estimates of the amount of human energy that is put into those land use types.

The LDI is calculated by multiplying each land use coefficient by the percentage of the area of interest occupied by that land use, and then summing the results. The Florida Department of Environmental Protection (DEP) uses the LDI as a tool to estimate potential land use impacts on streams, lakes, and wetlands. LDI values less than two (≤ 2) can be considered minimally disturbed." In the Florida framework, the maximum LDI index score is approximately 42.

HABITAT AND VEGETATION ASSESSMENT

For small streams that are not easily navigated by Jonboat for bathymetric mapping and vegetation analysis, Hillsborough County requested the implementation of the Florida Department of Environmental Protection methods for Stream and River Habitat Assessment (FT 3100) (http://www.dep.state.fl.us/water/sas/sop/sops.htm) using forms FD 9000-3, FD 9000-4 and FD 9000-5, Rapid Periphyton Survey (FS 7230) using form FD 9000-25 and Linear Stream Vegetation Survey (FS 7320) using form FD 9000-32. These methods were utilized on two sampling locations on each stream, typically near access points along roadways.

Stream and River Habitat Assessment per FT3100 receives a score calculated in Form FD 9000-5. This score results from the ranking of the primary habitat components (substrate diversity, substrate availability, water velocity and habitat smothering) and secondary habitat components (Artificial channelization, bank stability, riparian buffer zone width and riparian zone vegetation quality). The maximum score possible in this method is a 160.

Two metrics are utilized in the Linear Vegetation Survey. The Mean Coefficient of Conservatism (CoC) applies a score of 0-10 to each species based on its ecological tolerances and fidelity to pre-settlement conditions. Species with higher scores show a high fidelity to native, undisturbed habitats and are typically sensitive to alterations. Available CoC scores can be obtained from LT 7000 from the Florida Department of Environmental Protection at: http://www.dep.state.fl.us/water/sas/sop/sops.htm. The Percent Florida Exotic Pest Plant Council (% FLEPPC) metric calculates the percent invasive exotics as the number of occurrences of FLEPPC Category I or II in the 100 m reach divided by the total number of taxa occurrences in the 100 m reach. The FLEPPC list can be found at: http://www.fleppc.org/list/11list.html

STREAM CONDITION INDEX ASSESSMENT

The Stream Condition Index (SCI) was sampled per DEP SOP FS7420 and calculated per DEP SOP LT7200. The SCI consists of collecting macroinvertebrates via 20 D-frame dipnet sweeps (0.5 m in length) in the most productive habitats in a 100 m reach of stream. The organisms are sub-sampled, and identified to the lowest practical taxonomic level. The SCI is composed of ten metrics, eight of which decrease in response to human disturbance, with two metrics (% very tolerant and % dominant) increasing in response to human disturbance. According to DEP SOP LT 7000, the SCI score ranges and categories are: (68-100) Exceptional; (35-67) Healthy; and (0-34) Impaired. Proposed biological health assessment criteria state that a site is considered to meet designated uses if the average of the two most recent SCI scores is 40 or higher and neither of those scores is less than 35.

WATER QUALITY ASSESSMENT

Physical water quality samples were taken using a Eureka Manta Sub-2 multiprobe pre and post calibrated daily. Measurements taken with this device include: depth, conductivity, pH, Dissolved Oxygen (mg/l and % Saturation) and salinity. Chemical water parameters were collected and preserved on ice by USF Water Institute staff and analyzed at the Environmental Protection Commission of Hillsborough County Laboratory. Analysis include; Chlorophyll (a, b, c, t and corrected), Alkalinity, Color, E. Coli, Enterococci, Ammonia, Nitrates/Nitrites, Total Phosphorous, Kjeldahl Nitrogen and Total Nitrogen.

Study Area

Spartman Branch Creek is located in eastern Hillsborough County. Its headwaters are located in Walden Lake and the outfall of Spartman Branch Creek is in Pemberton Creek. The assessment of Spartman Branch Creek was conducted on April 2, 2019. At the time of the assessment, the water levels were normal for the end of the dry season. The Spartman Branch Creek WBID covers 7.70 square miles and is dominated by residential (35.2%), natural (24.6%), industrial (11.0%), agricultural (8.6%) and commercial (6.1%) land uses. The resulting calculated landscape development intensity index score was 5.53.

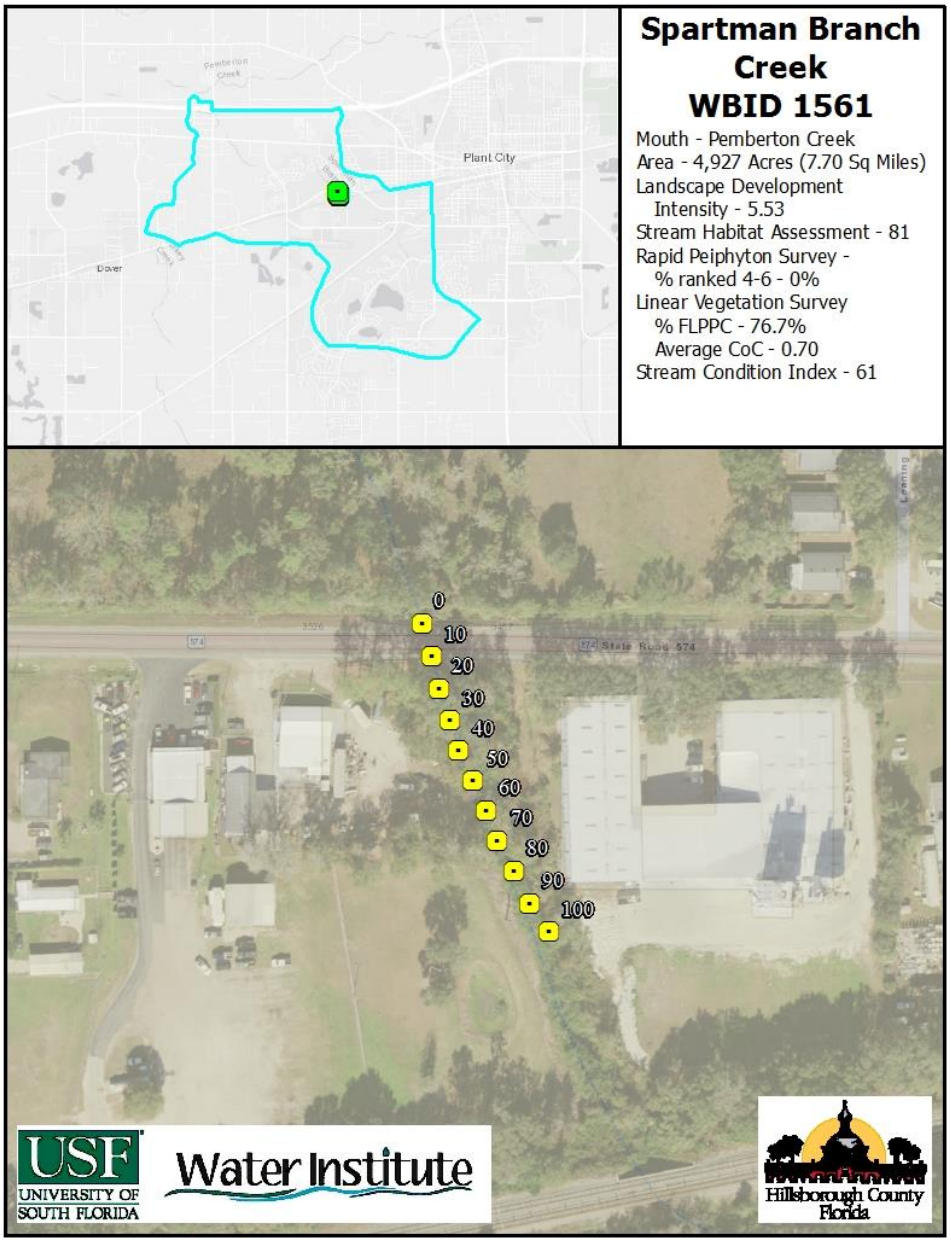

Figure 1 2019 Spartman Branch Creek Study Area Map

Figure 2 Overview photograph of Spartman Branch Creek at the Airport Rd Sample Site

Habitat and Vegetation Assessment

The region of Spartman Branch Creek where the assessment was conducted is in a dominant commercial area along Airport Rd. The region was heavily shaded with a mean canopy cover measurement of 84.8%. Spartman Branch Creek averaged 0.35 meters in depth, approximately 3.0 meters wide with a flow of 0.14 m/s.

The primary habitat components of the FDEP Habitat Assessment focus on in-water habitat. The primary habitat components score in the suboptimal category for Water Velocity Habitat Smothering (Many of the productive habitats were affected by sand smothering) and Substrate Availability (17.3% of stream are productive habitats). Marginal scores were achieved for Substrate Diversity (Presence of twomajor productive habitats (rocks, macrophytes)). Minor habitats included snags, leaf, roots sand and silt deposits. The total score for the primary habitat components was a 43 out of 80.

The secondary habitat components of the FDEP Habitat Assessment focus on the surrounding features of the stream. Spartman Branch Creek flows through an area of commercial development. The secondary habitat components scored in the suboptimal category for Bank Stability. Artificial Channelization, Riparian Zone Vegetation Quality, Riparian Buffer Width and Riparian Zone Vegetation Quality scored in the marginal category due to a mechanically straightened stream bed and riparian vegetation dominated by non-native invasive species. The riparian buffer zone surrounding the stream was 6 meters on the left bank and consisted of a mixture of native and invasive species indicative of disturbance. The right bank had a buffer averaging 5 meters and contained a mixture of invasive species and species indicative of disturbance. The vegetation in the stream itself was dominated by non-native species with 2 non-native invasive species likely from an upstream source (*Hygrophila* and *Salvinia*). The secondary habitat components received a score of 38 out of 80. The resulting FDEP Habitat Assessment score was an 81.

Periphyton was not encountered during the 99 samples taken during the Rapid Periphyton Survey. The tree canopy in the assessment area averaged 84.8% limiting available sunlight for macrophytes and algae.

The FDEP Linear Vegetation Survey encountered 13 herbaceous species in Spartman Branch Creek. *Alternanthera philoxeroides* and *Hygrophila polysperma, Salvinia minima, Ludwigia peruviana, Sphagneticola trilobata* and *Urochloa mutica* are non-native invasive species. Only *Hygrophila* was abundant and dominant in the assessment region.

Table 1 Linear Vegetation Survey Results – Spartman Branch Creek

Taxa Name	C of C Score	Sample Site										Total Occurrences
		0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	
Hygrophila polysperma	0	1	D	D	D	D	D	D	D	D	D	10
Lemna	1	1	1	1	1	1	1	1	1	1	1	10
Salvinia minima	0	1	1	1	1	1	1	1	1	1	1	10
Alternanthera philoxeroides	0		1	1	1	1	1	1	1	1	1	9
Commelina diffusa	2.02			1	1	1	1	1	1	1	1	8
Ludwigia peruviana	0			1	1	1				1		4
Sphagneticola trilobata	0			1			1		1			3
Bidens alba	1				1							1
Ceratopteris thalictroides	2.93		1									1
Mikania scandens	1.95					1						1
Nuphar	3.5									1		1
Saururus cernuus	6.5							1				1
Urochloa mutica	0			1								1
Mean Coefficient of Conservatism	0.7											
% FLEPPC	76.70%											

Figure 3 Example of the typical habitats observed in Spartman Branch Creek illustrating the density of Hygrophila.

Stream Condition Index

The analysis of the SCI sample involves splitting the sample into 2 aliquots for analysis. The SCI metrics are then calculated on each separately. The final SCI score is an average of the two scores. The SCI score for Spartman Branch Creek was 61 out of a possible 100 points, corresponding with a "Healthy" designation, with the expected community of a healthy stream.

High scores were achieved for the Total Ephemeroptera in sample B, % Tanytarsini in both subsamples and % Filter Feeder in sample A metrics. Both subsamples contained sensitive taxa and Long Lived Taxa. The full results of the SCI sampling are shown in Table 3 (Sample A) and Table 4 (Sample B) for Spartman Branch Creek.

Table 2 SCI metric summaries for Spartman Branch Creek

SCI Metric	Raw Totals	SCI scores	Adjusted SCI scores
Total Taxa	28.00	5.42	5.42
Total Ephemeroptera	3.00	6.00	6.00
Total Trichoptera	2.00	2.86	2.86
% Filter Feeders	30.94	7.03	7.03
Total Clingers	4.00	5.71	5.71
Total Long-lived Taxa	1.00	3.33	3.33
% Dominance	35.00	5.80	5.80
% Tanytarsini	28.75	9.98	9.98
Total Sensitive Taxa	2.00	2.86	2.86
% Very Tolerant Individuals	3.13	8.21	8.21

SCI Sum	57.20
Final SCI score	63.55

SCI Metric	Raw Totals	SCI scores	Adjusted SCI scores
Total Taxa	30.00	6.25	6.25
Total Ephemeroptera	5.00	10.00	10.00
Total Trichoptera	1.00	1.43	1.43
% Filter Feeders	25.47	5.76	5.76
Total Clingers	3.00	4.29	4.29
Total Long-lived Taxa	1.00	3.33	3.33
% Dominance	35.22	5.76	5.76
% Tanytarsini	24.53	9.53	9.53
Total Sensitive Taxa	1.00	1.43	1.43
% Very Tolerant Individuals	12.58	5.23	5.23

SCI Sum	53.00
Final SCI score	58.89

Table 3 SCI full results for Sample A

Stream Condition Index Results for Spartman Branch SCIA

Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Abundance	Collapsed Abundance	Taxa Presence	Ephemeroptera	Trichoptera Taxa	50% Filterer	100% Filterer	Clinger Taxa	Long-lived Taxa	Dominant Taxa	Tanytarsini	Sensitive Taxa	Very Tolerant	Specimen Notes
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	Tubificinae spp.	1	1	1	0	0	0	0	0	0		0	0	0	Damaged and/or
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	*Slavina appendiculata*	1	1	1	0	0	0	0	0	0		0	0	0	
Annelida		Clitellata	Hirudinida			Hirudinida spp.	1		0	0	0	0	0	0	0		0	0	0	Immature
Annelida		Clitellata	Hirudinida	Rhynchobdellid	Glossiphoniidae	*Helobdella stagnalis* sp.	1	2	1	0	0	0	0	0	0		0	0	2	
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Ancylidae	Ancylidae spp.	5	5	1	0	0	0	0	0	0		0	0	0	Damaged and/or
Mollusca		Gastropoda	Caenogastropo	Littorinimorpha	Hydrobiidae	*Pyrgophorus platyrachis*	1	1	1	0	0	0	0	0	0		0	0	1	
Mollusca		Gastropoda	Caenogastropo	Littorinimorpha	Hydrobiidae	*Amnicola dalli*	57	56	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Crustacea	Malacostrac	Eumalacostrac	Amphipoda	Dogielinotidae	*Hyalella azteca* sp. complex	10	10	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Crustacea	Malacostrac	Eumalacostrac	Decapoda	Cambaridae	Cambaridae spp.	1	1	1	0	0	0	0	0	1		0	0	0	Damaged
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Caenidae	*Caenis diminuta*	3	3	1	1	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	Baetidae spp.	1	1	1	1	0	0	0	0	0		0	0	0	Damaged
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Heptageniidae	Heptageniidae spp.	2		0	0	0	0	0	0	0		0	0	0	Damaged
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Heptageniidae	*Stenacron interpunctatum*	1	3	1	1	0	0	0	1	0		0	1	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Coenagrionidae	Coenagrionidae spp.	5	5	1	0	0	0	0	0	0		0	0	0	Damaged and/or
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	*Cheumatopsyche* spp.	8	8	1	0	1	0	8	1	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydroptilidae	*Oxyethira* spp.	1	1	1	0	1	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Dubiraphia* spp.	1	1	1	0	0	0	0	0	0		0	0	0	adult
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Microcylloepus* spp.	1	1	1	0	0	0	0	0	0		0	0	0	larva
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Gyrinidae	*Dineutus* spp.	1	1	1	0	0	0	0	0	0		0	0	0	larva
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Chironomidae spp.	4		0	0	0	0	0	0	0		0	0	0	pupae
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Cladotanytarsus* spp.	8	9	1	0	0	4.5	0	0	0		9	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus bucklevi*	1	1	1	0	0	0.5	0	0	0		1	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum flavum*	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum illinoense* group	2	2	1	0	0	0	0	0	0		0	0	2	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Rheotanytarsus exiguus*	32	35	1	0	0	0	35	1	0		35	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Pentaneura inconspicua*	2	2	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Stenochironomus* spp.	3	3	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Corynoneura* spp.	2	2	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Paratanytarsus* spp.	1	1	1	0	0	0.5	0	0	0		1	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Labrundinia* spp.	2	2	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Simuliidae	*Simulium* spp.	1	1	1	0	0	0	1	1	0		0	1	0	larva

Table 4 SCI full results for Sample B

Stream Condition Index Results for Spartman Branch SCIB

Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Abundance	Collapsed Abundance	Taxa Presence	Ephemeroptera	Trichoptera Taxa	50% Filterer	100% Filterer	Clinger Taxa	Long-lived Taxa	Dominant Taxa	Tanytarsini	Sensitive Taxa	Very Tolerant	Specimen Notes
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	*Slavina appendiculata*	4	4	1	0	0	0	0	0	0		0	0	0	
Annelida		Clitellata	Hirudinida	Rhynchobdel	Glossiphoniidae	Glossiphoniidae spp.	1		0	0	0	0	0	0	0		0	0	0	Immature
Annelida		Clitellata	Hirudinida	Rhynchobdel	Glossiphoniidae	*Helobdella stagnalis* sp.	2	3	1	0	0	0	0	0	0		0	0	3	
Annelida		Clitellata	Hirudinida	Rhynchobdel	Glossiphoniidae	*Helobdella papillata*	1	1	1	0	0	0	0	0	0		0	0	1	
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Ancylidae	*Laevapex fuscus*	6	6	1	0	0	0	0	0	0		0	0	6	
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Planorbidae	*Menetus dilatatus*	3	3	1	0	0	0	0	0	0		0	0	3	
Mollusca		Gastropoda	Caenogastropoda	Littorinimorp	Hydrobiidae	*Pyrgophorus platyrachis*	4	4	1	0	0	0	0	0	0		0	0	4	
Mollusca		Gastropoda	Caenogastropoda	Littorinimorp	Hydrobiidae	*Amnicola dalli*	56	56	1	0	0	0	0	0	0		0	0	0	
Mollusca		Bivalvia	Heterodonta	Veneroida	Corbiculidae	*Corbicula* spp.	1	1	1	0	0	0	1	0	1		0	0	0	
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Dogielinotidae	*Hyalella azteca* sp. complex	12	12	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeropte	Caenidae	*Caenis diminuta*	2	2	1	1	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeropte	Baetidae	*Callibaetis floridanus*	1	1	1	1	0	0	0	0	0		0	0	0	Reference collection
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeropte	Baetidae	*Labiobaetis ephippiatus*	1	1	1	1	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeropte	Baetidae	*Pseudocentroptiloides usa*	1	1	1	1	0	0	0	0	0		0	0	0	Reference collection
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeropte	Heptageniidae	Heptageniidae spp.	2	2	1	1	0	0	0	1	0		0	1	0	Damaged and/or immature
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Coenagrionidae	Coenagrionidae spp.	5	5	1	0	0	0	0	0	0		0	0	0	Damaged and/or immature
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	*Cheumatopsyche* spp.	5	5	1	0	1	0	5	1	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Chironomidae spp.	1		0	0	0	0	0	0	0		0	0	0	pupa
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Cladotanytarsus* spp.	7	7	1	0	0	3.5	0	0	0		7	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus bucklevi*	1	1	1	0	0	0.5	0	0	0		1	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum flavum*	2	2	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum illinoense* group	1	1	1	0	0	0	0	0	0		0	0	1	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Rheotanytarsus exiguus*	29	30	1	0	0	0	30	1	0		30	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Ablabesmyia mallochi*	3	3	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Pentaneura inconspicua*	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Stenochironomus* spp.	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Nanocladius* spp.	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Paratanytarsus* spp.	1	1	1	0	0	0.5	0	0	0		1	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Labrundinia* spp.	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Heteroptera	Gerridae	Gerridae spp.	1	1	1	0	0	0	0	0	0		0	0	0	Immature
Arthropoda	Hexapoda	Insecta	Pterygota	Lepidoptera	Crambidae	Argyractini spp.	1	1	1	0	0	0	0	0	0		0	0	1	Immature, either Petrophila santafealis or Neargyractis slossonalis
Arthropoda	Hexapoda	Insecta	Pterygota	Lepidoptera	Crambidae	Elophila spp.	1	1	1	0	0	0	0	0	0		0	0	1	

Water Quality Assessment

Long-term water quality data is available for Spartman Branch Creek. The data that is available was collected by the Hillsborough County Environmental Protection Commission. Values for the physical water parameters begin in 2005 and continue through present. Values for the laboratory water parameters begin in 2005 through present including the sample taken along with this assessment. The 2019 USF Water Institute Assessment fall within the range of the previous data collections. Table 5 provides a summary of the Physical/Chemical conditions recorded at the site.

Table 5 Spartman Branch Creek Physical Water Quality (Field)

Spartman Branch Creek								
Date	**Depth (m)**	**Temp (°C)**	**pH**	**DO (mg/L)**	**DO (% Sat)**	**Cond (UMHO/cm**	**Salinity (PPT)**	**Secchi Depth (m)**
4/2/19	0.08	20.4	7.8	2.55	27.7	146.9	0.07	0.5 VOB
Mean POR		21.50	6.80	4.29	49.12	166.0	0.08	0.45

The chemical water quality analysis for Spartman Branch Creek is shown in Table 6 along with mean values for the period of record for available parameters. Period of record mean and the sample for this assessment for Total Phosphorous values were below the nutrient region threshold developed by FDEP of 0.49 mg/L with a mean value of 0.124 mg/L (2005-2019). The three year geometric mean of Total Phosphorous was 0.254 mg/L. Total Phosphorous values for the sample from this assessment were 0.432mg/L. Total Nitrogen values were below the nutrient region threshold developed by FDEP of 1.65 mg/L with a mean value of 0.374 mg/L (2005-2019). The three year geometric mean of Total Nitrogen was 0.846 mg/L. The Total Nitrogen value from the assessment was below the threshold with a concentration of 0.630 mg/L. Chlorophyll-a corrected values fall below the site specific evaluation range of 3.2 µg/l to 20 µg/l for the period of record (2.98 µg/l 2005-2018), and in the site specific evaluation range for the most recent three year geomean (3.70 µg/l) . For sites with Chlorophyll-a values in this range, the assessment is inconclusive of conditions reflecting an imbalance in flora. Elevated biomass of the bacterial parameters was observed in the long term dataset with E. Coli having a geomean of 207 colonies/100 ml, 906/100 ml for Enterococci.

Table 6 Spartman Branch Creek Water Quality (Laboratory)

Parameter	Spartman Branch Creek	POR Mean	Units
Alkalinity	38.0		mg/LCaCO3
Nitrates/Nitrites	0.056	0.021	mg/L
E. Coli	233	207	#/100 ml
Enterococci	940	906	#/100 ml
Chlorophyll a	2.0	3.83	ug/L
Chlorophyll b	0.5	1.03	ug/L
Chlorophyll c	0.4	0.54	ug/L
Chlorophyll t	2.0		ug/L
Chlorophylla Corr	4.1	2.98	ug/L
Chlorophyll-pheo	5.4		ug/L
Ammonia	0.008	0.012	mg/L
Kjeldahl Nitrogen	0.630	0.342	mg/L
Total Nitrogen	0.686	0.374	mg/L
Total Phosphorus	0.432	0.124	mg/L
Color(345)F.45	38.5	129.2	Pt/Co

Conclusion

Spartman Branch Creek at Airport Rd is located in a predominantly commercial and residential area. The stream itself was altered in the past in the region assessed. At the time of the habitat assessment, the water levels were low, corresponding to the middle of the dry season, however sufficient habitat for macroinvertebrates was observed. Due to these factors, the Habit Assessment resulted in a marginal score of 81. Disruption to the vegetation community was observed in the results of the Linear Vegetation Survey with Spartman Branch Creek not meeting either metric for Average Coefficient of Conservatism or the Percent FLEPPC. Spartman Branch Creek did meet standards for the rapid periphyton survey with 0% of samples being ranked between 4 and 6. The historical water quality record for Spartman Branch Creek showed acceptable concentrations of Total Phosphorous and Total Nitrogen. The results of the SCI sampling indicate that the stream is "healthy" based on the macroinvertebrate community. Table 7 summarizes the results of the nutrient sampling, floristic sampling, habitat assessment and SCI.

Table 7 Summary of Water Quality, Floristic Surveys and Habitat Assessments

Measure		Spartman Branch Creek	Mean POR	Threshold
Total Phosphorous (mg/l)		0.432	0.124	< 0.49
Total Nitrogen (mg/l)		0.686	0.374	< 1.65
RPS (% Rank 4-6)		0%		< 25%
LVS	**Avg C of C**	0.70		≥ 2.5
	FLEPPC %	76.7%		< 25%
Chlorophyll (µg/l)		4.1	2.98	< 20 µg/l
Habitat Assessment		81		> 34
SCI		61		> 34