Rocky Creek (Upper Segment)

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

David Eilers, William Dudley | USF Water Institute | January 15, 2020

Methods

STUDY AREA ANALYISIS

The watershed containing the stream being assessed was analyzed using ESRI ArcGIS 10.2. Using this software with 2020 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

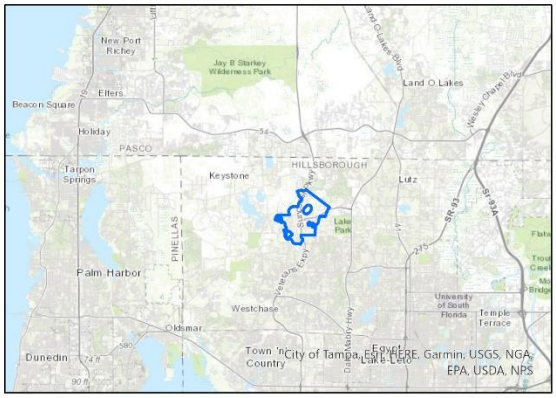
The Stream Condition Index (SCI) was sampled per DEP SOP FS7420 and calculated per DEP SOP LT7200. The SCI consists of collecting macroinvertebrates via 20 D-frame dipnet sweeps (0.5 m in length) in the most productive habitats in a 100 m reach of stream. The organisms are sub-sampled, and identified 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

Rocky Creek Upper Segment is located in north-western Hillsborough County. Its headwaters are located in Lake Carlton and the outfall of Rocky Creek is in Old Tampa Bay. The assessment of Rocky Creek was conducted on January 15, 2020. At the time of the assessment, the water levels were normal for the end of the dry season. The Upper Rocky Creek WBID covers 1.55 square miles and is dominated by residential (42.6%) and natural (31.8%) land uses. The resulting calculated landscape development intensity index score was 4.82.



Rocky Creek Upper Segment WBID 1463

Mouth - Rocky Creek (Lower Segment)
Area - 2,407 Acres (1.55 Sq Miles)
Landscape Development Intensity - 4.82
Stream Habitat Assessment - 112
Rapid Peiphyton Survey - % ranked 4-6 - 0%
Linear Vegetation Survey - > 2m^2 % FLPPC - 20%
Average CoC - 3.86
Stream Condition Index - 65

Figure 1 2020 Rocky Creek Upper Segment Study Area Map

Figure 2 USF Water Institute intern William Dudley assisting at the Rocky Creek Sample Site

Habitat and Vegetation Assessment

The region of Rocky Creek where the assessment was conducted is in a natural area surrounded by a predominantly residential area. The region was heavily shaded with a mean canopy cover measurement of 86.7%. Rocky Creek averaged 0.3 meters in depth, approximately 4.0 meters wide with a flow of 0.26 m/s.

The primary habitat components of the FDEP Habitat Assessment focus on in-water habitat. The primary habitat components score in the optimal category for Water Velocity. Substrate Diversity (Presence of three major productive habitats (snags, roots and macrophytes)) and Habitat Smothering (adequate stable pools and many of the productive habitats were affected by sand/silt smothering) received suboptimal scores. Substrate Availability (6.7% of stream are productive habitats) were scored as marginal. Minor habitats included leaf pack/mats, rock, sand and silt deposits. The total score for the primary habitat components was a 48 out of 80.

The secondary habitat components of the FDEP Habitat Assessment focus on the surrounding features of the stream. The secondary habitat components scored in the optimal category for and Riparian Buffer Zone Width (right bank) and Bank Stability (few raw, eroded areas) and Riparian Zone Vegetation Quality (right bank). Artificial Channelization, Riparian Buffer Zone Width (left bank) and Riparian Zone Vegetation Quality (left bank) scored in the suboptimal category due to previous straightening of the stream channel and an increase of non-native invasive species on the left bank. The riparian buffer zone surrounding the stream was greater than 18 meters on the right bank and 12 meters on the left bank. The vegetation consisted of a mixture of native and invasive species indicative of disturbance. The vegetation in the stream itself was mostly native species with 2 non-native invasive species out of 11 total species. The secondary habitat components received a score of 64 out of 80. The resulting FDEP Habitat Assessment score was a 112.

Periphyton was not encountered during the 99 samples taken during the Rapid Periphyton Survey. The tree canopy in the assessment area averaged 86.7% limiting available sunlight for macrophytes and algae.

The FDEP Linear Vegetation Survey encountered 11 herbaceous species in Little Bullfrog Creek. *Alternanthera philoxeroides* and *Limnophila sessiflora* are non-native invasive species. Only *Limnophila sessiflora* was abundant and dominant in the assessment region with extensive growths along the shoreline in meters 0-10. The calculated metrics for the Linear Vegetation Index are the Mean Coefficient of Conservatism and Percent FLEPPC species. The mean CoC metric has a threshold of > 2.0. The calculated mean CoC score for the study area was 3.86. The % FLEPCC metric has a threshold of < 25%. The calculated % FLEPPC metric for the sample area was 20%. The Rocky Creek Upper Segment study area does not show imbalance based on the Linear Vegetation Survey.

Table 1 Linear Vegetation Survey Results – Upper Rocky 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	
Osmunda cinnamomea	6.44					1	1	1	1	1		5
Alternanthera philoxeroides	0	1			1			1			1	4
Hydrocotyle umbellata	1.92	1		1	1			1				4
Osmunda regalis	7.6							1	1	1		3
Centella asiatica	1.92						1	1				2
Micranthemum umbrosum	5.66	1						1				2
Blechnum serrulatum	5.5		1									1
Commelina virginica	4.67	1										1
Limnophila sessiliflora	0	D										1
Ludwigia repens	3.2		1									1
Sacciolepis striata	5.35	1										1

Figure 3 Typical banks and buffer vegetation along Rocky Creek.

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 Rocky Creek was 65 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 % Tanytarsini, % Dominance and Total Taxa in both subsamples. Sample B received low scores for Total Sensitive Taxa. 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 Rocky Creek.

Table 2 SCI metric summaries for Rocky Creek (upper segment) for Sample A (top) and Sample B (bottom)

SCI Metric	Raw Totals	SCI scores	Adjusted SCI scores
Total Taxa	37.00	9.17	9.17
Total Ephemeroptera	2.00	4.00	4.00
Total Trichoptera	3.00	4.29	4.29
% Filter Feeders	22.08	4.97	4.97
Total Clingers	4.00	5.71	5.71
Total Long-lived Taxa	2.00	6.67	6.67
% Dominance	13.64	10.07	10.00
% Tanytarsini	17.53	8.59	8.59
Total Sensitive Taxa	3.00	4.29	4.29
% Very Tolerant Individuals	9.74	5.82	5.82

SCI Sum	63.49
Final SCI score	70.55

SCI Metric	Raw Totals	SCI scores	Adjusted SCI scores
Total Taxa	36.00	8.75	8.75
Total Ephemeroptera	2.00	4.00	4.00
Total Trichoptera	2.00	2.86	2.86
% Filter Feeders	23.27	5.25	5.25
Total Clingers	4.00	5.71	5.71
Total Long-lived Taxa	1.00	3.33	3.33
% Dominance	13.21	10.16	10.00
% Tanytarsini	20.13	8.97	8.97
Total Sensitive Taxa	1.00	1.43	1.43
% Very Tolerant Individuals	27.04	3.42	3.42

SCI Sum	53.72
Final SCI score	59.69

Table 3 SCI full results for Sample A

Stream Condition Index Results for Rocky Creek at Tobacco SCIA

Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Abundance	Collapsed	Taxa Presence	Ephemeroptera	Trichoptera	50% Filterer	100% Filterer	Clinger Taxa	Long-lived Taxa	Dominant Taxa	Tanytarsini	Sensitive Taxa	Very Tolerant	Specimen Notes
Nemertea		Enopla		Hoplonemertea	Tetrastemmatidae	*Prostoma* spp.	1	1	1	0	0	0	0	0	0		0	0	1	
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	*Aulodrilus pigueti*	1	1	1	0	0	0	0	0	0		0	0	0	
Annelida		Clitellata	Hirudinida	Rhynchobdellida	Glossiphoniidae	*Helobdella stagnalis* sp. complex	1	1	1	0	0	0	0	0	0		0	0	1	
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Ancylidae	Ancylidae spp.	8	8	1	0	0	0	0	0	0		0	0	0	Damaged
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Physidae	Physidae spp.	1	1	1	0	0	0	0	0	0		0	0	0	Damaged
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Planorbidae	Planorbidae spp.	7	7	1	0	0	0	0	0	0		0	0	7	Damaged
Mollusca		Bivalvia	Heterodonta	Veneroida	Corbiculidae	*Corbicula* spp.	6	6	1	0	0	0	6	0	1		0	0	0	
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda		Senticaudata spp.	1	1	1	0	0	0	0	0	0		0	0	0	Damaged, head only
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Dogielinotidae	*Hyalella azteca* sp. complex	21	21	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Caenidae	*Caenis* spp.	4	4	1	1	0	0	0	0	0		0	0	0	Immature
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Heptageniidae	Heptageniidae spp.	1		0	0	0	0	0	0	0		0	0	0	Damaged
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Heptageniidae	*Stenacron interpunctatum*	6	7	1	1	0	0	0	1	0		0	1	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Macromiidae	*Macromia* spp.	1	1	1	0	0	0	0	0	1		0	1	0	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	Leptoceridae	*Oecetis persimilis*	1	1	1	0	1	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Leptoceridae	*Oecetis* sp. E	2	2	1	0	1	0	0	0	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	1larva
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Stenelmis* spp.	2	2	1	0	0	0	0	1	0		0	0	0	2larvae
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Gyrinidae	*Dineutus* spp.	1	1	1	0	0	0	0	0	0		0	0	0	1larva
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Chironomidae spp.	1		0	0	0	0	0	0	0		0	0	0	1pupa
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Cladotanytarsus* spp.	1	1	1	0	0	1	0	0	0		1	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus* spp.	2	2	1	0	0	2	0	0	0		2	0	0	not buckleyi
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus buckleyi*	8	8	1	0	0	8	0	0	0		8	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum halterale* group	5	5	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum scalaenum* group	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum flavum*	15	15	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum illinoense* group	5	5	1	0	0	0	0	0	0		0	0	5	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Rheotanytarsus exiguus* group	15	16	1	0	0	0	16	1	0		16	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Ablabesmyia rhamphe* group	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tribelos fuscicorne*	1	1	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.	13	13	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Corynoneura* spp.	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Thienemanniella* spp.	5	5	1	0	0	0	0	0	0		0	0	0	not xena
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Labrundinia* spp.	3	3	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Thienemannimyia* grp. sp.	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	1pupa
Arthropoda	Hexapoda	Insecta	Pterygota	Lepidoptera	Crambidae	*Elophila* spp.	1	1	1	0	0	0	0	0	0		0	0	1	

Table 4 SCI full results for Sample B

Stream Condition Index Results for Rocky Creek at Tobacco SCIB

Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Abundance	Collapsed	Taxa Presence	Ephemeroptera	Trichoptera	50% Filterer	100% Filterer	Clinger Taxa	Long-lived Taxa	Dominant Taxa	Tanytarsini	Sensitive Taxa	Very Tolerant	Specimen Notes
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	*Aulodriluspigueti*	1	1	1	0	0	0	0	0	0		0	0	0	
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	*Pristinaamericana*	2	2	1	0	0	0	0	0	0		0	0	0	
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	*Naisvariabilis*	3	3	1	0	0	0	0	0	0		0	0	3	
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	*Bratislaviaunidentata*	1	1	1	0	0	0	0	0	0		0	0	1	
Annelida		Clitellata	Oligochaeta	Lumbriculida	Lumbriculidae	*Eclipidriluslacustris*	1	1	1	0	0	0	0	0	0		0	0	0	
Annelida		Clitellata	Hirudinida	Rhynchobdell	Glossiphoniidae	*Helobdellastagnalis* sp.	1	1	1	0	0	0	0	0	0		0	0	1	
Mollusca		Gastropoda	Caenogastropoda		Pleuroceridae	*Pleurocerafloridensis*	4	4	1	0	0	0	0	0	0		0	0	0	
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Ancylidae	Ancylidae spp.	15		0	0	0	0	0	0	0		0	0	0	Damaged and/or
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Ancylidae	*Hebetancylusexcentricus*	1	16	1	0	0	0	0	0	0		0	0	16	
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Physidae	Physidae spp.	2	2	1	0	0	0	0	0	0		0	0	0	Damaged
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Planorbidae	Planorbidae spp.	9	9	1	0	0	0	0	0	0		0	0	9	Damaged and/or
Mollusca		Bivalvia	Heterodonta	Veneroida	Corbiculidae	*Corbicula* spp.	3	3	1	0	0	0	3	0	1		0	0	0	
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Dogielinotidae	*Hyalella azteca* sp. complex	10	10	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Caenidae	*Caenisdiminuta*	6	6	1	1	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Heptageniidae	Heptageniidae spp.	1	1	1	1	0	0	0	1	0		0	1	0	Damaged
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Coenagrionidae	Coenagrionidae spp.	5		0	0	0	0	0	0	0		0	0	0	Damaged and/or
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Coenagrionidae	*Enallagma* spp.	2	7	1	0	0	0	0	0	0		0	0	0	Damaged and/or
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Leptoceridae	*Oecetispersimilis*	1	1	1	0	1	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	*Cheumatopsyche* spp.	2	2	1	0	1	0	2	1	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Dubiraphia* spp.	1	1	1	0	0	0	0	0	0		0	0	0	1larva
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Stenelmis* spp.	1	1	1	0	0	0	0	1	0		0	0	0	1larva
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Gyrinidae	*Dineutus* spp.	1	1	1	0	0	0	0	0	0		0	0	0	1larva
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Chironomidae spp.	4		0	0	0	0	0	0	0		0	0	0	4 pupae
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus* spp.	5	5	1	0	0	5	0	0	0		5	0	0	not buckleyi
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsusbuckleyi*	5	5	1	0	0	5	0	0	0		5	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilumhalterale* group	2	2	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilumscalaenum* group	4	4	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilumflavum*	12	13	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilumillinoense* group	12	13	1	0	0	0	0	0	0		0	0	13	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Rheotanytarsusexiguus* group	20	21	1	0	0	0	21	1	0		21	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Ablabesmyiamallochi*	3	3	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tribelosfuscicorne*	2	2	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Stenochironomus* spp.	10	11	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	*Thienemanniella* spp.	1	1	1	0	0	0	0	0	0		0	0	0	not xena
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Thienemanniellaxena*	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Paratanytarsuslongistylus*	1	1	1	0	0	1	0	0	0		1	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Thienemannimyia* grp. sp.	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Ceratopogonidae	*Atrichopogon* spp.	1	1	1	0	0	0	0	0	0		0	0	0	1larva

Water Quality Assessment

Long-term water quality data is available for Rocky Creek Upper Segment. The data that is available was collected by the Hillsborough County Environmental Protection Commission (2005- 2020) and the Florida Department of Environmental Protection (2017-2020). Values for the physical water parameters begin in 2005 and continue through 2020. Values for the laboratory water parameters begin in 2005 through 2020. The 2020 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 Rocky Creek Physical Water Quality (Field)

Rocky Creek (Upper Segment)								
Date	**Depth (m)**	**Temp (°C)**	**pH**	**DO (mg/L)**	**DO (% Sat)**	**Cond (UMHO/cm**	**Salinity (PPT)**	**Secchi Depth (m)**
1/30/20	0.2	16.2	7.4	6.46	65.4	207	0.09	1.4
Mean POR		23.5	6.9	4.11	48.6	182	0.09	0.43

The chemical water quality analysis for Rocky Creek is shown in Table 6 along with mean values for the period of record for available parameters. Period of record mean and the previous 3-year geometric mean values for Total Phosphorous values were below the nutrient region threshold developed by FDEP of 0.49 mg/L with a mean value of 0.067 mg/L (2005-2020). The three year geometric mean value for Total Phosphorous was 0.090 mg/L. Total Phosphorous values for the sample from this assessment were 0.084 mg/L. Total Nitrogen values were below the nutrient region threshold developed by FDEP of 1.65 mg/L with a mean value of 1.008 mg/L for the period of record (2005-2020). The three year geometric mean value for Total Nitrogen was 0.936 mg/L. The Total Nitrogen value from the assessment was below the threshold with a concentration of 0.9761 mg/L. Chlorophyll-a corrected values fall within the site specific evaluation range of 3.2 µg/l to 20 µg/l for the period of record (5.90 µg/l 2005-2020), and in the site specific evaluation range for the most recent 3-years of samples (5.28 µg/l) . For sites with Chlorophyll-a values in this range, the assessment is inconclusive of conditions reflecting an inbalance in flora.

Slightly elevated biomass of the bacterial parameters was observed in the long term dataset with E. Coli having a geomean of 47 colonies/100 ml, 104/100 ml for Enterococci.

Table 6 Rocky Creek Water Quality (Laboratory)

Parameter	Rocky Creek	POR Mean	Units
Alkalinity	29.9	44.6	mg/LCaCO3
Color(345)F.45	120	92.7	Pt/Co
E. Coli	119	47.1	#/100 ml
Enterococci	24.9	104.2	#/100 ml
Chlorophyll a	2.8	8.8	ug/L
Chlorophyll b	< 1	1.1	ug/L
Chlorophyll c	< 1	0.8	ug/L
Chlorophyll t	3.9		ug/L
Chlorophylla Corr	1.2	5.9	ug/L
Chlorophyll-pheo	2.7		ug/L
Ammonia	0.033	0.039	mg/L
Kjeldahl Nitrogen	0.933	1.066	mg/L
Total Nitrogen	0.976	1.008	mg/L
Nitrates/Nitrites	0.043	0.016	mg/L
Total Phosphorus	0.084	0.067	mg/L

Conclusion

Rocky Creek Upper Segment is located in a predominantly natural area surrounded by residential area. 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 112. Disruption to the vegetation community was not observed in the results of the Linear Vegetation Survey with Rocky Creek meeting both metrics for Average Coefficient of Conservatism and the Percent FLEPPC. Rocky 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 Rocky Creek showed acceptable concentrations of Chlorophyll-a, Total Phosphorous and Total Nitrogen in the long term dataset. 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		Rocky Creek	3-Year Mean	Threshold
Total Phosphorous (mg/l)		0.084	0.067	< 0.49
Total Nitrogen (mg/l)		0.976	0.880	< 1.65
RPS (% Rank 4-6)		0%		< 25%
LVS	**Avg C of C**	3.86		≥ 2.5
	FLEPPC %	20%		< 25%
Chlorophyll (µg/l)		1.2	5.28	< 20 µg/l
Habitat Assessment		112		> 34
SCI		65		> 34