English Creek

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

David Eilers | USF Water Institute | May 10, 2021

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, 2017 Land Use/ Land Cover (LULC) and Waterbody ID (WBID) layers courtesy of the Florida Department of Environmental Protection (FDEP). The Landscape Development Intensity Index (LDI) was calculated for the WBID containing the stream. From FDEP (https://floridadep.gov/dear/bioassessment/content/bioassessment-ldi-hdg-bcg) "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 FDEP 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 FDEP 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 (LVS). 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 Table LVI 1000-1 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 in FDEP LVI 1000-1.

STREAM CONDITION INDEX ASSESSMENT

The Stream Condition Index (SCI) was sampled and calculated per DEP SOP SCI 1000. 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 SCI 1000, the SCI scores greater than 35 are considered healthy. Proposed biological health assessment criteria state that a WBID is considered to meet designated uses if the average of the two most recent SCI scores is 40 or higher and neither of the most recent 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 Hillsborough County Public Utilities 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. Results will be discussed in the Florida Department of Environmental Protection's Numeric Nutrient Criteria framework and combined with the monthly sampling from the Hillsborough County Environmental Protection Commission Monthly sampling data.

Study Area

English Creek is located in northern eastern Hillsborough County in the Hillsborough Bay Watershed. Its headwaters are located northwest of Highway 92 and Charlie Taylor Road. The outfall of English Creek is in Howell Branch Creek. The assessment of English Creek was conducted on May 10, 2021. At the time of the assessment, the water levels were normal for the dry season. The English Creek WBID covers 12.55 square miles and is dominated by residential (25.5%), agricultural (23.4%) and natural (21.9%) land uses. The resulting calculated landscape development intensity index score was 4.92.

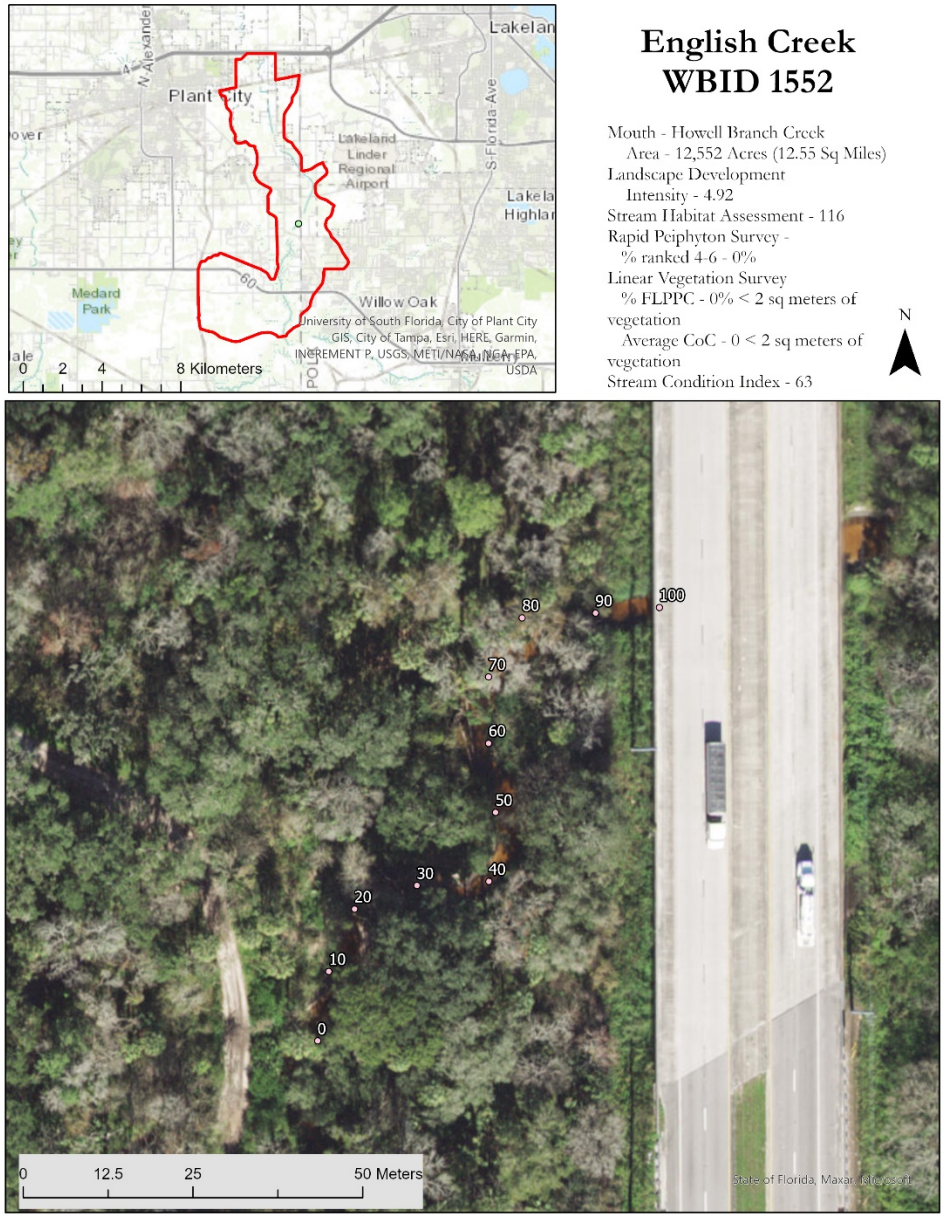

Figure 1 2021 English Creek Study Area Map

Figure 2 Overview photograph of the English Creek Sample Site showing the typical habitat features

Habitat and Vegetation Assessment

The region of English Creek where the assessment was conducted is in a natural region downstream from the County Line Road Bridge. The region was heavily shaded with a mean canopy cover measurement of 81.2%. English Creek averaged 0.25 meters in depth, approximately 3.72 meters wide with a flow of 0.29 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 (0.29 m/s). Habitat Smothering (sufficient pools but many of the productive habitats were affected by sand smothering) scored as suboptimal. Substrate Diversity (Presence of two major productive habitats (snags, roots)) and Substrate Availability (7.8% of stream are productive habitats) were scored as marginal. Minor habitats included leaf packs/mats and sand and silt deposits. The total score for the primary habitat components was a 47 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 Bank Stability (both banks with few raw eroded areas), Artificial Channelization and Riparian Buffer Zone Width (greater than 18 meters of buffer). Riparian Zone Vegetation Quality (both banks showing moderate levels of disturbance shown in the species present) scored in the suboptimal category. The secondary habitat components received a score of 69 out of 80. The resulting FDEP Habitat Assessment score was a 116.

Table 1 Scoring Summary for the Stream Habitat Assessment

Metric	Score
Primary Habitat Components	
Substrate Diversity	9
Substrate Availability	8
Water Velocity	18
Habitat Smothering	12
Primary Score	**47**
Secondary Habitat Components	
Artificial Channelization	17
Bank Stability - Right Bank	9
Bank Stability - Left Bank	9
Riparian Buffer Zone Width - Right Bank	9
Riparian Buffer Zone Width - Left Bank	9
Riparian Zone Vegetation Quality - Right Bank	8
Riparian Zone Vegetation Quality - Left Bank	8
Secondary Score	**69**
Habitat Assessment Score	**116**

Periphyton was not encountered during the 99 samples taken during the Rapid Periphyton Survey. The tree canopy in the assessment area averaged 81.2% reducing available light for periphyton to flourish.

The FDEP Linear Vegetation Survey encountered less than 2 m^2 of herbaceous species rooted in English Creek at the time of the assessment. The vegetation surrounding the creek was dominated by a mixture of native and invasive species.

Table 1 Linear Vegetation Survey Results – English 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	
Less than 2m^2												

Figure 3 Snags and fine roots were the most abundant major productive habitat in English 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 English Creek was 63 out of a possible 100 points, corresponding with a "Category 2 Healthy" designation, with minor loss of taxonomic diversity from the expected community of an exceptional stream. Both subsamples contained many total taxa with 33 taxa in subsample A and 33 in subsample B. The most recent previous SCI sample was collected in 5/10/2016 with a score of 61.

High scores (scores above 7.0) were achieved for the Total Taxa, Total Clingers, % Dominance in both subsamples. In addition, Total Trichoptera scored high in Sample B. Low scores (less than 3.0) were achieved for the Total Ephemeroptera and Total Long Lived Taxa in Sample B. The full results of the SCI sampling are shown in Table 3 (Sample A) and Table 4 (Sample B) for English Creek.

Table 2 SCI metric summaries for English Creek

SCI Metric	Raw Totals	SCI scores	Adjusted SCI scores
Total Taxa	33.00	7.50	7.50
Total Ephemeroptera	3.00	6.00	6.00
Total Trichoptera	4.00	5.71	5.71
% Filter Feeders	17.86	3.99	3.99
Total Clingers	6.00	8.57	8.57
Total Long-lived Taxa	2.00	6.67	6.67
% Dominance	25.00	7.80	7.80
% Tanytarsini	7.14	6.17	6.17
Total Sensitive Taxa	4.00	5.71	5.71
% Very Tolerant Individuals	22.14	3.90	3.90

SCI Sum	62.02
Final SCI score	68.91

SCI Metric	Raw Totals	SCI scores	Adjusted SCI scores
Total Taxa	33.00	7.50	7.50
Total Ephemeroptera	1.00	2.00	2.00
Total Trichoptera	5.00	7.14	7.14
% Filter Feeders	18.75	4.20	4.20
Total Clingers	5.00	7.14	7.14
Total Long-lived Taxa	0.00	0.00	0.00
% Dominance	27.63	7.27	7.27
% Tanytarsini	8.55	6.64	6.64
Total Sensitive Taxa	3.00	4.29	4.29
% Very Tolerant Individuals	11.18	5.50	5.50

SCI Sum	51.68
Final SCI score	57.42

Table 3 SCI full results for Sample A

Stream Condition Index Results for English Creek SCIA

Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Abundance	Collapsed Abundance	Taxa Presence	Ephemeroptera Taxa	Trichoptera Taxa	50% Filterer	100% Filterer	Clinger Taxa	Long-lived Taxa	Dominant Taxa	Tanytarsini	Sensitive Taxa	Very Tolerant Individuals	Specimen Notes
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	Tubificinae spp.	2	2	1	0	0	0	0	0	0		0	0	0	Damaged and/or immature, not B. sowerbyi
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	*Branchiura sowerbyi*	1	1	1	0	0	0	0	0	0		0	0	0	
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	*Nais pardalis*	1	1	1	0	0	0	0	0	0		0	0	1	
Mollusca		Gastropoda				Gastropoda spp.	1		0	0	0	0	0	0	0		0	0	0	Damaged, no shell
Mollusca		Gastropoda	Caenogastropoda	Littorinimorpha	Hydrobiidae	*Pyrgophorus platyrachis*	26	27	1	0	0	0	0	0	0		0	0	27	
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Ancylidae	Ancylidae spp.	1	1	1	0	0	0	0	0	0		0	0	0	Damaged, no shell
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Physidae	*Physa acuta*	1	1	1	0	0	0	0	0	0		0	0	1	
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Planorbidae	*Menetus dilatatus*	2	2	1	0	0	0	0	0	0		0	0	2	
Mollusca		Bivalvia	Autobranchia	Venerida	Cyrenidae	*Corbicula* spp.	2	2	1	0	0	0	2	0	1		0	0	0	Oversized jar
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda		Senticaudata spp.	1		0	0	0	0	0	0	0		0	0	0	Head only; like Hyalella
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyalellidae	*Hyalella azteca* sp. complex	1	2	1	0	0	0	0	0	0		0	0	0	Max1 dissected; not H. wakulla
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Palaemonidae	*Palaemon* spp.	3	3	1	0	0	0	0	0	1		0	0	0	No mature males
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	*Labiobaetis propinquus*	2	2	1	1	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	*Baetis intercalaris*	3	3	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	No 7th gill
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Gomphidae	Gomphidae spp.	1	1	1	0	0	0	0	0	0		0	0	0	Early instar
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Corduliidae	*Neurocordulia alabamensis*	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Leptoceridae	*Nectopsyche* spp.	1	1	1	0	1	0	0	0	0		0	0	0	Early instar
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	*Cheumatopsyche* spp.	17	17	1	0	1	0	17	1	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydroptilidae	*Hydroptila* spp.	9	9	1	0	1	0	0	1	0		0	0	0	Larvae = 6, Pupae = 3
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydroptilidae	*Neotrichia* spp.	3	3	1	0	1	0	0	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	Adult = 1
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Stenelmis* spp.	1	1	1	0	0	0	0	1	0		0	0	0	Adult = 1
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Microcylloepus* spp.	35	35	1	0	0	0	0	0	0		0	0	0	Larvae = 18, Adults = 17
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Chironomidae spp.	2		0	0	0	0	0	0	0		0	0	0	Pupae = 2
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus* spp.	6	7	1	0	0	3.5	0	0	0		7	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum flavum*	4	5	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Rheotanytarsus* spp.	2	2	1	0	0	0	2	1	0		2	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Ablabesmyia mallochi*	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	*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	Diptera	Chironomidae	*Rheocricotopus robacki*	2	2	1	0	0	0	0	0	0		0	1	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Ceratopogonidae	*Bezzia/Palpomyia* spp.	1	1	1	0	0	0	0	0	0		0	0	0	Larva = 1
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Empididae	*Hemerodromia* spp.	1	1	1	0	0	0	0	0	0		0	1	0	Larva = 1
Arthropoda	Chelicerata	Arachnida	Acari	Trombidiformes	Lebertiidae	*Lebertia* spp.	1	1	1	0	0	0	0	0	0		0	1	0	

Table 4 SCI full results for Sample B

Stream Condition Index Results for English Creek SCIB

Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Abundance	Collapsed Abundance	Taxa Presence	Ephemeroptera Taxa	Trichoptera Taxa	50% Filterer	100% Filterer	Clinger Taxa	Long-lived Taxa	Dominant Taxa	Tanytarsini	Sensitive Taxa	Very Tolerant Individuals	Specimen Notes
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	Tubificinae spp.	5	5	1	0	0	0	0	0	0		0	0	0	Damaged and/or immature, not B. sowerbyi
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	*Branchiura sowerbyi*	1	1	1	0	0	0	0	0	0		0	0	0	
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	*Nais pardalis*	1	1	1	0	0	0	0	0	0		0	0	1	
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	*Stylaria fossularis*	3	3	1	0	0	0	0	0	0		0	0	0	
Annelida		Clitellata	Oligochaeta	Lumbriculida	Lumbriculidae	*Eclipidrilus palustris*	1	1	1	0	0	0	0	0	0		0	0	0	
Annelida		Clitellata	Oligochaeta	Lumbriculida	Lumbriculidae	*Lumbriculus* cf. *variegatus*	1	1	1	0	0	0	0	0	0		0	0	1	
Mollusca		Gastropoda				Gastropoda spp.	1	1	1	0	0	0	0	0	0		0	0	0	Damaged, immature, probably Physa acuta
Mollusca		Gastropoda	Caenogastropoda	Littorinimorpha	Hydrobiidae	*Pyrgophorus platyrachis*	14	14	1	0	0	0	0	0	0		0	0	14	
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Planorbidae	Planorbidae spp.	1	1	1	0	0	0	0	0	0		0	0	1	Damaged, immature
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Hyalellidae	*Hyalella azteca* sp. complex	2	2	1	0	0	0	0	0	0		0	0	0	Max1 dissected; damaged/not H. wakulla
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	*Labiobaetis propinquus*	1	1	1	1	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Coenagrionidae	Coenagrionidae spp.	1	1	1	0	0	0	0	0	0		0	0	0	Early instar - no caudal lamellae
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Leptoceridae	*Nectopsyche* spp.	1	1	1	0	1	0	0	0	0		0	0	0	Early instar; like N. pavida
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Leptoceridae	*Nectopsyche candida/exquisita*	3	3	1	0	1	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	Hydropsychidae spp.	3		0	0	0	0	0	0	0		0	0	0	Damaged - like Cheumatopsyche
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	*Cheumatopsyche* spp.	17	20	1	0	1	0	20	1	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydroptilidae	Hydroptilidae spp.	1		0	0	0	0	0	0	0		0	0	0	P = 1
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydroptilidae	*Hydroptila* spp.	3	4	1	0	1	0	0	1	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydroptilidae	*Neotrichia* spp.	3	3	1	0	1	0	0	1	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Dubiraphia* spp.	9	9	1	0	0	0	0	0	0		0	0	0	L = 2, A = 7
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Stenelmis* spp.	1	1	1	0	0	0	0	1	0		0	0	0	A = 1
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Microcylloepus* spp.	42	42	1	0	0	0	0	0	0		0	0	0	L = 18, A = 24
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera		Diptera spp.	1		0	0	0	0	0	0	0		0	0	0	P = 1, damaged
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Chironomidae spp.	1		0	0	0	0	0	0	0		0	0	0	P = 1
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus* spp.	9	9	1	0	0	4.5	0	0	0		9	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum flavum*	10	12	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Rheotanytarsus* spp.	4	4	1	0	0	0	4	1	0		4	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Ablabesmyia mallochi*	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	*Rheocricotopus robacki*	1	1	1	0	0	0	0	0	0		0	1	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Kribiodorum perpulchrum*	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	L =1
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Empididae	*Hemerodromia* spp.	2	2	1	0	0	0	0	0	0		0	1	0	L = 1, P =1
Arthropoda	Hexapoda	Insecta	Pterygota	Heteroptera	Veliidae	*Rhagovelia* spp.	2	2	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Chelicerata	Arachnida	Acari	Trombidiformes	Lebertiidae	*Lebertia* spp.	1	1	1	0	0	0	0	0	0		0	1	0	
Arthropoda	Chelicerata	Arachnida	Acari	Trombidiformes	Hygrobatidae	*Hygrobates* spp.	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Chelicerata	Arachnida	Acari	Sarcoptiformes		Oribatida spp.	1	1	1	0	0	0	0	0	0		0	0	0	

Water Quality Assessment

Long-term water quality data is available for English Creek. The data that is available was collected by the Hillsborough County Environmental Protection Commission, Polk County Natural Resources. Values for the physical water parameters begin in 2010 and continue through 2021. Values for the laboratory water parameters begin in 2010 through 2021. The 2021 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 English Creek Physical Water Quality (Field)

English Creek								
Date	**Depth (m)**	**Temp (°C)**	**pH**	**DO (mg/L)**	**DO (% Sat)**	**Cond (UMHO/cm)**	**Salinity (PPT)**	**Secchi Depth (m)**
5/10/2021	0.3	22.64	7.63	8.39	96.2	281.2	0.13	0.3 VOB
Mean POR	0.25	22.61	7.26	6.85	77.96	353.5	0.16	0.27

The chemical water quality analysis for English Creek is shown in Table 6 along with mean values for the period of record for available parameters. The previous 3-year geometric mean values for Total Phosphorous values were above the nutrient region threshold developed by FDEP of 0.49 mg/L with a geometric mean value of 1.267 mg/L (2019-2021) (1.523 mg/L (2019), 2.201 mg/L (2020) and 0.859 mg/L (2021)). Total Phosphorous values for the sample from this assessment were 3.000 mg/L. Total Nitrogen values were above the nutrient region threshold developed by FDEP of 1.65 mg/L for the previous three year period with a mean value of 2.470 mg/L (2019-2021) (2.633 mg/L (2019), 2.240 mg/L (2020) and 2.553 mg/L (2021)). The Total Nitrogen value from the assessment was above the threshold with a concentration of 2.220 mg/L. Chlorophyll-a corrected values fall below the site specific evaluation range of 3.2 µg/l to 20 µg/l for the most recent 3-years of samples with a 3-year geometric mean of 2.64 µg/l (2019-2021) (2.52 µg/l in 2019, 3.99 µg/l in 2020, 2.15 µg/l in 2021). For sites with Chlorophyll-a values in this range, the assessment is indicating conditions reflecting a balance in flora.
A highly elevated biomass of the bacterial parameters was observed in the 3-year dataset with E. Coli having a geometric mean of 1,005.9 colonies/100 ml, 2,614.4/100 ml for Enterococci.

Table 6 English Creek Water Quality (Laboratory)

Parameter	English Creek 5/10/2021	POR Mean (1989-2021)	Units
Alkalinity	121	130.4	mg/LCaCO3
Color(345)F.45	50	22.4	Pt/Co
E. Coli	1,840	1,005.9	#/100 ml
Enterococci	649	2,614.4	#/100 ml
Chlorophyll a	1.8	3.24	ug/L
Chlorophyll b	1.3	0.45	ug/L
Chlorophyll c	1.3	0.76	ug/L
Chlorophyll t	1.8	1.71	ug/L
Chlorophylla Corr	1.3	2.64	ug/L
Chlorophyll-pheo	3.2	2.75	ug/L
Ammonia	< 0.073	0.034	mg/L
Kjeldahl Nitrogen	0.664	0.712	mg/L
Total Nitrogen	2.220	2.470	mg/L
Nitrates/Nitrites	1.560	1.492	mg/L
Total Phosphorus	3.000	1.267	mg/L

Conclusion

English Creek at Countyline Road is located in a predominantly natural 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 suboptimal score of 116. Disruption to the vegetation community was not observed in the results of the Linear Vegetation Survey with English Creek having below 2 square meters of rooted herbaceous vegetation. English Creek did meet standards for the rapid periphyton survey with 0% of samples being ranked between 4 and 6 due to the heavy canopy coverage in the region. The recent water quality record for English Creek showed elevated concentrations of Total Phosphorous and Total Nitrogen above the FDEP thresholds but the Chlorophyll-a corrected values were below the FDEP thresholds. 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		English Creek	2019	2020	2021	Threshold
Total Phosphorous (mg/l)		3.000	1.523	2.201	0.859	< 0.49
Total Nitrogen (mg/l)		2.220	2.633	2.240	2.553	< 1.65
RPS (% Rank 4-6)		0				< 25%
LVS	**Avg C of C**	N/A				≥ 2.5
	FLEPPC %	N/A				< 25%
Chlorophyll-a Corrected (µg/l)		1.3	2.52	3.99	2.15	< 20 µg/l
Habitat Assessment		116				> 34
SCI		63				> 34