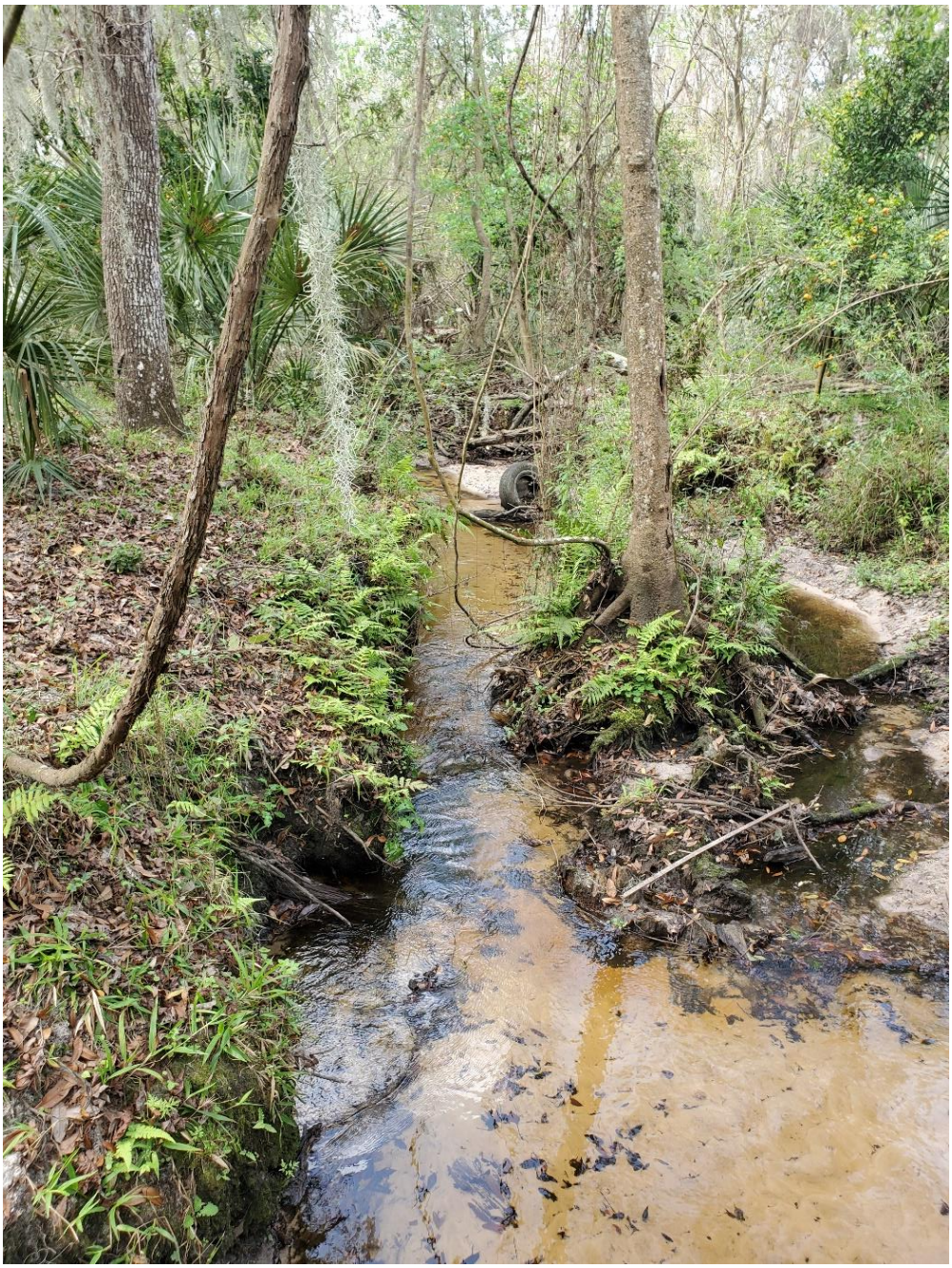


Owens Branch

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

David Eilers, Bailey Cooper | USF Water Institute | February 18, 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

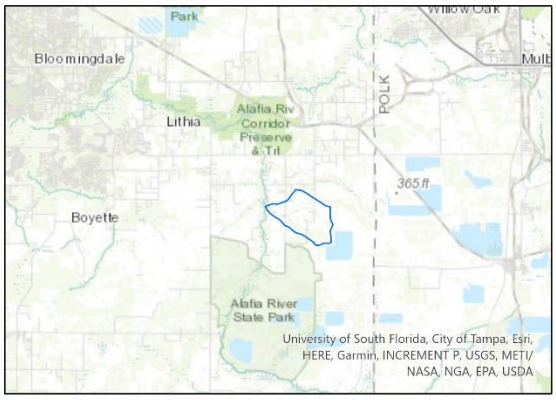
The Stream Condition Index (SCI) was sampled per DEP SOP FS7420 and calculated per DEP SOP LT7200. The SCI consists of collecting macroinvertebrates via 20 D-frame dipnet sweeps (0.5 m in length) in the most productive habitats in a 100 m reach of stream. The organisms are sub-sampled, and identified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

Owens Branch is located in south-eastern Hillsborough County. Its headwaters are located east of Keysville Road and the outfall of Owens Branch is in Alafia River South Prong. The assessment of Owens Branch was conducted on February 18, 2020 east of Walter Hunter Road. At the time of the assessment, the water levels were normal for the end of the dry season. The Owens Branch WBID covers 3.77 square miles and is dominated by natural (41.68%) and agricultural (35.0%) land uses. The resulting calculated landscape development intensity index score was 4.43.



Owens Branch
WBID 1675

Mouth - Alafia River South Prong
Area - 1,541 Acres (3.77 Sq Miles)
Landscape Development Intensity - 4. 43
Stream Habitat Assessment - 116
Rapid Peiphyton Survey - % ranked 4-6 - 0%
Linear Vegetation Survey - < 2m^2 % FLPPC - 60%
Average CoC - 1.52
Stream Condition Index - 58

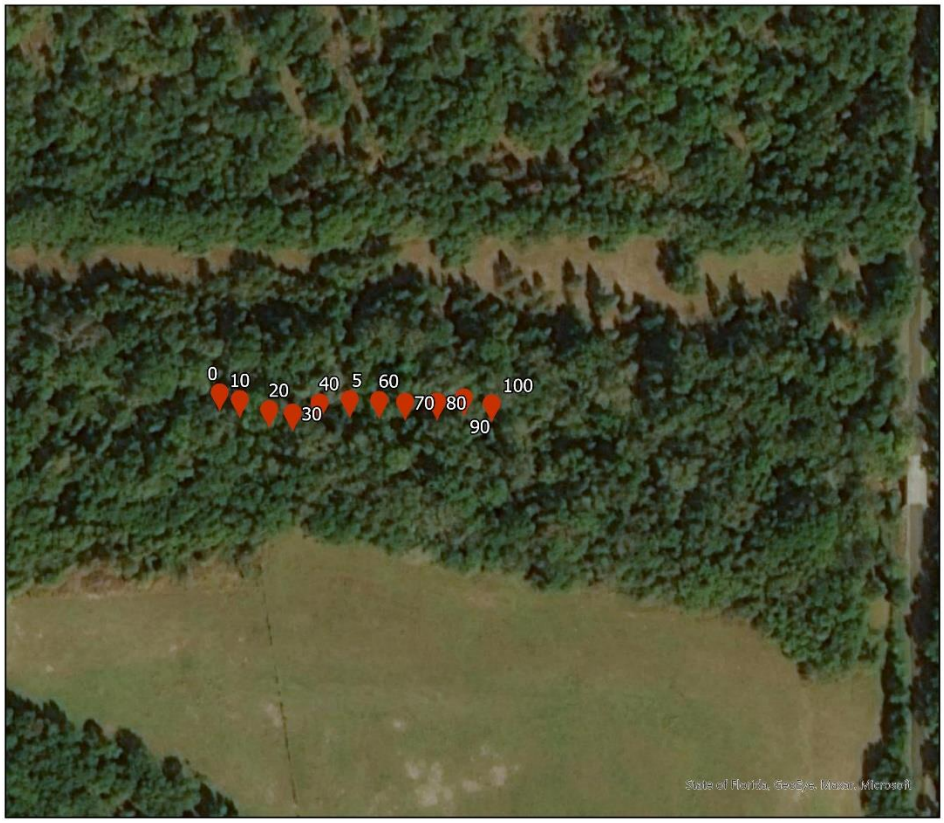


Figure 1 2020 Owens Branch Study Area Map

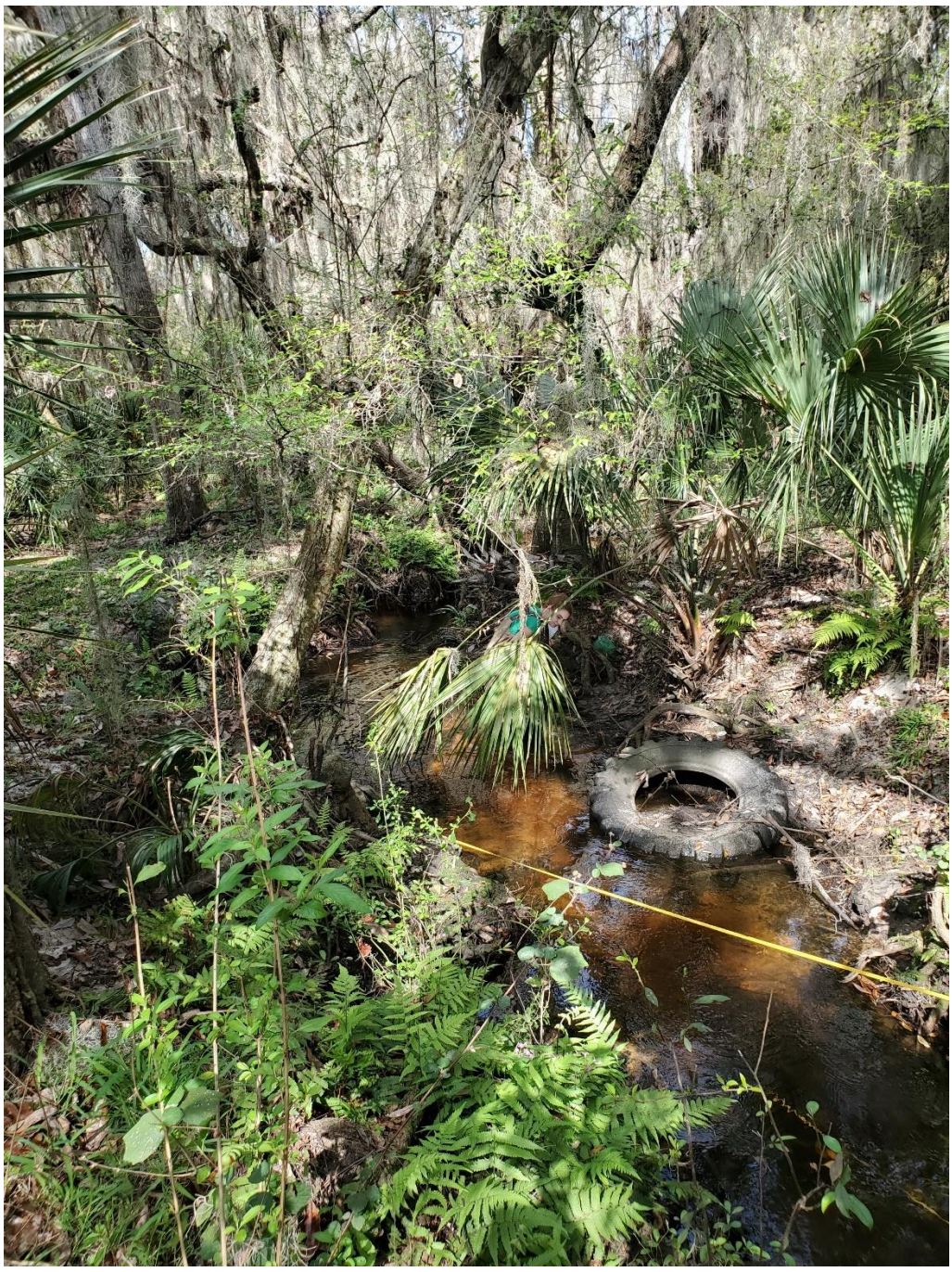


Figure 2 Overview photograph of the Owens Branch Sample Site

Habitat and Vegetation Assessment

The region of Owens Branch where the assessment was conducted is in a natural area adjacent to pasture land. The region was heavily shaded with a mean canopy cover measurement of 91.1%. Owens Branch averaged 0.1 meters in depth, approximately 2.0 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 Habitat Smothering (few of the productive habitats were affected by sand smothering) and Water Velocity. Marginal scores were noted for Substrate Diversity (Presence of two major productive habitats (snags, roots)). Substrate Availability (4.0% of stream are productive habitats) was scored as poor. Minor habitats included leaf packs/mats, sand and silt deposits. The total score for the primary habitat components was a 45 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 Artificial Channelization, Bank Stability and Riparian Buffer Zone Width. Riparian Zone Vegetation Quality scored in the suboptimal category for the right bank due to several non-native invasive species. The riparian buffer zone surrounding the stream was greater than 18 meters and consisted of a mixture of native and invasive species indicative of disturbance. The vegetation in the stream itself was sparse with less than 1 square meter of vegetation between three species, one of which is non-native to this region of Florida. The secondary habitat components received a score of 71 out of 80. The resulting FDEP Habitat Assessment score was a 116.

Periphyton was not encountered during the 99 samples taken during the Rapid Periphyton Survey. The tree canopy in the assessment area averaged 91.1% limiting available sunlight for macrophytes and algae.

The FDEP Linear Vegetation Survey encountered less than 2 square meters of herbaceous species in Owens Branch between three species. *Alternanthera philoxeroides* is a non-native invasive species. The other two observed species were *Hydrocotyle* and *Micranthemum umbrosum*, both native species.

Table 1 Linear Vegetation Survey Results – Owens Branch

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	
Alternanthera philoxeroides	0	1	1		1							3
Hydrocotyle umbellata	1.92	1										1
Micranthemum umbrosum	5.66	1										1

Figure 3 Fine root and snag habitat in Owens Branch.

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 Owens Branch was 58 out of a possible 100 points, corresponding with a "Healthy" designation, with the expected community of a healthy stream.

The two samples varied in species composition. In Sample A, high scores were achieved for the % Tanytarsini, % Very Tolerant Individuals and % Filter Feeders metrics. Sample B had high scores for Total Clingers, % Dominance and % Very Tolerant Individuals. 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 Owens Branch.

Table 2 SCI metric summaries for Owens Branch Sample A (top) and Sample B (Bottom)

SCI Metric	Raw Totals	SCI scores	Adjusted SCI scores
Total Taxa	25.00	4.17	4.17
Total Ephemeroptera	2.00	4.00	4.00
Total Trichoptera	2.00	2.86	2.86
% Filter Feeders	36.42	8.31	8.31
Total Clingers	3.00	4.29	4.29
Total Long-lived Taxa	1.00	3.33	3.33
% Dominance	31.13	6.57	6.57
% Tanytarsini	18.54	8.74	8.74
Total Sensitive Taxa	3.00	4.29	4.29
% Very Tolerant Individuals	3.31	8.10	8.10

SCI Sum	54.65
Final SCI score	60.72

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	3.77	0.71	0.71
Total Clingers	5.00	7.14	7.14
Total Long-lived Taxa	1.00	3.33	3.33
% Dominance	23.90	8.02	8.02
% Tanytarsini	1.26	2.40	2.40
Total Sensitive Taxa	3.00	4.29	4.29
% Very Tolerant Individuals	1.26	9.71	9.71

SCI Sum	49.88
Final SCI score	55.42

Table 3 SCI full results for Sample A

Stream Condition Index Results for Owens Branch SCIA

Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Abundance	Collapsed	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	*Limnodrilus hoffmeisteri*	1	1	1	0	0	0	0	0	0		0	0	1	
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	*Nais communis*	1	1	1	0	0	0	0	0	0		0	0	1	Broken in 1/2
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	*Slavina appendiculata*	1	1	1	0	0	0	0	0	0		0	0	0	
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Ancylidae	Ancylidae spp.	7	7	1	0	0	0	0	0	0		0	0	0	Damaged
Mollusca		Bivalvia	Heterodonta	Veneroida	Corbiculidae	*Corbicula* spp.	1	1	1	0	0	0	1	0	1		0	0	0	
Arthropoda	Crustacea	Malacostrac	Eumalacostraca	Amphipoda	Dogielinotidae	*Hyalella azteca* sp. complex	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	*Labiobaetis propinquus*	3	3	1	1	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	*Acerpenna pygmaea*	1	1	1	1	0	0	0	0	0		0	1	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Coenagrionidae	Coenagrionidae spp.	1	1	1	0	0	0	0	0	0		0	0	0	Damaged, not Argia
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Coenagrionidae	*Argia* spp.	1	1	1	0	0	0	0	0	0		0	0	0	Damaged
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Leptoceridae	*Nectopsyche*	1	1	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	Immature
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	*Cheumatopsyche* spp.	10	13	1	0	1	0	13	1	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Microcylloepus* spp.	21	21	1	0	0	0	0	0	0		0	0	0	14 larvae, 7 adults
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Scirtidae	*Scirtes* spp.	1	1	1	0	0	0	0	0	0		0	0	0	1larva
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera		Diptera spp.	4		0	0	0	0	0	0	0		0	0	0	4 pupae
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Chironomidae spp.	2		0	0	0	0	0	0	0		0	0	0	2 pupae
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus buckleyi*	1	1	1	0	0	1	0	0	0		1	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum flavum*	43	47	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum illinoense* group	3	3	1	0	0	0	0	0	0		0	0	3	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Rheotanytarsus exiguus*	25	27	1	0	0	0	27	1	0		27	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	*Thienemanniella xena*	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	Ceratopogonidae	*Bezzia/Palpomyia* spp.	1	1	1	0	0	0	0	0	0		0	0	0	1larva
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Simuliidae	*Simulium* spp.	13	13	1	0	0	0	13	1	0		0	1	0	12 larvae, 1pupa
Arthropoda	Chelicerata	Arachnida	Acari	Trombidiformes	Sperchonidae	*Sperchon* spp.	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Chelicerata	Arachnida	Acari	Trombidiformes	Hygrobatidae	*Hygrobates* spp.	1	1	1	0	0	0	0	0	0		0	0	0	

Table 4 SCI full results for Sample B

Stream Condition Index Results for Owens Branch SCIB

Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Abundance	Collapsed Abundanc	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	Lumbriculida	Lumbriculidae	*Eclipidrilus lacustris*	1	1	1	0	0	0	0	0	0		0	0	0	
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Ancylidae	Ancylidae spp.	4	4	1	0	0	0	0	0	0		0	0	0	Damaged, no shell
Mollusca		Bivalvia	Heterodonta	Veneroida	Corbiculidae	*Corbicula* spp.	2	2	1	0	0	0	1	0	1		0	0	0	
Mollusca		Bivalvia	Heterodonta	Veneroida	Sphaeriidae	Sphaeriidae spp.	1	1	1	0	0	0	1	0	0		0	0	0	Damaged and immature
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Caenidae	*Caenis diminuta*	1	1	1	1	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	Baetidae spp.	1		0	0	0	0	0	0	0		0	0	0	Damaged
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	*Labiobaetis propinquus*	2	3	1	1	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	*Acerpenna pygmaea*	1	1	1	1	0	0	0	0	0		0	1	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Coenagrionidae	*Argia* spp.	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Calopterygidae	*Calopteryx dimidiata*	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Aeshnidae	Aeshnidae spp.	1	1	1	0	0	0	0	0	0		0	0	0	Immature
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	Hydropsychidae spp.	4		0	0	0	0	0	0	0		0	0	0	Immature
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	*Cheumatopsyche* spp.	9	13	1	0	1	0	1	1	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydroptilidae	*Neotrichia* spp.	1	1	1	0	1	0	0	1	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Stenelmis* spp.	1	1	1	0	0	0	0	1	0		0	0	0	1adult
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Microcylloepus* spp.	22	22	1	0	0	0	0	0	0		0	0	0	15 larvae, 7 adults
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Chironomidae spp.	2		0	0	0	0	0	0	0		0	0	0	2 pupae
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus buckleyi*	2	2	1	0	0	1	0	0	0		1	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum halterale* group	1	1	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum flavum*	37	38	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*	32	33	1	0	0	0	1	1	0		1	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Pentaneura inconspicua*	3	3	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Stenochironomus* spp.	2	2	1	0	0	0	0	0	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Larsia* spp.	2	2	1	0	0	0	0	0	0		0	0	1	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Thienemanniella* spp.	2	2	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	Chironomidae	*Rheocricotopus robacki*	1	1	1	0	0	0	0	0	0		0	1	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Simuliidae	*Simulium* spp.	17	17	1	0	0	0	1	1	0		0	1	0	16 larvae, 1pupa
Arthropoda	Chelicerata	Arachnida	Acari	Trombidiformes	Sperchonidae	*Sperchon* spp.	1	1	1	0	0	0	0	0	0		0	0	0	Damaged

Water Quality Assessment

Long-term water quality data is available for Owens Branch. The data that is available was collected by the Hillsborough County Environmental Protection Commission (2005- 2020) and Florida Department of Environmental Protection (1992-2020). 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 Owens Branch Physical Water Quality (Field)

Owens Branch								
Date	**Depth (m)**	**Temp (°C)**	**pH**	**DO (mg/L)**	**DO (% Sat)**	**Cond (UMHO/cm**	**Salinity (PPT)**	**Secchi Depth (m)**
2/13/20	0.11	21.46	7.04	7.79	87.3	166.5	0.08	1.1
Mean POR		21.54	7.08	7.50	83.29	172.8	0.11	0.65

The chemical water quality analysis for Owens Branch 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 above the nutrient region threshold developed by FDEP of 0.49 mg/L with a mean value of 0.0.544 mg/L (1992-2020). The three year geometric mean value for Total Phosphorous was 0.0.587 mg/L. Total Phosphorous values for the sample from this assessment were 0.510 mg/L. Total Nitrogen values were above the nutrient region threshold developed by FDEP of 1.65 mg/L with a mean value of 2.495 mg/L for the period of record (1992-2020). The three year geometric mean value for Total Nitrogen was 1.692 mg/L. The Total Nitrogen value from the assessment was below the threshold with a concentration of 1.580 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 (1.50 µg/l 2005-2019), and for the most recent 3-years of samples (2.24 µg/l) . For sites with Chlorophyll-a values in this range, the assessment indicative of conditions reflecting a balance in flora.
Elevated biomass of the bacterial parameters was observed in the long term dataset with E. Coli having a geomean of 2,102 colonies/100 ml, 3,635/100 ml for Enterococci.

Table 6 Owens Branch Water Quality (Laboratory)

Parameter	Owens Branch	POR Mean	Units
Alkalinity		27.4	mg/LCaCO3
Color(345)F.45	60	65.2	Pt/Co
E. Coli	4,480	2,102	#/100 ml
Enterococci	866	3,635	#/100 ml
Chlorophyll a	1.9	1.6	ug/L
Chlorophyll b	<1	0.6	ug/L
Chlorophyll c	1.4	0.4	ug/L
Chlorophyll t			ug/L
Chlorophylla Corr	1.1	1.50	ug/L
Chlorophyll-pheo	1.4		ug/L
Ammonia	0.052	0.010	mg/L
Kjeldahl Nitrogen	0.980	0.838	mg/L
Total Nitrogen	1.580	2.495	mg/L
Nitrates/Nitrites	0.604	1.422	mg/L
Total Phosphorus	0.510	0.544	mg/L

Conclusion

Owens Branch is located in a mixture of agricultural and natural area land uses. 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. Less than 2 square meters of herbaceous aquatic vegetation was observed during the Linear Vegetation. Little Owens Branch did meet standards for the rapid periphyton survey with 0% of samples being ranked between 4 and 6. The historical water quality record for Owens Branch showed elevated concentrations of Total Phosphorous and Total Nitrogen in the long term dataset as well as the previous 3-year data. 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		Owens Branch	3- Year Mean	Threshold
Total Phosphorous (mg/l)		0.510	0.587	< 0.49
Total Nitrogen (mg/l)		1.580	2.495	< 1.65
RPS (% Rank 4-6)		0%		< 25%
LVS	**Avg C of C**	<2m^2		≥ 2.5
	FLEPPC %	<2m^2		< 25%
Chlorophyll (µg/l)		1.1	2.24	< 20 µg/l
Habitat Assessment		116		> 39
SCI		58		> 34