



Little Alafia River below Medard Reservoir

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

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Methods

STUDY AREA ANALYSIS

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/ulist.html>

STREAM CONDITION INDEX ASSESSMENT

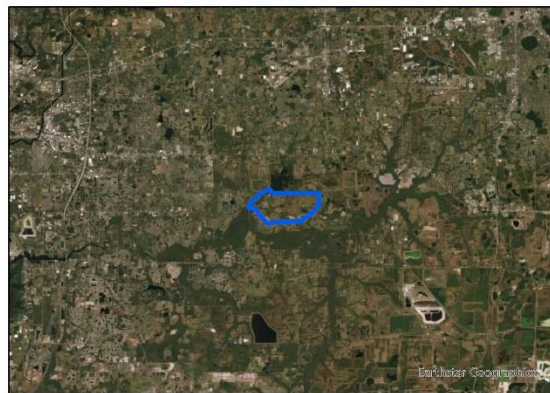
The Stream Condition Index (SCI) was sampled per DEP SOP FS7420 and calculated per DEP SOP LT7200. The SCI consists of collecting macroinvertebrates via 20 D-frame dipnet sweeps (0.5 m in length) in the most productive habitats in a 100 m reach of stream. The organisms are sub-sampled, and identified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

Little Alafia River below Medard Reservoir is located in eastern Hillsborough County. Its headwaters is the outfall of the Medard Reservoir in Plant City and the outfall of Little Alafia River is in Turkey Creek. The assessment of Little Alafia River was conducted on January 29, 2020. At the time of the assessment, the water levels were low, normal for the end of the dry season. The Little Alafia River below Medard Reservoir WBID covers 5.12 square miles and is dominated by pasture (26.3%), reclaimed (22.60%), residential (15.6%) and agricultural (11.8%) land uses. The resulting calculated landscape development intensity index score was 5.02.



Little Alafia River below Medard Reservoir WBID 1592

Mouth - Alafia River North Prong
Area - 3,016 Acres (5.12 Sq Miles)
Landscape Development
Intensity - 5.02
Stream Habitat Assessment - 85
Rapid Periphyton Survey -
% ranked 4-6 - 0%
Linear Vegetation Survey - < 2m²
% FLPPC - 100%
Average CoC - 0.202
Stream Condition Index - 57



Figure 1 2020 Little Alafia River below Medard Reservoir Study Area Map



Figure 2 Overview photograph of the Little Alafia River below Medard Reservoir Sample Site

Habitat and Vegetation Assessment

The region of Little Alafia River below Medard Reservoir where the assessment was conducted is in an agricultural and residential area. The region was moderately shaded with a mean canopy cover measurement of 66%. Little Alafia River below Medard Reservoir averaged 0.2 meters in depth, approximately 4.65 meters wide with a flow of 0.16 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 Habitat Smothering (many of the productive habitats were affected by sand smothering) and Water Velocity. Substrate Diversity (Presence of two major productive habitats (snags, rocks)) scored in the marginal category. Substrate Availability (2.4% of stream are productive habitats) was scored as poor. Minor habitats included roots, leaf packs/mats, aquatic macrophytes, sand and silt deposits. The total score for the primary habitat components was a 31 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 and Riparian Buffer Zone Width for the left bank. Bank Stability with many raw, eroded areas and Riparian Zone Vegetation Quality for the left bank and scored in the suboptimal category due to collapsing, steep banks and several non-native invasive species. Riparian buffer zone width and vegetation quality for the right bank were marginal. The riparian buffer zone surrounding the stream was greater than 18 meters on the left bank, with areas of the right bank having clearings for RV's, and consisted of a mixture of native and invasive species indicative of disturbance. The vegetation in the stream itself was dominated by non-native species with 6 non-native invasive species out of 6 total species. The secondary habitat components received a score of 54 out of 80. The resulting FDEP Habitat Assessment score was an 85.

Periphyton was not encountered during the 94 samples taken during the Rapid Periphyton Survey. The tree canopy in the assessment area averaged 66.0% limiting available sunlight for macrophytes and algae.

The FDEP Linear Vegetation Survey observed less than 2 square meters of herbaceous aquatic vegetation. A total of six species in Little Alafia River below Medard Reservoir were observed. *Hydrilla verticillata*, *Alternanthera philoxeroides*, *Panicum repens*, *Commelina diffusa*, *Colocasia esculenta* and *Pistia stratioides* are non-native invasive species.

Table 1 Linear Vegetation Survey Results – Little Alafia River below Medard Reservoir

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	
<i>Hydrilla verticillata</i>	0	1	1	1	1	1	1	1	1	1	1	10
<i>Alternanthera philoxeroides</i>	0					1			1		1	3
<i>Colocasia esculenta</i>	0							1	1	1		3
<i>Commelina diffusa</i>	2.02								1	1		2
<i>Panicum repens</i>	0										1	1
<i>Pistia stratiotes</i>	0					1						1



Figure 3 Eroded banks along Little Alafia River.

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 Little Alafia River was 57 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 % Filter Feeders in both samples. Sample A also had high scores for % Dominance and Sample B had high scores for % Tanytarsini. Low scores came from Total Trichoptera in both samples as well as Total Sensitive Taxa in Sample A. Table 2 shows the scoring summaries for both samples. Tables 3 and 4 contain the complete taxa lists for each sample.

Table 2 SCI metric summaries for Little Alafia River Sample A (top) and Sample B (bottom)

SCI Metric	Raw Totals	SCI scores	Adjusted SCI scores
Total Taxa	30.00	6.25	6.25
Total Ephemeroptera	2.00	4.00	4.00
Total Trichoptera	1.00	1.43	1.43
% Filter Feeders	34.19	7.79	7.79
Total Clingers	2.00	2.86	2.86
Total Long-lived Taxa	1.00	3.33	3.33
% Dominance	23.23	8.15	8.15
% Tanytarsini	16.77	8.46	8.46
Total Sensitive Taxa	1.00	1.43	1.43
% Very Tolerant Individuals	11.61	5.41	5.41

SCI Sum	49.12
Final SCI score	54.58

SCI Metric	Raw Totals	SCI scores	Adjusted SCI scores
Total Taxa	28.00	5.42	5.42
Total Ephemeroptera	2.00	4.00	4.00
Total Trichoptera	1.00	1.43	1.43
% Filter Feeders	32.28	7.34	7.34
Total Clingers	3.00	4.29	4.29
Total Long-lived Taxa	2.00	6.67	6.67
% Dominance	29.75	6.85	6.85
% Tanytarsini	20.25	8.99	8.99
Total Sensitive Taxa	2.00	2.86	2.86
% Very Tolerant Individuals	10.76	5.59	5.59

SCI Sum	53.43
Final SCI score	59.36

Table 3 SCI full results for Sample A

Stream Condition Index Results for Little Alafia below M edard SCIA																				
Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Abundance	Collapsed Abundance	Taxa Presence	Ephemeropt era	Trichoptera Taxa	50% Filterer	100% Filterer	Clinger Taxa	Long-lived Taxa	Dominant Taxa	Tanytarsini	Sensitive Taxa	Very Tolerant	Specimen Notes
Annelida		Citellata	Oligochaeta	Tubificida	Naididae	Tubificinae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	Damaged and/or immature, not A. pigueti
Annelida		Citellata	Oligochaeta	Tubificida	Naididae	Nais communis	2	2	1	0	0	0	0	0	0	0	0	0	2	
Annelida		Citellata	Oligochaeta	Tubificida	Naididae	Nais pseudobius	4	4	1	0	0	0	0	0	0	0	0	0	0	
Annelida		Citellata	Oligochaeta	Tubificida	Naididae	Ailoriae inaequalis	1	1	1	0	0	0	0	0	0	0	0	0	0	
Annelida		Citellata	Oligochaeta	Tubificida	Naididae	Stylaria fossularis	2	2	1	0	0	0	0	0	0	0	0	0	0	
Annelida		Citellata	Hirudinida	Rhynchobdellida	Glossiphoniidae	Glossiphoniidae spp.	1		0	0	0	0	0	0	0	0	0	0	0	Immature
Annelida		Citellata	Hirudinida	Rhynchobdellida	Glossiphoniidae	Plecochella phalera	1	2	1	0	0	0	0	0	0	0	0	0	2	
Mollusca		Gastropoda	Heterobranchia	Hydrophila	Ancylidae	Ancylidae spp.	2		0	0	0	0	0	0	0	0	0	0	0	Damaged and/or immature
Mollusca		Gastropoda	Heterobranchia	Hydrophila	Ancylidae	Hebertancylus excentricus	1	3	1	0	0	0	0	0	0	0	0	0	3	
Mollusca		Gastropoda	Heterobranchia	Hydrophila	Physidae	Physidae spp.	1		0	0	0	0	0	0	0	0	0	0	0	Damaged
Mollusca		Gastropoda	Heterobranchia	Hydrophila	Physidae	Physa acuta	3	4	1	0	0	0	0	0	0	0	0	0	4	
Mollusca		Bivalvia	Heterodonta	Veneroida	Corbiculidae	Corbicula spp.	4	4	1	0	0	0	0	4	0	1	0	0	0	0
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Dagrellinellidae	Hyalella azteca sp. complex	4	4	1	0	0	0	0	0	0	0	0	0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	Baetidae spp.	5		0	0	0	0	0	0	0	0	0	0	0	Damaged, not L. propinquus
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	Labiobaetis propinquus	2	2	1	1	0	0	0	0	0	0	0	0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	Baetis intercalaris	1	6	1	1	0	0	0	0	0	0	0	0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	Cheumatopsyche spp.	22	22	1	0	1	0	22	1	0	0	0	0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Eimidae	Microclypeus spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	1larva
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Hydraenidae	Hydraena marginicollis	1	1	1	0	0	0	0	0	0	0	0	0	0	1adult
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera		Diptera spp.	1		0	0	0	0	0	0	0	0	0	0	0	1pupa, not Empididae
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Chironomidae spp.	4		0	0	0	0	0	0	0	0	0	0	0	4 pupae
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Cryptochironomus spp.	2	2	1	0	0	0	0	0	0	0	0	0	2	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Polypedilum scalanum group	15	16	1	0	0	0	0	0	0	0	0	0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Polypedilum flavum	33	36	1	0	0	0	0	0	0	0	0	0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Polypedilum lilinoense group	1	1	1	0	0	0	0	0	0	0	0	0	1	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Rheotanytarsus exiguis group	25	26	1	0	0	0	26	1	0	0	26	0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Ababesmyia thamphe group	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Dicrotelipes spp.	1	1	1	0	0	1	0	0	0	0	0	0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Gouldichironomus spp.	2	2	1	0	0	0	0	0	0	0	0	0	2	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Pentaneura incospicua	3	3	1	0	0	0	0	0	0	0	0	0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Polypedilum beckae	2	2	1	0	0	0	0	0	0	0	0	0	2	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Theremanniella xena	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Cricotopus or Orthocladus	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Ceratopogonidae	Bezzia/Palponia spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	1larva
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Empididae	Hemerodromia spp.	2	2	1	0	0	0	0	0	0	0	0	1	0	1pupa, 1larva
Arthropoda	Chelicerata	Arachnida	Acari	Trombidiformes	Hygrobatidae	Hygrobatess spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	0

Table 4 SCI full results for Sample B

Stream Condition Index Results for Little Alafia below Medard SCIB

Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Abundance	Collapsed Abundance	Taxa Presence	Ephemeroptera	Trichoptera	50% Filterer	100% Filterer	Clinger Taxa	Long-lived Taxa	Dominant Taxa	Tanytarsi	Sensitive Taxa	Very Tolerant	Specimen Notes
Platyhelminthes					Platyhelminthes spp.		1	1	1	0	0	0	0	0	0	0	0	0	0	
Annelda		Citellata	Oligochaeta	Tubificida	Naididae	<i>Pristina americana</i>	1	1	1	0	0	0	0	0	0	0	0	0	0	
Annelda		Citellata	Oligochaeta	Tubificida	Naididae	<i>Nais communis</i>	1	1	1	0	0	0	0	0	0	0	0	0	0	
Annelda		Citellata	Oligochaeta	Tubificida	Naididae	<i>Nais pseudobutusa</i>	2	2	1	0	0	0	0	0	0	0	0	0	0	
Annelda		Citellata	Oligochaeta	Tubificida	Naididae	<i>Allonais inaequalis</i>	1	1	1	0	0	0	0	0	0	0	0	0	0	
Annelda		Citellata	Oligochaeta	Tubificida	Naididae	<i>Stylaria fossilis</i>	1	1	1	0	0	0	0	0	0	0	0	0	0	
Mollusca		Gastropoda	Caenogastropoda		Pleuroceridae	<i>Pleurocera floridensis</i>	1	1	1	0	0	0	0	0	0	0	0	0	0	
Mollusca		Gastropoda	Heterobranchia	Hydrophila	Ancylidae	Ancylidae spp.	2		0	0	0	0	0	0	0	0	0	0	0	Damaged
Mollusca		Gastropoda	Heterobranchia	Hydrophila	Ancylidae	<i>Hebetancylus excentricus</i>	1	3	1	0	0	0	0	0	0	0	0	0	3	
Mollusca		Gastropoda	Caenogastropoda	Littorinimorpha	Hydrobiidae	<i>Pyrgophorus platyrachis</i>	2	2	1	0	0	0	0	0	0	0	0	0	2	
Mollusca		Bivalvia	Heterodonta	Veneroida	Corbiculidae	<i>Corbicula</i> spp.	2	2	1	0	0	0	2	0	1		0	0	0	
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Dogielinotidae	<i>Hyalella azteca</i> sp. complex	4	4	1	0	0	0	0	0	0	0	0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	Baetidae spp.	3		0	0	0	0	0	0	0	0	0	0	0	Damaged, not L. propinquus
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	<i>Labobaetis propinquus</i>	2	2	1	1	0	0	0	0	0	0	0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	<i>Baetis intercalaris</i>	3	6	1	1	0	0	0	0	0	0	0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	Hydropsychidae spp.	5		0	0	0	0	0	0	0	0	0	0	0	Immature
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	<i>Cheumatopsyche</i> spp.	11	16	1	0	1	0	16	1	0		0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Diptera spp.		2		0	0	0	0	0	0	0	0	0	0	0	2 pupae damaged, not Empididae or Simuliidae
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Chironomidae spp.	3		0	0	0	0	0	0	0	0	0	0	0	2 pupae, 1 damaged larva
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	<i>Polypedium halterale</i> group	1	1	1	0	0	0	0	0	0	0	0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	<i>Polypedium scalaenum</i> group	14	15	1	0	0	0	0	0	0	0	0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	<i>Polypedium lixum</i>	45	47	1	0	0	0	0	0	0	0	0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	<i>Polypedium illinoense</i> group	2	2	1	0	0	0	0	0	0	0	0	0	2	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	<i>Rheotanytarsus exiguus</i> group	30	32	1	0	0	0	32	1	0		32	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	<i>Glyptotendipes</i> spp.	3	3	1	0	0	0	0	0	0	0	0	0	3	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	<i>Goeldichironomus</i> spp.	4	4	1	0	0	0	0	0	0	0	0	0	4	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	<i>Pentaneura inconspicua</i>	3	3	1	0	0	0	0	0	0	0	0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	<i>Stenochironomus</i> spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	<i>Polypedium beckae</i>	2	2	1	0	0	0	0	0	0	0	0	0	2	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	<i>Cricotopus</i> or <i>Orthocladius</i>	1	1	1	0	0	0	0	0	0	0	0	0	0	
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Simuliidae	<i>Simulium</i> spp.	1	1	1	0	0	0	1	1	0	0	0	1	0	1 larva
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Empididae	<i>Hemerodromia</i> spp.	2	2	1	0	0	0	0	0	0	0	0	1	0	2 larvae
Arthropoda	Hexapoda	Insecta	Pterygota	Megaloptera	Corydalidae	<i>Corydalis cornutus</i>	1	1	1	0	0	0	0	0	0	1	0	0	0	

Water Quality Assessment

Long-term water quality data is available for Little Alafia River. The data that is available was collected by the United States Geological Survey (1969-1980), Florida Department of Environmental Protection (2011-2020) and Hillsborough County Environmental Protection Commission (2005- 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 Little Alafia River Physical Water Quality (Field)

Little Alafia River below Medard Reservoir								
Date	Depth (m)	Temp (°C)	pH	DO (mg/L)	DO (%) Sat	Cond (UMHO/cm)	Salinity (PPT)	Secchi Depth (m)
1/30/20	0.2	17.1	8.18	5.44	56.2	285	0.13	1.5
Mean POR		19.3	7.88	6.33	72.5	300.3	0.13	0.36

The chemical water quality analysis for Little Bullfrog 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 0.161 mg/L (2005-2019). The three year geometric mean value for Total Phosphorous was 0.180 mg/L. Total Phosphorous values for the sample from this assessment were 0.274 mg/L. Total Nitrogen values were below the nutrient region threshold developed by FDEP of 1.65 mg/L with a mean value of 1.062 mg/L for the period of record (2005-2019). The three year geometric mean value for Total Nitrogen was 0.925 mg/L. The Total Nitrogen value from the assessment was below the threshold with a concentration of 0.761 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 2005-2019), and in the site specific evaluation range for the most recent 3-years of samples (4.2 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 738 colonies/100 ml, 2,520/100 ml for Enterococci.

Table 6 Little Alafia River Water Quality (Laboratory)

Parameter	Little Alafia River	POR Mean	Units
Alkalinity	131	153.8	mg/LCaCO ₃
Color(345)F.45	40	22.5	Pt/Co
E. Coli	105	175.6	#/100 ml
Enterococci	39.3	370.9	#/100 ml
Chlorophyll a	19.9	39.3	ug/L
Chlorophyll b	1.4	1.8	ug/L
Chlorophyll c	1.2	2.4	ug/L
Chlorophyll t	22.5	6.2	ug/L
Chlorophylla Corr	11.3	20.4	ug/L
Chlorophyll-pheo	13.6	3.7	ug/L
Ammonia	0.228	0.219	mg/L
Kjeldahl Nitrogen	0.981	1.709	mg/L
Total Nitrogen	1.390	1.693	mg/L
Nitrates/Nitrites	0.405	0.043	mg/L
Total Phosphorus	0.404	0.420	mg/L

Conclusion

Little Alafia River below Medard Reservoir is located in a mixture of pasture, reclaimed and residential land use 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. The Habit Assessment resulted in a suboptimal score of 85. Less than 2 square meters of aquatic vegetation was observed in the Linear Vegetation Survey. Little Alafia River below Medard Reservoir did meet standards for the Rapid Periphyton Survey with 0% of samples being ranked between 4 and 6. The historical water quality record for Little Alafia River 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		Little Alafia River	3-Year Mean	Threshold
Total Phosphorous (mg/l)		0.404	0.420	< 0.49
Total Nitrogen (mg/l)		1.390	1.494	< 1.65
RPS (% Rank 4-6)		0%		< 25%
LVS	Avg C of C	< 2m ²		≥ 2.5
	FLEPPC %	< 2m ²		< 25%
Chlorophyll (µg/l)		11.3	4.89	< 20 µg/l
Habitat Assessment		85		> 34
SCI		57		> 34