



Pemberton Creek

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 2016 Hillsborough County aerial, 2011 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

Pemberton Creek is located in eastern Hillsborough County. Its headwaters are located west of Paul Buckman Highway and Sam Allen Rd. The outfall of Pemberton Creek is in Baker Creek. The assessment of Pemberton Creek was conducted on April 18, 2018. At the time of the assessment, the water levels were normal. The Pemberton Creek watershed is dominated by residential (33.0%), Agriculture (27.7%) and natural (27.2%) land uses. The calculated landscape development intensity index was a 4.2.

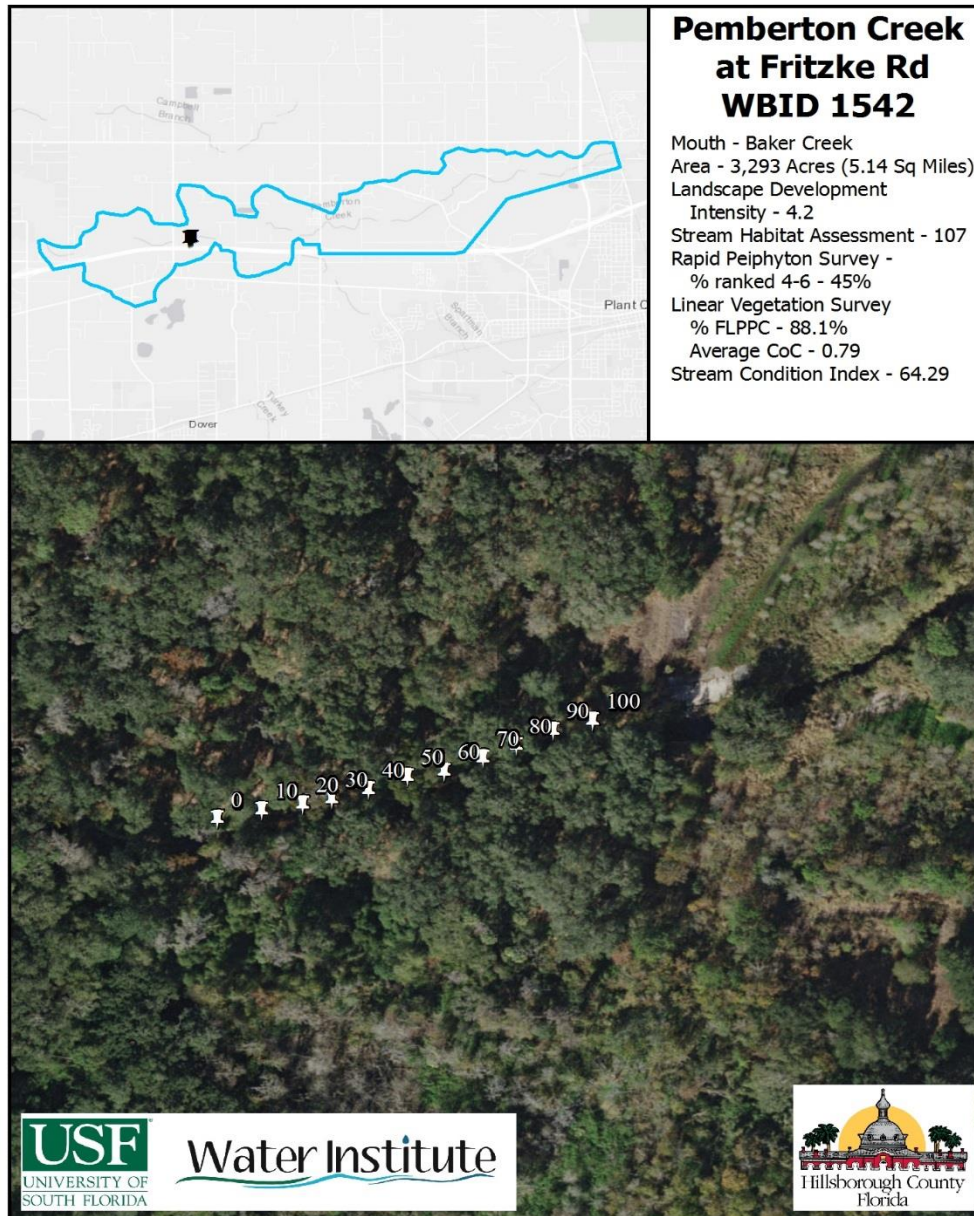


Figure 1 2018 Pemberton Creek Study Area Map

Habitat and Vegetation Assessment



Figure 2 Overview photograph of Pemberton Creek at Fritzke Rd Sample Site

The primary habitat components of the FDEP Habitat Assessment focus on in-water habitat. The primary habitat components score in the optimal category for substrate diversity and substrate availability. 5.8% of the surface area of the assessment region occupied by major productive habitat (3.8% Rock, 1.5% Macrophytes, and 0.5% Snag). Minor habitats included leaf packs, roots sand and silt. Optimal scores were achieved for water velocity (0.45 m/s). Suboptimal scores were achieved for Substrate Diversity and Habitat Smothering due to >25% of habitats affected by sedimentation. Poor scores were noted for Substrate Availability with 5.8% of the stream being major productive habitat. 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. Pemberton Creek has been intensively straightened and channelized in the past but sufficient time has passed for the surrounding vegetation to return. The secondary habitat components scored in the optimal category for Riparian Buffer Width on each bank. Bank Stability scored optimally for the right bank and sub-optimally for the left bank due to some eroded zones and steep banks. Riparian Zone Vegetation Quality scored in the suboptimal range for both banks due to the presence of non-native vegetation and obvious disruption to the community. The artificial channelization category scored in the marginal category. The riparian buffer zone surrounding the stream was greater than 18 meters on both banks and consisted of mostly native vegetation. The vegetation in the stream itself was dominated by non-native invasive species likely from an upstream source. The secondary habitat

Periphyton was abundant in the assessment region of Pemberton Creek. A total of 45 of the 99 periphyton samples were classified as being ranked 4-6 (6mm – >10cm). The periphyton community was dominated by *Lyngbya spp* with *Spyrogyra spp.* also present. The canopy cover in the assessment region averaged 82%. The results of the rapid periphyton survey indicates an imbalance in the community.

Table 1 Linear Vegetation Survey Results – Pemberton Creek

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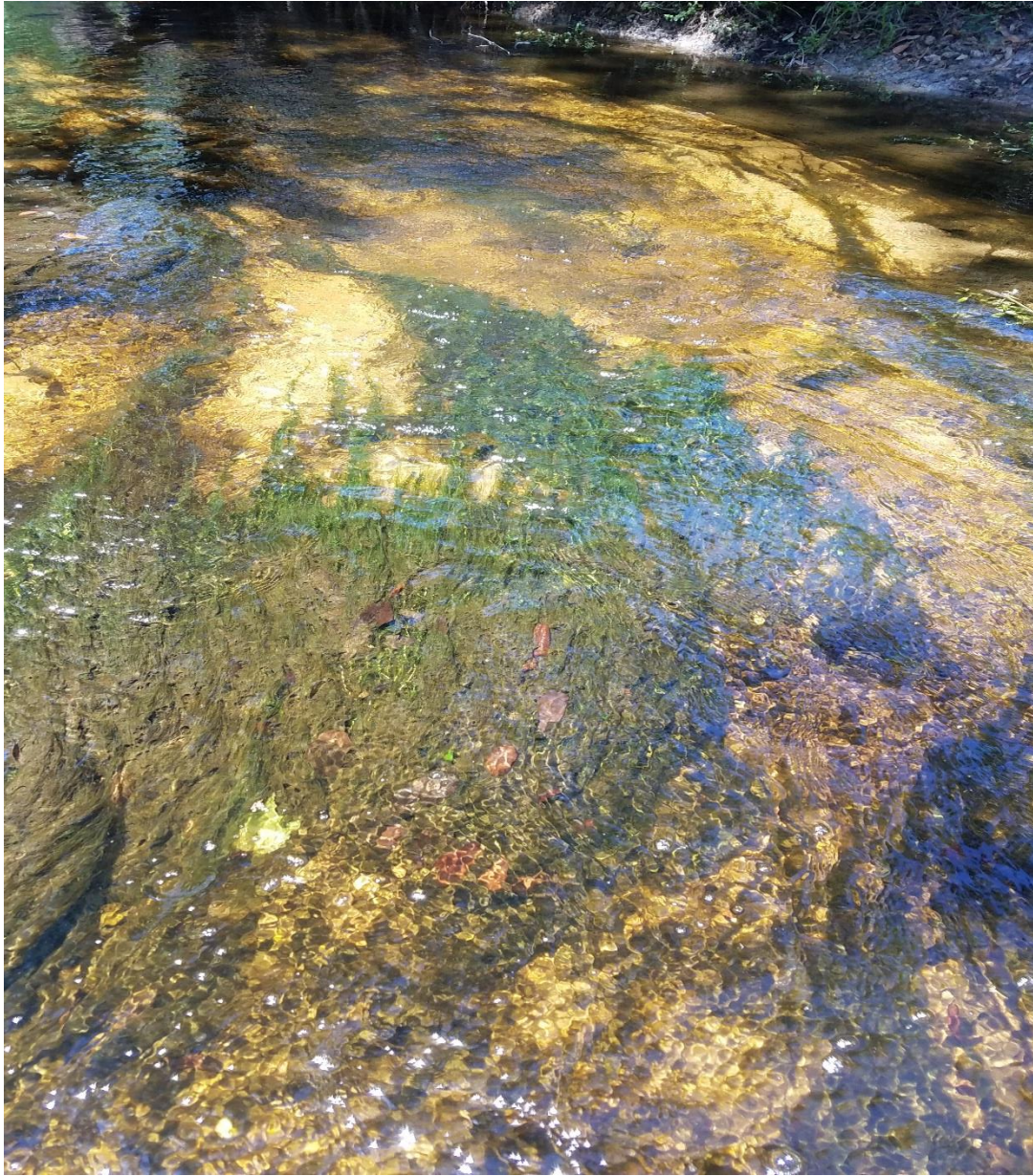


Figure 3 Hydrilla verticillata and periphyton dominated by Lyngbya on Pemberton Creek

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 Pemberton Creek was 64.29 out of a possible 100 points, corresponding with an “Exceptional” designation, with the expected community of a healthy stream.

Metric summaries are shown for both subsamples in Table 2. Both samples contained both long-lived taxa and sensitive taxa. High scores were achieved for Total Ephemeroptera, Total Clingers, % Dominance, % Tanytarsini and % Very Tolerant individuals. The full results of the SCI sampling are shown in Table 3 (Sample A) and Table 4 (Sample B) for Pemberton Creek.

Table 2 SCI metric summaries for Pemberton Creek subsample A (top) and subsample B (bottom)

SCI Metric	Raw Totals	SCI scores	Adjusted SCI scores
Total Taxa	22.00	2.92	2.92
Total Ephemeroptera	3.00	6.00	6.00
Total Trichoptera	2.00	2.86	2.86
% Filter Feeders	21.48	4.83	4.83
Total Clingers	5.00	7.14	7.14
Total Long-lived Taxa	1.00	3.33	3.33
% Dominance	29.53	6.89	6.89
% Tanytarsini	12.08	7.56	7.56
Total Sensitive Taxa	2.00	2.86	2.86
% Very Tolerant Individuals	2.68	8.49	8.49
SCI Sum	52.88		
Final SCI score	58.76		

SCI Metric	Raw Totals	SCI scores	Adjusted SCI scores
Total Taxa	29.00	5.83	5.83
Total Ephemeroptera	4.00	8.00	8.00
Total Trichoptera	4.00	5.71	5.71
% Filter Feeders	25.63	5.80	5.80
Total Clingers	5.00	7.14	7.14
Total Long-lived Taxa	1.00	3.33	3.33
% Dominance	27.22	7.36	7.36
% Tanytarsini	17.72	8.62	8.62
Total Sensitive Taxa	2.00	2.86	2.86
% Very Tolerant Individuals	3.16	8.18	8.18
SCI Sum	62.84		
Final SCI score	69.82		

Table 3 SCI full results for Sample A

Pemberton Creek SCA
Stream Condition Index (SCI)
Samples Collected 04/18/2018
Project #: 606310278

Stream Condition Index Results for Pemberton Creek SCA

Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Abundance	Collected Abundance	Taxa Present	Ephemeroptera Taxa	Trichoptera Taxa	SPH Filterer	100% Filterer	Cinger Taxa	Long-lived Taxa	Dominant Taxa	Tanytrichi	Sensitive Taxa	Very Tolerant Individuals	Specimen Notes
Ameletidae	Cheilara	Orthoptera	Orthoptera	Turficidae	Naididae	Misopodis	1	1	1	0	0	0	0	0	0	0	0	0	1	
Ameletidae	Cheilara	Orthoptera	Orthoptera	Turficidae	Naididae	Sylvio fissulobis	1	1	1	0	0	0	0	0	0	0	0	0		Reference collection
Mollusca	Gastropoda	Neurobranchia	Neurobranchia	Hygrophila	Anguillae	Anguillae spp.	6	6	1	0	0	0	0	0	0	0	0	0		0 Damaged
Mollusca	Gastropoda	Neurobranchia	Neurobranchia	Hygrophila	Parachidae	Parachidae spp.	1	1	1	0	0	0	0	0	0	0	0	0		1 Damaged
Mollusca	Gastropoda	Carogastropoda	Carogastropoda	Utricolimnophila	Hydrobiidae	Pygophorus phytophagis	1	1	1	0	0	0	0	0	0	0	0	0	1	
Mollusca	Gastropoda	Carogastropoda	Carogastropoda	Utricolimnophila	Hydrobiidae	Ambicula dollii	1	1	1	0	0	0	0	0	0	0	0	0	0	
Mollusca	Bivalvia	Neurodonta	Neurodonta	Conchidae	Conchidae	Conchidae spp.	10	10	1	0	0	0	10	0	1	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Beridae	Beridae spp.	11		0	0	0	0	0	0	0	0	0	0		0 Damaged not L. propinquus
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Beridae	Lobobertis propinquus	22	22	1	1	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Beridae	Bertis interobis	3	3	1	1	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Heptageniidae	Heptageniidae spp.	3	3	0	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Heptageniidae	Macrocricium pinguum	1	4	1	1	0	0	0	1	0	0	0	1	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Onosida	Onosida spp.	1	1	0	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Hydroscaphidae	Hydroscaphidae spp.	2		0	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Hydroscaphidae	Chamaedoniscus spp.	7	9	1	0	1	0	9	1	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Hydroscaphidae	Hydroscaphidae spp.	1		0	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Hydroscaphidae	Hydroscaphidae spp.	2	3	1	0	1	0	0	1	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Stenelmis spp.	1	1	1	0	0	0	0	1	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Macrocladus spp.	5	5	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1		0	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	4		0	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	3	3	1	0	0	1.5	0	0	0	0	3	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	14	15	1	0	0	7.5	0	0	0	0	15	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	40	44	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera	Heptapoda	Peripoda	Peripoda	Peripoda	Emidae	Emidae spp.	1	1	1	0	0	0								

Table 4 SCI full results for Sample B

Pemberton Creek SCIB
Stream Condition Index (SCI)
Samples Collected 04/18/2018
Project #: 60631/0278

Stream Condition Index Results for Pemberton Creek SCA

Phylum	Subphylum	Class	Subclass	Order	Family	Taxa	Abundance	Colony Abundance	Taxa Presence	Chironomidae Taxa	Trichoptera Taxa	SPS Filterer	100% Filterer	Clinger Taxa	Long-tail Taxa	Dominant Taxa	Tamashii	Sensitive Taxa	Very Rare Individuals	Specimen Notes
Archeida		Chlorata	Dicliotheca		Nitidulce	Mos sporadic	2	2	1	0	0	0	0	0	0	0	0	0	2	
Archeida		Chlorata	Dicliotheca		Nitidulce	Synbio fissuris	4	4	1	0	0	0	0	0	0	0	0	0	0	Reference collection
Mollicata		Gastropoda	Heterodonta		Nitidulce	Archelus spp.	7	7	1	0	0	0	0	0	0	0	0	0	0	Damaged
Mollicata		Gastropoda	Ctenogastropoda		Nitidulce	Pygospio pleurancistris	1	1	1	0	0	0	0	0	0	0	0	0	1	
Mollicata		Gastropoda	Ctenogastropoda		Nitidulce	Ammoco dalli	1	1	1	0	0	0	0	0	0	0	0	0	0	
Mollicata		Bivalvia	Heterodonta		Cardulidae	Cardulio spp.	7	7	1	0	0	0	7	0	1	1	0	0	0	
Phlebobranchia		Phlebobranchia	Phlebobranchia		Cardidae	Cardis dominica	2	2	1	1	0	0	0	0	0	0	0	0	0	
Actinoptera		Actinoptera	Actinoptera		Baetidae	Baetidae spp.	10	10	0	0	0	0	0	0	0	0	0	0	0	Damaged not L. propinquus
Actinoptera		Actinoptera	Actinoptera		Baetidae	Lubbock's propinquus	6	6	1	1	0	0	0	0	0	0	0	0	0	
Actinoptera		Actinoptera	Actinoptera		Baetidae	Baeti maritimus	2	12	1	1	0	0	0	0	0	0	0	0	0	
Actinoptera		Actinoptera	Actinoptera		Hydroptilidae	Hydroptilidae spp.	2	2	0	0	0	0	0	0	0	0	0	0	0	Damaged
Actinoptera		Actinoptera	Actinoptera		Hydroptilidae	Maccaffertium smithae	1	3	1	1	0	0	0	0	1	0	0	1	0	
Actinoptera		Actinoptera	Actinoptera		Coenagrionidae	Coenagrionidae spp.	2	2	1	0	0	0	0	0	0	0	0	0	0	Diminutive
Actinoptera		Actinoptera	Actinoptera		Leptoceridae	Leptoceridae spatio	1	1	1	0	1	0	0	0	0	0	0	0	0	
Actinoptera		Actinoptera	Actinoptera		Hydroptilidae	Hydroptilidae spp.	4	4	0	0	0	0	0	0	0	0	0	0	0	Diminutive
Actinoptera		Actinoptera	Actinoptera		Chironomidae	Chironomidae spp.	7	11	1	1	0	1	11	1	0	0	0	0	0	
Actinoptera		Actinoptera	Actinoptera		Hydroptilidae	Oxyethia spp.	1	1	0	1	0	1	0	0	0	0	0	0	0	
Actinoptera		Actinoptera	Actinoptera		Hydroptilidae	Hydroptilidae spp.	4	4	1	1	0	1	0	0	1	0	0	0	0	
Actinoptera		Actinoptera	Actinoptera		Chironomidae	Chironomidae spp.	1	1	0	0	0	0	0	0	0	0	0	0	0	Damaged
Actinoptera		Actinoptera	Actinoptera		Chironomidae	Dubautia spp.	2	2	1	0	0	0	0	0	0	0	0	0	0	0 Adults
Actinoptera		Actinoptera	Actinoptera		Chironomidae	Microgasteria spp.	7	8	1	0	0	0	0	0	0	0	0	0	0	0? Adults, 5 larvae
Actinoptera		Actinoptera	Actinoptera		Diptera	Diptera spp.	1	1	0	0	0	0	0	0	0	0	0	0	0	Diptera
Actinoptera		Actinoptera	Actinoptera		Chironomidae	Chironomidae spp.	7	7	0	0	0	0	0	0	0	0	0	0	0	Diptera
Actinoptera		Actinoptera	Actinoptera		Chironomidae	Chironomidae spp.	2	2	1	0	0	1	0	0	0	0	2	0	0	
Actinoptera		Actinoptera	Actinoptera		Chironomidae	Tanytarsus spp.	1	1	1	0	0	0.5	0	0	0	0	1	0	0	0 Not L. baileyi
Actinoptera		Actinoptera	Actinoptera		Chironomidae	Tanytarsus baileyi	20	21	1	0	0	11	0	0	0	0	22	0	0	
Actinoptera		Actinoptera	Actinoptera		Chironomidae	Cryptochironomus spp.	1	1	1	0	0	0	0	0	0	0	0	0	1	
Actinoptera		Actinoptera	Actinoptera		Diptera	Diptera	38	43	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera		Actinoptera	Actinoptera		Chironomidae	Polypedilum lineaceus group	1	1	1	0	0	0	0	0	0	0	0	0	1	
Actinoptera		Actinoptera	Actinoptera		Diptera	Methochorus exiguus group	2	3	0	0	0	0	3	1	0	0	0	0	0	
Actinoptera		Actinoptera	Actinoptera		Diptera	Stenochironomus spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera		Actinoptera	Actinoptera		Diptera	Chironomidae	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera		Actinoptera	Actinoptera		Diptera	Chironomidae	1	1	1	0	0	0	0	0	0	0	0	0	0	
Actinoptera		Actinoptera	Actinoptera		Diptera	Tripidae	1	1	1	0	0	0	0	0	0	0	0	0	0	Diptera Inactive
Actinoptera		Actinoptera	Actinoptera		Diptera	Tripidae spp.	7	7	1	0	0	0	7	1	0	0	0	1	0	
Actinoptera		Actinoptera	Actinoptera		Diptera	Simulium spp.	1	1	1	0	0	0	0	0	0	0	0	0	0	0 Adult female, Reference collection

Water Quality Assessment

Limited long-term water quality data is available for Pemberton Creek. The data that is available was collected by the Hillsborough County Environmental Protection Commission, Florida LAKEWATCH and the Florida Department of Environmental Protection. Values for the physical water parameters begin in 1997 and continue through present. Values for the laboratory water parameters begin in 2004 and continue through present, including the sample taken along with this assessment. The 2017 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 Pemberton Creek Physical Water Quality (Field)

Pemberton Creek								
Date	Depth (m)	Temp (°C)	pH	DO (mg/L)	DO (% Sat)	Cond (UMHO/cm)	Salinity (PPT)	Secchi Depth (m)
4/18/18	0.4	22.98	7.71	6.95	79.1	234	0.12	0.75
Mean POR		21.85	7.44	6.39	72.55	282	0.13	0.29

The chemical water quality analysis for Pemberton Creek is shown in Table 6 along with mean values for the period of record for available parameters. Period of record mean and the sample for this assessment for Total Phosphorous values were below the nutrient region threshold developed by FDEP of 0.49 mg/L with a mean value of 0.327 mg/L (2004- present). Total Phosphorous values for the sample from this assessment were 0.187 mg/L. Total Nitrogen values were below the nutrient region threshold developed by FDEP of 1.65 mg/L with a mean value of 0.802 mg/L (2004- present). The Total Nitrogen value from the assessment was also below the threshold with a concentration of 0.455 mg/L. Chlorophyll-a corrected values fall below the site specific evaluation range of 3.2 µg/l to 20 µg/l for both the most recent sample (2.2 µg/l) and the period of record (2.82 µg/l 2004- present). For sites with Chlorophyll-a values in this range, the assessment does not show an imbalance in flora. Low biomass of the bacterial parameters was observed in both the sample for this assessment and the long term dataset.

The FDEP Numerical Nutrient Criteria focuses on the most recent three years of data. For Phosphorous the geometric mean for each year remains below the threshold of 0.49 mg/L with concentrations of 0.307 mg/L, 0.335 mg/L and 0.327 mg/L for 2015, 2016 and 2017. However, during this period 4 samples exceed the threshold (1 in 2016, 3 in 2017).

For Total Nitrogen, the geometric mean for each year remains below the threshold of 1.65 mg/L with concentrations of 0.727 mg/L, 0.796 mg/L and 0.575 mg/L for 2015, 2016 and 2017. No single sample exceeded the threshold value.

Table 6 Pemberton Creek Water Quality (Laboratory)

Parameter	Pemberton Creek	POR Mean	Units
Alkalinity	164	N/A	mg/LCaCO ₃
Nitrates/Nitrites	0.011	0.081	mg/L
E. Coli	192	367	#/100 ml
Enterococci	510	559	#/100 ml
Chlorophyll a	2.2	2.16	ug/L
Chlorophyll b	5.1	N/A	ug/L
Chlorophyll c	0.7	N/A	ug/L
Chlorophyll t	7.8	N/A	ug/L
Chlorophylla Corr	2.2	2.82	ug/L
Chlorophyll-pheo	3.2	N/A	ug/L
Ammonia	0.026	0.016	mg/L
Kjeldahl Nitrogen	0.444	0.601	mg/L
Total Nitrogen	0.455	0.802	mg/L
Total Phosphorus	0.187	0.327	mg/L
Color(345)F.45	15.9	49.29	Pt/Co

Conclusion

Pemberton Creek at Fritzke Rd is located with some buffer of natural, undeveloped land surrounding it in a residential and agricultural. The stream itself showed moderate alterations to the stream flow, buffer and banks in the region assessed. At the time of the habitat assessment, the water levels were normal. Sufficient habitat for macroinvertebrates was observed. Due to these factors, the Habit Assessment resulted in a Suboptimal score of 107. Disruption to the vegetation community was observed in the results of the Linear Vegetation Survey with Pemberton Creek not meeting either metric for Average Coefficient of Conservatism or the Percent FLEPPC. Pemberton Creek also did not meet standards for the rapid periphyton survey with 45% of samples being ranked between 4 and 6. The dominant species in the periphyton community was *Lyngbya spp.* The historical water quality record for Pemberton Creek showed acceptable concentrations of Total Phosphorous and Total Nitrogen but showed violations to the Total Phosphorous Numeric Nutrient Criteria with 3 samples exceeding the threshold in the previous three years. The results of the SCI sampling indicate that the stream is “exceptional” 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		Pemberton Creek	Mean POR	Threshold
Total Phosphorous (mg/l)		0.187	0.327	< 0.49
Total Nitrogen (mg/l)		0.455	0.802	< 1.65
RPS (% Rank 4-6)		45%		< 25%
LVS	Avg C of C	0.79		≥ 2.5
	FLEPPC %	88.10%		< 25%
Chlorophyll (µg/l)		2.2	2.82	< 20 µg/l
Habitat Assessment		107		> 34
SCI		64.29		> 34