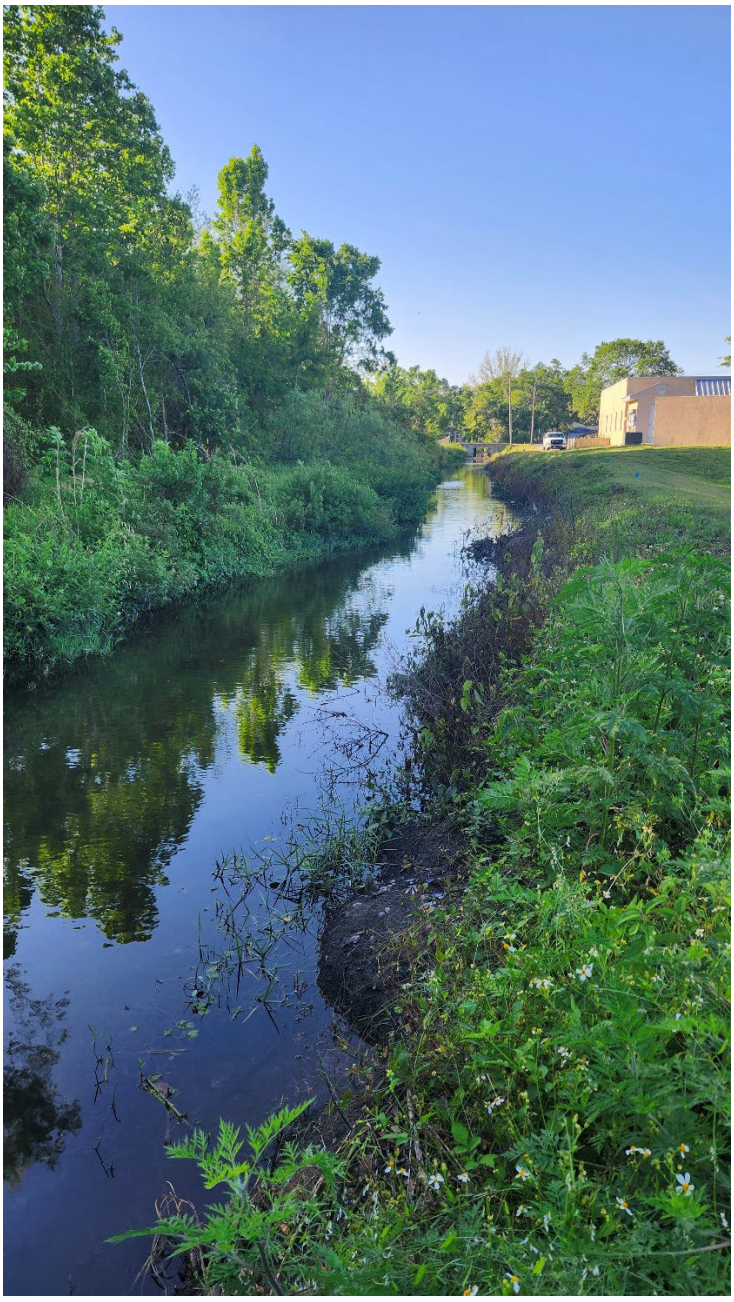


Mill Creek

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

David Eilers | USF Water Institute | March 17, 2025

Methods

STUDY AREA ANALYISIS

The watershed containing the stream being assessed was analyzed using ESRI ArcGIS Pro. Using this software with 2023 Hillsborough County aerial, 2020 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 100 meter buffer around the stream from the sampling site to 10km upstream. 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 one sampling location 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

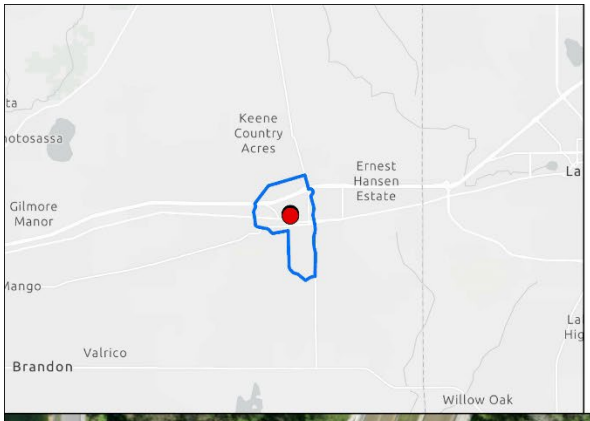
The Stream Condition Index (SCI) was sampled and calculated per DEP SOP SCI 1000. The SCI consists of collecting macroinvertebrates via 20 D-frame dipnet sweeps (0.5 m in length) in the most productive habitats in a 100 m reach of stream. The organisms are sub-sampled and identified to the lowest practical 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

Mill Creek is located in eastern Hillsborough County in the Pemberton Creek Watershed. Its headwaters are located south of Interstate 4 and Paul Buckman Highway in Plant City. The outfall of Mill Creek is in Pemberton Creek. The assessment of Mill Creek was conducted north of Victoria Street and est of North Alexander Street on March 17, 2025. At that time, the water levels were normal for the dry season. The Mill Creek WBID covers 2.91 square miles (3,456 acres) and the 100-meter buffer around the stream is dominated by commercial (28.8%), residential (23.9%), forest/natural (21.8%) and industrial (17.2%) land uses. The resulting calculated landscape development intensity index score was a 6.42.



Mill Creek
WBID 1542A

Mill Creek
Area - 3,456 Acres, (2.91 Sq miles)
Landscape Development (100m buffer)
Intensity - 6.42
Stream Habitat Assessment - 47
Rapid Periphyton Survey -
% ranked 4-6 - 1%
Linear Vegetation Survey
Mean Coefficient of Conservatism - 0.75
% FLEPPC - 68.6
Stream Condition Index - 44



Figure 1 2025 Mill Creek Study Area Map



Figure 2 Photograph of the Mill Creek Sample Site showing the typical shoreline and normal water conditions.

Habitat and Vegetation Assessment

The region of Mill Creek where the assessment was conducted is east of North Alexander Street and north of Victoria Street. The region was sparsely shaded with a mean canopy cover measurement of 5.9%. Mill Creek averaged 0.25 meters in depth and approximately 5.5 meters wide with a flow of 0.12 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 Water Velocity (0.12 m/s). Substrate Diversity (two major productive habitats (fine roots, snags) and Habitat Smothering (inadequate number of stable pools) scored in the marginal category. Substrate Availability was scored as poor for having major productive habitats in only 0.9% of the stream. Minor habitats included leaf and sand deposits. The total score for the primary habitat components was 25 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 poor category for Artificial Channelization for having a straightened channel and near uniform depths. Bank stability for both banks scored in the suboptimal category as each met 2 of the 3 measures of bank stability. Riparian zone vegetation quality and riparian buffer zone width for both banks scored in the poor category due to an abundance in invasive species and alterations to the buffer vegetation occurring within 6 meters. The secondary components received a score of 22 out of 80. The resulting FDEP Habitat Assessment score was 47.

Table 1 Scoring Summary for the Stream Habitat Assessment

Metric	Score
Primary Habitat Components	
Substrate Diversity	6
Substrate Availability	1
Water Velocity	12
Habitat Smothering	6
Primary Score	**25**
Secondary Habitat Components	
Artificial Channelization	2
Bank Stability - Right Bank	6
Bank Stability - Left Bank	6
Riparian Buffer Zone Width - Right Bank	1
Riparian Buffer Zone Width - Left Bank	3
Riparian Zone Vegetation Quality - Right Bank	1
Riparian Zone Vegetation Quality - Left Bank	3
Secondary Score	**22**
Habitat Assessment Score	**47**

Periphyton was encountered during 1 of the 99 samples taken during the Rapid Periphyton Survey. The sample with periphyton present was ranked 6 for being >10 cm in length. The tree canopy in the assessment area averaged 5.9%. These results do not indicate an excess of periphyton present in the stream as a result of an imbalance of nutrients.

The FDEP Linear Vegetation Survey encountered greater than two square meters of rooted herbaceous vegetation in Mill Creek at the time of the assessment. The vegetation community present was representative of a heavily disturbed system with seven of the twelve species observed are non-native to Florida. The resulting metrics for the linear vegetation survey were 0.75 for mean coefficient of conservatism and 68.6% for percent FLEPPC. Both of these values are failing their metrics.

Table 2 Linear Vegetation Survey Results – Mill 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	
Alternanthera philoxeroides	0	p	p	p	p	p	p	p	p	p	d	10
Colocasia esculenta	0	p		p	p	p	d	p	p	p	p	9
Panicum repens	0	p	p	p	p	p		p	p	p	p	9
Ludwigia peruviana	0	p	p	p	p	p	p					6
Commelina diffusa	2.02	p		p						p	p	4
Hydrocotyle	2	p	p				p				p	4
Boehmeria cylindrica	5		p	p								2
Lemna	1									p	p	2
Ludwigia leptocarpa	3		p						p			2
Ludwigia repens	3.2								p			1
Sphagneticola trilobata	0									p		1
Typha	1									p		1



Figure 3 A photograph displaying the typical disturbed vegetation community on Mill Creek.



Figure 4 An image showing the available snag habitat in Mill 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 aliquot separately. The final SCI score is an average of the two scores. The SCI score for Mill Creek was 44 out of a possible 100 points, corresponding with a "Category 1 - Healthy" designation, with the expected community of a healthy stream but showing some alterations in community from an exceptional stream. Both of the 2025 sub samples featured any high scoring metrics. The highest scoring metric was for percent dominance in both samples. Both of the samples featured several low scoring metrics including the percent filter feeders, total sensitive taxa and percent very tolerant individuals. The full results of the SCI sampling are shown in Table 3 (Sample A) and Table 4 (Sample B) for Mill Creek.

Table 2 SCI metric summaries for Mill Creek Sample A (top) and Sample B (bottom)

SCI Metric	Raw Totals	SCI scores	Adjusted SCI scores
Total Taxa	29.00	5.83	5.83
Total Ephemeroptera	3.00	6.00	6.00
Total Trichoptera	2.00	2.86	2.86
% Filter Feeders	8.97	1.92	1.92
Total Clingers	2.00	2.86	2.86
Total Long-lived Taxa	2.00	6.67	6.67
% Dominance	25.52	7.70	7.70
% Tanytarsini	4.83	5.18	5.18
Total Sensitive Taxa	0.00	0.00	0.00
% Very Tolerant Individuals	46.21	2.11	2.11

SCI Sum	41.13
Final SCI score	45.70

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	4.03	0.77	0.77
Total Clingers	2.00	2.86	2.86
Total Long-lived Taxa	2.00	6.67	6.67
% Dominance	29.53	6.89	6.89
% Tanytarsini	2.68	3.84	3.84
Total Sensitive Taxa	0.00	0.00	0.00
% Very Tolerant Individuals	46.31	2.11	2.11

SCI Sum	37.41
Final SCI score	41.57

Table 3 SCI full results for Sample A

Stream Condition Index Results for Mill 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
Annelida		Clitellata	Oligochaeta	Tubificida	Naididae	Tubificinae spp.	2	2	1	0	0	0	0	0	0		0	0	0
Annelida		Clitellata	Hirudinea	Hirudinida	Glossiphoniidae	*Helobdella papillata*	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
Mollusca		Gastropoda	Caenogastropoda	Littorinimorpha	Hydrobiidae	*Pyrgophorus platyrachis*	8	8	1	0	0	0	0	0	0		0	0	8
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Planorbidae	*Planorbella scalaris*	4	4	1	0	0	0	0	0	0		0	0	4
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Planorbidae	*Hebetancylus excentricus*	1	1	1	0	0	0	0	0	0		0	0	1
Mollusca		Gastropoda	Caenogastropoda		Thiaridae	*Melanoides tuberculata*	36	37	1	0	0	0	0	0	0		0	0	37
Mollusca		Gastropoda	Caenogastropoda		Thiaridae	*Tarebia granifera*	18	18	1	0	0	0	0	0	0		0	0	0
Mollusca		Bivalvia	Autobranchia	Venerida	Cyrenidae	*Corbicula* spp.	6	6	1	0	0	0	6	0	1		0	0	0
Mollusca		Bivalvia	Autobranchia	Unionida	Unionidae	Unionidae spp.	1	1	1	0	0	0	1	0	1		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Caenidae	*Caenis* spp.	5		0	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Caenidae	*Caenis diminuta*	4	9	1	1	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	*Callibaetis floridanus*	3	3	1	1	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	*Baetis intercalaris*	1	1	1	1	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Coenagrionidae	*Enallagma* spp.	2	2	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Leptoceridae	*Oecetis* spp.	2	2	1	0	1	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydroptilidae	*Hydroptila* spp.	2	2	1	0	1	0	0	1	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Chironomidae spp.	5		0	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Ablabesmyia mallochi*	5	6	1	0	0	0	0	0	0		0	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	*Tanytarsus* spp.	1		0	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus buckleyi*	1	1	1	0	0	0.5	0	0	0		1	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus* sp. U	2	2	1	0	0	1	0	0	0		2	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus* sp. T	2	3	1	0	0	1.5	0	0	0		3	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Cryptochironomus* spp.	1	1	1	0	0	0	0	0	0		0	0	1
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum halterale* group	2	2	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum illinoense* group	13	15	1	0	0	0	0	0	0		0	0	15
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Rheotanytarsus* spp.	1	1	1	0	0	0	1	1	0		1	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Dicrotendipes* spp.	3	4	1	0	0	2	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	*Thienemanniella* spp.	6	7	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Cricotopus* or *Orthocladius*	3	3	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Ceratopogonidae	Ceratopogoninae 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 Mill 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
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
Mollusca		Gastropoda	Caenogastropoda	Littorinimorpha	Hydrobiidae	*Pyrgophorus platyrachis*	6	6	1	0	0	0	0	0	0		0	0	6
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Planorbidae	*Laevapex fuscus*	3	3	1	0	0	0	0	0	0		0	0	3
Mollusca		Gastropoda	Caenogastropoda		Thiaridae	*Melanoides tuberculata*	43	44	1	0	0	0	0	0	0		0	0	44
Mollusca		Gastropoda	Caenogastropoda		Thiaridae	*Tarebia granifera*	32	32	1	0	0	0	0	0	0		0	0	0
Mollusca		Bivalvia	Autobranchia	Venerida	Cyrenidae	*Corbicula* spp.	3	3	1	0	0	0	3	0	1		0	0	0
Mollusca		Bivalvia	Autobranchia	Unionida	Unionidae	Unionidae spp.	1	1	1	0	0	0	1	0	1		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Caenidae	*Caenis* spp.	10		0	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Caenidae	*Caenis diminuta*	2	12	1	1	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	*Callibaetis floridanus*	1	1	1	1	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	*Procloeon viridoculare*	1	1	1	1	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Gomphidae	*Aphylla williamsoni*	1	1	1	0	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
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Leptoceridae	*Oecetis* sp. A	2	2	1	0	1	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydroptilidae	*Hydroptila* spp.	4	4	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
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Chironomidae spp.	6		0	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Ablabesmyia mallochi*	2	3	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Pentaneura inconspicua*	2	3	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus* sp. U	1	1	1	0	0	0.5	0	0	0		1	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus* sp. T	1	1	1	0	0	0.5	0	0	0		1	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus* sp. L complex	1	1	1	0	0	0.5	0	0	0		1	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Cryptochironomus* spp.	1	1	1	0	0	0	0	0	0		0	0	1
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum halterale* group	3	4	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum scalaenum* group	1	1	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum flavum*	1	1	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum illinoense* group	12	14	1	0	0	0	0	0	0		0	0	14
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	*Thienemanniella* spp.	1	1	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Cricotopus* or *Orthocladius*	3	4	1	0	0	0	0	0	0		0	0	0

Water Quality Assessment

Recent and long-term water quality data is available for Blackwater Creek. The data that is available was collected by the Hillsborough County Environmental Protection Commission at site 149 between 8/28/1990 and 7/14/2025. The 2025 USF Water Institute Assessment values fall within the range of the previous data collections. Table 6 provides a summary of the Physical/Chemical conditions recorded at the site.

Table 6 Mill Creek Physical Water Quality (Field) from 3/17/2025

WATER QUALITY	Depth (m)	Temp (°C)	pH (SU)	D.O. (MG/L)	D.O. Sat (%)	Cond. (µmhos/cm)	Salinity (PPT)	SECCHI (m)
Top:	0.25	22.92	7.63	6.32	73.15	373	0.18	0.3
Mid:								x VOB
Bottom:								Total Depth 0.3

The chemical water quality analysis for Mill Creek is shown in Table 7 with geometric mean values for the previous 3 years for available parameters. To calculate numeric nutrient criteria values there must be at least 4 samples during each year for the past three years.

The previous 3-year geometric mean values for Total Phosphorus values were below the nutrient region threshold developed by FDEP of 0.49 mg/L with a geometric mean value of 0.159 mg/L (2022), 0.189 mg/L (2023) and 0.258 mg/L (2024). The incomplete 2025 data have a geometric mean value of 0.228 mg/L. The period of record geometric mean value for total phosphorus was 0.268 mg/L.

Total Nitrogen values were below the nutrient region threshold developed by FDEP of 1.65 mg/L for the previous three-year period with a mean value of 0.406 mg/L (2022), 0.342 mg/L (2023) and 0.602 mg/L (2024). The incomplete 2025 data have a geometric mean value of 0.560 mg/L. The Total Nitrogen value from the period of record data was below the threshold with a concentration of 0.799 mg/L.

Chlorophyll-a corrected values fall below the site specific evaluation range of 3.2 µg/L to 20 µg/l for two of the most recent 3-years of samples (2.03 µg/L in 2022, 1.94 µg/L in 2023, 2.38 µg/L in 2024). The incomplete 2025 data have a geometric mean value of 3.0 µg/L. For sites with Chlorophyll-a values in this range, the assessment indicates conditions reflecting a balance in flora. The period of record geometric mean value for Chlorophyll-a corrected is 2.40 µg/L.

An low-moderate biomass of the bacterial parameters was observed in the 3-year dataset with Escherichia Coli having a geometric mean 164 colonies/100 ml, 979 colonies/100 ml for Enterococci.

Table 7 Mill Creek Water Quality (Laboratory)

Parameter	2022	2023	2024	2025	Period of Record	Units
E. Coli	70	60	73	138	94	#/100 ml
Enterococci	500	515	755	559	671	#/100 ml
Chlorophyll-a	2.49	2.04	2.78	4.11	2.85	µg/L
Chlorophyll-b	0.31	0.22	0.31	0.39	1.26	µg/L
Chlorophyll-c	0.63	0.6	0.63	0.6	1.00	µg/L
Chlorophyll-a Corrected	2.03	1.94	2.38	3.00	2.40	µg/L
Ammonia	0.051	0.058	0.069	0.062	0.087	mg/L
Kjeldahl Nitrogen	0.298	0.260	0.367	0.386	0.473	mg/L
Total Nitrogen	0.406	0.342	0.602	0.560	0.799	mg/L
Nitrates/Nitrites	0.098	0.076	0.185	0.146	0.261	mg/L
Total Phosphorus	0.159	0.189	0.258	0.228	0.268	mg/L

Conclusion

Mill Creek at North Alexander Street is located in a mixture of natural, commercial residential and industrial land uses. At the time of the habitat assessment, the water levels were normal for the dry season. The 100-meter region where the assessment was conducted was characterized by an artificially straightened channel with steep banks and some alterations to the vegetation community. Snag and fine roots were the most common productive habitat present. The Habit Assessment resulted in a poor score of 47. Disruption to the vegetation community was seen in the results of the Linear Vegetation Survey with the site not meeting either metric for percent FLEPPC or mean coefficient of conservatism. Mill Creek did meet the metrics for the rapid periphyton survey with 1% of samples being ranked between 4 and 6. The recent water quality record for Mill Creek showed concentrations of Chlorophyll-a corrected, Total Phosphorous and Total Nitrogen below the FDEP thresholds. The results of the SCI sampling indicate that the stream is "healthy" based on the macroinvertebrate community. Table 8 summarizes the results of nutrient sampling, floristic sampling, habitat assessment and SCI.

Table 8 Summary of Water Quality, Floristic Surveys and Habitat Assessments

Measure		Mill Creek	2022	2023	2024	Threshold
Total Phosphorous (mg/l)			0.159	0.189	0.258	< 0.49
Total Nitrogen (mg/l)			0.406	0.342	0.602	< 1.65
RPS (% Rank 4-6)		46%				< 25%
LVS	**Avg C of C**	<2 meters				≥ 2.5
	FLEPPC %	<2 meters				< 25%
Chlorophyll-a Corrected (µg/l)			2.03	1.94	2.38	< 20 µg/l
Habitat Assessment		47				> 34
SCI		44				> 34