

McDonald Branch

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

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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

McDonald Branch is located in eastern Hillsborough County in the Hillsborough Bay Watershed. Its headwaters are located south of Lithia Pinecrest Road in Hillsborough County. The outfall of McDonald Branch is in the Alafia River. The assessment of McDonald Branch was conducted north of Thompson Road on April 7, 2025 at that time, the water levels were normal for the dry season. The McDonald Branch WBID covers 2.54 square miles (1,626 acres) and the 100-meter buffer around the stream is dominated by forest/natural (39.8%), agricultural (34%) and residential (24.9%) land uses. The resulting calculated landscape development intensity index score was a 3.38.



McDonald Branch
WBID 1651

McDonald Branch
Area - 759 Acres, (2.12 Sq miles)
Landscape Development (100m buffer)
Intensity - 3.38
Stream Habitat Assessment - 107
Rapid Periphyton Survey -
% ranked 4-6 - 0%
Linear Vegetation Survey
Mean Coefficient of Conservatism - 2.57
% FLEPPC - 52.6
Stream Condition Index - 72



Figure 1 2025 McDonald Branch Study Area Map



Figure 2 Photograph of the McDonald Branch Sample Site showing the typical shoreline and normal water conditions.

Habitat and Vegetation Assessment

The region of McDonald Branch where the assessment was conducted is north of Thompson Road. The region was heavily shaded with a mean canopy cover measurement of 90.3%. McDonald Branch averaged 0.2 meters in depth and approximately 2.175 meters wide with a flow of 0.13 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 (0.13 m/s) and Habitat Smothering (adequate number of stable pools but > 25% of habitats affected by sand/silt/algae). Substrate Diversity (two major productive habitats (fine roots, snags) and Substrate Availability was scored as marginal for having major productive habitats in only 5.1% of the stream. Minor habitats included rock, leaf and sand deposits. The total score for the primary habitat components was 37 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 for having good sinuosity, Bank stability for both banks meeting 3 of the 3 measures of bank stability and Riparian buffer zone width with > 18 meters of buffer on each bank. Riparian zone vegetation quality for both banks scored in the suboptimal category due to an increase in invasive species. The secondary components received a score of 70 out of 80. The resulting FDEP Habitat Assessment score was 107.

Table 1 Scoring Summary for the Stream Habitat Assessment

Metric	Score
Primary Habitat Components	
Substrate Diversity	7
Substrate Availability	6
Water Velocity	12
Habitat Smothering	12
Primary Score	**37**
Secondary Habitat Components	
Artificial Channelization	18
Bank Stability - Right Bank	9
Bank Stability - Left Bank	9
Riparian Buffer Zone Width - Right Bank	9
Riparian Buffer Zone Width - Left Bank	9
Riparian Zone Vegetation Quality - Right Bank	8
Riparian Zone Vegetation Quality - Left Bank	8
Secondary Score	**70**
Habitat Assessment Score	**107**

Periphyton was not encountered during the 99 samples taken during the Rapid Periphyton Survey. The tree canopy in the assessment area averaged 90.3%. 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 McDonald Branch at the time of the assessment. The herbaceous vegetation occurrences were dominated by non-native species (*Colocasia esculenta* and *Sphagneticola trilobata)*, but also contained a sensitive species (*Orontium aquaticum).* The resulting metrics were 2.57 for mean coefficient of conservatism and 52.6% for percent FLEPPC. The results are passing for the mean coefficient of conservatism, but failing for the percent FLEPPC metric.

Table 2 Linear Vegetation Survey Results – McDonald 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	
Colocasia esculenta	0	p	p	p	p			p	p	p	p	8
Saururus cernuus	6.5							p	p	p	p	4
Hydrocotyle	2	p			p			p				3
Orontium aquaticum	8.39								p		p	2
Sphagneticola trilobata	0									p	p	2



Figure 3 A photograph displaying colocasia esculenta present at the McDonald Branch assessment site.

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Figure 4 USF Water Institute interns assisting with the assessment of McDonald 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 aliquot separately. The final SCI score is an average of the two scores. The SCI score for McDonald Branch was 72 out of a possible 100 points, corresponding with a "Category 1 - Exceptional" designation, with the expected community of a healthy stream. The two aliquots varied in which metrics scored highly with Sample A having high total ephemeroptera and Sample B scoring highly for total taxa, total sensitive taxa and percent very tolerant individuals. Neither sample contained any low scoring metrics. The full results of the SCI sampling are shown in Table 3 (Sample A) and Table 4 (Sample B) for McDonald Branch.

Table 2 SCI metric summaries for McDonald Branch Sample A (top) and Sample B (bottom)

SCI Metric	Raw Totals	SCI scores	Adjusted SCI scores
Total Taxa	34.00	7.92	7.92
Total Ephemeroptera	4.00	8.00	8.00
Total Trichoptera	4.00	5.71	5.71
% Filter Feeders	17.63	3.94	3.94
Total Clingers	5.00	7.14	7.14
Total Long-lived Taxa	2.00	6.67	6.67
% Dominance	34.62	5.88	5.88
% Tanytarsini	3.21	4.22	4.22
Total Sensitive Taxa	5.00	7.14	7.14
% Very Tolerant Individuals	4.49	7.49	7.49

SCI Sum	64.12
Final SCI score	71.24

SCI Metric	Raw Totals	SCI scores	Adjusted SCI scores
Total Taxa	36.00	8.75	8.75
Total Ephemeroptera	3.00	6.00	6.00
Total Trichoptera	4.00	5.71	5.71
% Filter Feeders	18.54	4.15	4.15
Total Clingers	5.00	7.14	7.14
Total Long-lived Taxa	1.00	3.33	3.33
% Dominance	34.44	5.91	5.91
% Tanytarsini	6.62	5.97	5.97
Total Sensitive Taxa	6.00	8.57	8.57
% Very Tolerant Individuals	1.32	9.64	9.64

SCI Sum	65.19
Final SCI score	72.43

Table 3 SCI full results for Sample A

Stream Condition Index Results for McDonald Branch 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	Lumbriculida	Lumbriculidae	*Lumbriculus* cf. *variegatus*	1	1	1	0	0	0	0	0	0		0	0	1
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Planorbidae	*Menetus dilatatus*	2	2	1	0	0	0	0	0	0		0	0	2
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Planorbidae	*Laevapex fuscus*	1	1	1	0	0	0	0	0	0		0	0	1
Mollusca		Gastropoda	Caenogastropoda		Pleuroceridae	*Pleurocera* spp.	3	3	1	0	0	0	0	0	0		0	0	0
Mollusca		Bivalvia	Autobranchia	Sphaeriida	Sphaeriidae	Sphaeriidae spp.	1	1	1	0	0	0	1	0	0		0	0	0
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	Asellidae	Asellidae spp.	2		0	0	0	0	0	0	0		0	0	0
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	Asellidae	*Lirceus* spp.	3	5	1	0	0	0	0	0	0		0	0	0
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda		Gammarida spp.	5		0	0	0	0	0	0	0		0	0	0
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda		Senticaudata spp.	28		0	0	0	0	0	0	0		0	0	0
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Gammaridae	*Gammarus* spp.	21	54	1	0	0	0	0	0	0		0	0	0
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Palaemonidae	*Palaemon* spp.	1	1	1	0	0	0	0	0	1		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Caenidae	*Caenis* spp.	2	2	1	1	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	Baetidae spp.	1	1	1	1	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	*Labiobaetis propinquus*	2	2	1	1	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Heptageniidae	Heptageniidae spp.	1	1	1	1	0	0	0	1	0		0	1	0
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Macromiidae	Macromiidae spp.	1		0	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Macromiidae	*Macromia illinoiensis*	1	2	1	0	0	0	0	0	1		0	1	0
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Coenagrionidae	*Argia sedula*	2	2	1	0	0	0	0	0	0		0	0	2
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Coenagrionidae	*Enallagma* spp.	1	1	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera		Trichoptera spp.	1	1	1	0	1	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Leptoceridae	Leptoceridae spp.	1	1	1	0	1	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	Hydropsychidae spp.	2	2	1	0	1	0	2	1	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	*Cheumatopsyche* spp.	1	1	1	0	1	0	1	1	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Dubiraphia* spp.	1	1	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Microcylloepus* spp.	12	12	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera		Diptera spp.	1		0	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Chironomidae spp.	3		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	*Polypedilum flavum*	5	7	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	*Polypedilum fallax* group	1	1	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Rheotanytarsus* spp.	3	4	1	0	0	0	4	1	0		4	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tribelos fuscicorne*	1	1	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Stenochironomus* spp.	1	1	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Parametriocnemus* spp.	2	3	1	0	0	0	0	0	0		0	1	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Cricotopus* or *Orthocladius*	1	1	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Simuliidae	*Simulium* spp.	19	19	1	0	0	0	19	1	0		0	1	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Empididae	*Hemerodromia* spp.	14	14	1	0	0	0	0	0	0		0	1	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Ceratopogonidae	*Atrichopogon* spp.	4	4	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Heteroptera	Veliidae	*Rhagovelia* spp.	2	2	1	0	0	0	0	0	0		0	0	0

Table 4 SCI full results for Sample B

Stream Condition Index Results for McDonald Branch 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
Platyhelminthes						Platyhelminthes spp.	1	1	1	0	0	0	0	0	0		0	0	0
Annelida		Clitellata	Oligochaeta	Lumbriculida	Lumbriculidae	*Lumbriculus* cf. *variegatus*	1	1	1	0	0	0	0	0	0		0	0	1
Mollusca		Gastropoda	Heterobranchia	Hygrophila	Planorbidae	*Ferrissia fragilis*	2	2	1	0	0	0	0	0	0		0	0	0
Mollusca		Gastropoda	Caenogastropoda		Pleuroceridae	*Pleurocera* spp.	3	3	1	0	0	0	0	0	0		0	0	0
Mollusca		Bivalvia	Autobranchia	Sphaeriida	Sphaeriidae	Sphaeriidae spp.	1	1	1	0	0	0	1	0	0		0	0	0
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	Asellidae	Asellidae spp.	5		0	0	0	0	0	0	0		0	0	0
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Isopoda	Asellidae	*Lirceus* spp.	2	7	1	0	0	0	0	0	0		0	0	0
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda		Gammarida spp.	4		0	0	0	0	0	0	0		0	0	0
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda		Senticaudata spp.	27		0	0	0	0	0	0	0		0	0	0
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Amphipoda	Gammaridae	*Gammarus* spp.	21	52	1	0	0	0	0	0	0		0	0	0
Arthropoda	Crustacea	Malacostraca	Eumalacostraca	Decapoda	Palaemonidae	*Palaemon* spp.	3	3	1	0	0	0	0	0	1		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Caenidae	*Caenis* spp.	2	2	1	1	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Baetidae	*Labiobaetis propinquus*	1	1	1	1	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Ephemeroptera	Heptageniidae	Heptageniidae spp.	1	1	1	1	0	0	0	1	0		0	1	0
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Coenagrionidae	*Argia* spp.	2	2	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Odonata	Coenagrionidae	*Enallagma* spp.	1	1	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera		Trichoptera spp.	1		0	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Leptoceridae	*Oecetis* spp.	1	1	1	0	1	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	Hydropsychidae spp.	2		0	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydropsychidae	*Cheumatopsyche* spp.	1	3	1	0	1	0	3	1	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Hydroptilidae	Hydroptilidae spp.	1	2	1	0	1	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Trichoptera	Philopotamidae	*Chimarra* spp.	1	1	1	0	1	0	1	1	0		0	1	0
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Elmidae	*Microcylloepus* spp.	10	10	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Coleoptera	Gyrinidae	*Dineutus* spp.	1	1	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	Chironomidae spp.	2		0	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Cladotanytarsus* spp.	2	2	1	0	0	1	0	0	0		2	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus buckleyi*	2	2	1	0	0	1	0	0	0		2	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Tanytarsus* sp. T	2	2	1	0	0	1	0	0	0		2	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum* spp.	1		0	0	0	0	0	0	0		0	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*	7	9	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Polypedilum fallax* group	2	2	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Rheotanytarsus* spp.	2	2	1	0	0	0	2	1	0		2	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Stenochironomus* spp.	4	5	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Paratanytarsus dissimilis*	2	2	1	0	0	1	0	0	0		2	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Rheocricotopus* spp.	1	1	1	0	0	0	0	0	0		0	1	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Chironomidae	*Cricotopus* or *Orthocladius*	1	1	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Simuliidae	*Simulium* spp.	16	16	1	0	0	0	16	1	0		0	1	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Empididae	*Hemerodromia* spp.	4	4	1	0	0	0	0	0	0		0	1	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Ceratopogonidae	Ceratopogoninae spp.	1	1	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Diptera	Ceratopogonidae	*Atrichopogon* spp.	4	4	1	0	0	0	0	0	0		0	0	0
Arthropoda	Hexapoda	Insecta	Pterygota	Lepidoptera	Crambidae	*Neargyractis slossonalis*	1	1	1	0	0	0	1	0	0		0	0	1
Arthropoda	Chelicerata	Arachnida	Acari	Trombidiformes	Lebertiidae	*Lebertia* spp.	1	1	1	0	0	0	0	0	0		0	1	0

Water Quality Assessment

Recent and long-term water quality data is available for McDonald Branch. The data that is available was primarily collected by the Hillsborough County Environmental Protection Commission at site 556 and Hillsborough County Environmental Services between 11/1/2017 and 9/18/2025. 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 McDonald Branch Physical Water Quality (Field) from 4/7/2025

WATER QUALITY	Depth (m)	Temp (°C)	pH (SU)	D.O. (MG/L)	D.O. Sat (%)	Cond. (µmhos/cm)	Salinity (PPT)	SECCHI (m)
Top:	0.1	18.9	7.37	7.12	76.1	193.79	0.09	0.25
Mid:								
Bottom:								

x	VOB
Total Depth	
0.25	

The chemical water quality analysis for McDonald Branch 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. Unfortunately, the sampling is insufficient with only 3 samples occurring in 2022, 2023 and 2024. The values below represent the data that is available

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 0.124 mg/L (2022), 0.125 mg/L (2023) and 0.133 mg/L (2024). The incomplete 2025 data have a geometric mean value of 0.145 mg/L. The period of record geometric mean value for total phosphorus was 0.336 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 1.196 mg/L (2022), 0.721 mg/L (2023) and 1.223 mg/L (2024). The incomplete 2025 data have a geometric mean value of 1.020 mg/L. The Total Nitrogen value from the period of record data was below the threshold with a concentration of 1.027 mg/L.

Chlorophyll-a corrected values fall below the site specific evaluation range of 3.2 µg/L to 20 µg/l for the most recent 3-years of samples (1.5 µg/L in 2022, 1.5 µg/L in 2023, 1.5 µg/L in 2024). The incomplete 2025 data have a geometric mean value of 2.3 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 1.7 µg/L.

An elevated biomass of the bacterial parameters was observed in the 3-year dataset with Escherichia Coli having a geometric mean 238 colonies/100 ml, 1,010 colonies/100 ml for Enterococci.

Table 7 McDonald Branch Water Quality (Laboratory)

Parameter	2022	2023	2024	2025	Period of Record	Units
E. Coli	143	623	73	409	429	#/100 ml
Enterococci	1,200	1,467	1,083	1,677	1,745	#/100 ml
Chlorophyll-a	1.47	1.6	1.3	2.3	1.6	µg/L
Chlorophyll-b	0.4	0.2	0.2	2.3	1.3	µg/L
Chlorophyll-c	0.7	0.6	0.6	3.0	1.2	µg/L
Chlorophyll-a Corrected	1.5	1.5	1.5	2.3	1.7	µg/L
Ammonia	0.031	0.056	0.057	0.078	0.035	mg/L
Kjeldahl Nitrogen	0.574	0.282	0.449	0.395	0.470	mg/L
Total Nitrogen	1.196	0.721	1.223	1.020	1.027	mg/L
Nitrates/Nitrites	0.635	0.495	1.016	0.631	0.648	mg/L
Total Phosphorus	0.124	0.125	0.133	0.145	0.165	mg/L

Conclusion

McDonald Branch at Thompson Road is located in a mixture of natural, residential and agricultural 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 a natural channel with stable 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 suboptimal score of 107. Disruption to the vegetation community was observed in the results of the Linear Vegetation Survey with McDonald Branch failing the percent FLEPPC metric. McDonald Branch did meet the metrics for the rapid periphyton survey with 0% of samples being ranked between 4 and 6. The recent water quality record for McDonald Branch showed concentrations of Chlorophyll-a corrected, Total Phosphorous and Total Nitrogen below the FDEP thresholds, although the sampling frequency was insufficient for calculating the numeric nutrient criteria. The results of the SCI sampling indicate that the stream is "exceptional" 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		McDonald Branch	2022	2023	2024	Threshold
Total Phosphorous (mg/l)			0.124	0.125	0.133	< 0.49
Total Nitrogen (mg/l)			1.196	0.721	1.223	< 1.65
RPS (% Rank 4-6)		0%				< 25%
LVS	**Avg C of C**	2.57				≥ 2.5
	FLEPPC %	52.6%				< 25%
Chlorophyll-a Corrected (µg/l)			1.5	1.5	1.5	< 20 µg/l
Habitat Assessment		107				> 34
SCI		72				> 34