Tall Timbers Creek EcoSummary

Sitting in a swampy valley surrounded by low hills with the stream channel marked by stepped low elevation waterfalls formed by root masses, Tall Timbers Creek is a tannic stream located in northwestern Leon County. The stream flows south under County Road 12 through the Tall Timbers Research Station and Land Conservancy, eventually entering Lake Iamonia on the north shore of the lake.

Figure 1 shows the majority of the 80-acre watershed upstream of the sample station is relatively undeveloped, with agriculture, urban and residential uses making up approximately 9% of the watershed land uses. These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

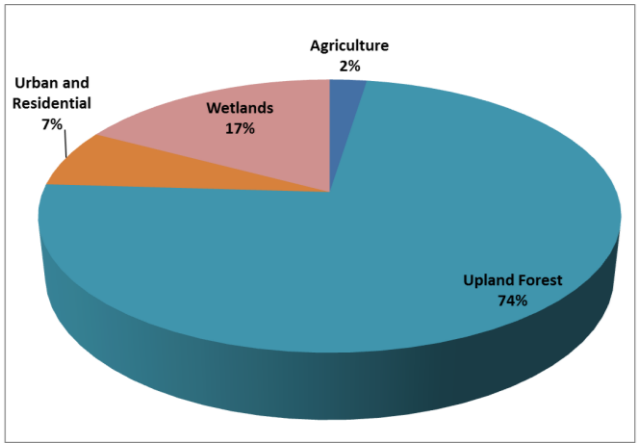

Figure 1. Tall Timbers Creek watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Tall Timbers Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Nutrients

The nutrient thresholds and results are found in **Table 1**. The NNC has never been exceeded during the period of record.

Dissolved Oxygen (DO)

As **Figure 2** shows, Tall Timbers Creek seldom met the Class III criteria for DO. Low gradient, tannic streams typically have low DO levels which can be further exacerbated by low water conditions.

Table 1. NNC Thresholds and Sample Results for Tall Timbers Creek.

Tall Timbers Creek	TN Threshold 1.03 mg/L	TP Threshold 0.18 mg/L
2006-2007*	-	-
2008	0.22	0.03
2009	0.17	0.04
2010	0.23	0.04
2011-2012*	-	-
2013	0.11	0.03
2014	0.21	0.02
2015	0.24	0.06
2016	0.13	0.02
2017	0.13	0.03
2018	0.22	0.04
2019	0.28	0.04
2020*	-	-
2021	0.14	0.03
2022	0.18	0.02
2023*	-	-

* Due to low water conditions, staff could not collect the appropriate number of samples and could not determine the NNC.

Escherichia coli (E. coli)

The *E. coli* water quality limit of > 410 in 10% of samples collected over a 30-day period was exceeded for the 2nd (650/100 mL) quarter of 2017. The September 2018 result, while relatively high (310/100 mL), did not exceed the criteria. Since the watershed is relatively undeveloped, elevated *E. coli* levels are probably the result of wildlife in the area.

Habitat Assessment and Stream Condition Index (SCI)

The results of the Habitat Assessment score (129) for Tall Timbers Creek characterizes the stream in the high suboptimal to low optimal category (**Table 2**). In keeping with the habitat assessment, the SCI categorical score was healthy in 2023 (**Table 3**). The numerical score for station 66 in 2023 was 42.58 compared to 46.21 and 61.67 in 2020 and 2017, respectively. All three of these scores are within the healthy category. This decrease in score may be related in part to the rising stream stage due to recent rains at the station, and potentially due to the season in which the samples were collected. Regardless of the nearby stage gauges exhibiting rising stream conditions, flow at Tall Timbers was not particularly large, and the areas around the "waterfalls" were relatively shallow. The physical negative conditions reported for this sampling period are like those experiences in 2020. Those conditions include silt smothering of habitats above the "waterfall" zones, notable backwater pooling in the upper portion of the reach, and significant exotic vegetation in the understory of the riparian floodplain. The two most abundant taxa collected in both SCI vials were the chironomids *Microtendipes pedellus* grp. and *Tribelos jucundum*, both FDEP sensitive species. Of the 293 invertebrates collected in the combined vials, *Microtendipes pedellus* grp accounted for 56 individuals and *Tribelos jucundum* represented 42 individuals. These two species make up 33.4% of all individuals in the sample. A total of 45 taxa were present in the overall SCI sample including representative of FDEP long-lived (one), sensitive (15), and very tolerant (five) classes. Sensitive taxa accounted for 32.6% of the taxa richness while very tolerant

taxa accounted for only 11.9%. Included in the sensitive taxa are single taxa of ephemeroptera (mayflies), and plecoptera (stoneflies), along with two taxa of trichoptera (caddisflies). In total, four EPT taxa were recovered in the 2023 SCI. Only one long-lived taxa, the plecopteran *Leuctra* sp., was present in the sample. Contributing to this low number is the absence from this years' sample of crayfish and three trichopterans, *Diplectrona modesta, Heteroplectron americanum,* and *Lype diversa* previously collected from the station. Tentatively reported in the species list, but not used in SCI calculations, is a single specimen of the tropical snail *Pyrgophorus platyrachis*. This snail is common in brackish waters and in freshwater streams connected to estuaries in south and central Florida. Finding it in a North Florida stream so far from any coastal connectivity seems highly suspect. Because the Stantec sorting lab handles many samples from stations on the Peace River, which on occasion exhibit large numbers of this species, it is possible that this occurrence at Tall Timbers is due to contamination. Stantec is instituting procedures to further reduce the potential for sample contamination.

Click here for more information about the Stream Condition Index and Habitat Assessments.

Other Parameters

Other water quality parameters appear to be normal for the area and no other impairments were noted.

Conclusions

Based on ongoing sampling, Tall Timbers Creek met the nutrient thresholds for the Panhandle East Region. While DO results did not meet Class III water quality standards, low gradient tannic streams normally have lower DO values which, in this case, were further exacerbated by the typically low flow conditions. Other water quality parameters appear to be normal for the area and no other impairments were noted. The 2023 SCI was in the Healthy range and showed the presence of a varied and reasonably rich biological community with several sensitive taxa.

Other Parameters

Other water quality parameters appear to be normal for the area and no other impairments were noted.

Table 2. Habitat Assessment results for Tall Timbers Creek.

Tall Timbers Creek	**Score**	**Category**
Substrate Diversity	14	Subptimal
Substrate Availability	12	Suboptimal
Water Velocity	12	Suboptimal
Habitat Smothering	15	Suboptimal
Artificial Channelization	20	Optimal
Bank Stability	10, 10	Optimal, Optimal
Riparian Zone Width	10, 10	Optimal, Optimal
Riparian Vegetation Quality	8, 8	Suboptimal, Suboptimal
Final Habitat Assessment Score	**129**	
Interpretation	**Suboptimal-Optimal**	

Table 3. SCI results for Tall Timbers Creek.

Tall Timbers Creek	**Rep 1**	**Rep 2**
Stream Condition Index Metrics Scores		
Total Taxa	4.29	5.71
Ephemeroptera Taxa	1.25	1.25
Trichoptera Taxa	0.00	1.11
% Filter Feeder	3.68	4.17
Long-lived Taxa	0	2
Clinger Taxa	1	0
% Dominance	6.79	8.41
% Tanytarsini Taxa	5.51	6.90
Sensitive Taxa	6	8
% Tolerant Taxa	5.48	5.09
SCI Vial Score	37.76	47.39
Stream Condition Index Score	**42.58**	
Score Interpretation	**Healthy**	

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2023.

Click here for a map of the watershed – Sample Site 66.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

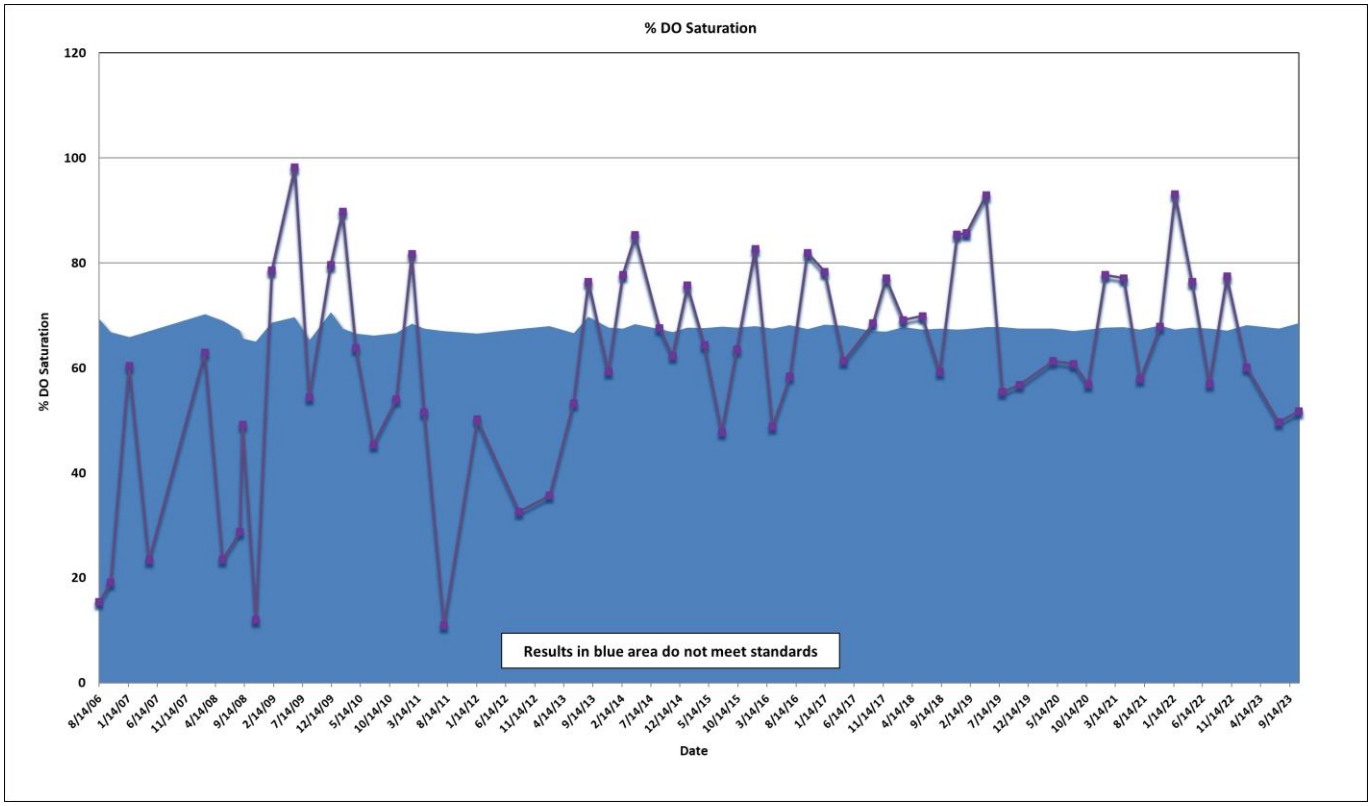

Figure 2. Dissolved Oxygen Percent Saturation results for Tall Timbers Creek.