Alabama Department of Environmental Management

Use Support Assessment Site

Rivers and Streams Monitoring Program

2019 Monitoring Summary

Poor

UT to Chattahoochee River at Cherry St in Lanett in Chambers County (32.87391/ -85.19105)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the unnamed tributary of the Chattahoochee River for biological and water quality monitoring as part of the 2019 Use Support Assessment Monitoring. The unnamed tributary was selected at the request of a local stakeholder in order to evaluate whether the creek was meeting its *F&W* use classification. Habitat and macroinvertebrate community surveys were conducted to assess the health of the biological communities on the unnamed tributary of the Chattahoochee River at TNYC-1 on April 23, 2019. Monthly water quality sampling was conducted on March through October, 2019. Metals were tested every other month in the sampling period.

Figure 1. UT of the Chattahoochee River at TNYC-1 on April 23, 2019.

Table 1. Summary of general watershed characteristics: TNYC-1.

Watershed Characteristics	
Basin	Chattahoochee
Drainage Area (mi²)	1.2
Ecoregion[o]	45b
Assessment Unit	AL03130002-0908-200
Use Class	F&W
AU Category	3
12-digit Hydrologic Unit Code (HUC)	31300020908
Landuse Categories (2021 National Land Cover Dataset)	
Open Water (%)	0.1
Forested, Total (%)	35.6
Forested, Deciduous (%)	12.5
Forested, Evergreen (%)	14.0
Forested, Mixed (%)	9.1
Shrub/Scrub (%)	0.2
Grassland/Herbaceous (%)	6.0
Pasture/Hay (%)	3.5
Developed, Total (%)	54.3
Developed, Open Space (%)	27.4
Developed, Low Intensity (%)	24.5
Developed, Medium Intensity (%)	2.4
Developed, High Intensity (%)	0.1
Population/km (2020 US Census Data)	4371

[o] Southern Outer Piedmont

Table 2. Physical characteristics of the UT to Chattahoochee River at TNYC-1, April 23, 2019.

Physical Characteristics	
Width (ft)	12
Canopy Cover	Open
Depth (ft)	
Run	0.5
Pool	1.0
% of Reach	
Run	95
Pool	5
% Substrate	
Boulder	1
Cobble	3
Gravel	5
Sand	58
Silt	30
Organic Matter	3

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. The unnamed tributary of the Chattahoochee River is a 1.24 square mile, *Fish and Wildlife (F&W)* stream located in Lanett, Alabama in Chambers county. Based on the 2021 National Land Cover Dataset, landuse within the watershed is primarily developed residential (54%), with some forested portions between residences.

REACH CHARACTERISTICS

General observations (Figure 1, Table 2) and a habitat survey (Table 3) were completed during the macroinvertebrate assessment. In comparison with reference reaches in the same ecoregion, they give an indication of the physical condition of the site and the quality and availability of habitat. Like other streams in ecoregion 45b, the unnamed tributary of the Chattahoochee River at TNYC-1 is a low gradient stream characterized predominantly by a sand substrate but contains a high amount of siltation. Overall habitat quality and availability has been rated as *Marginal* for supporting the macroinvertebrate communities due to a lack of adequate riparian zone, low instream habitat availability and quality, and high rates of sediment deposition.

BIOASSESSMENT RESULTS

The benthic macroinvertebrate community was sampled using ADEM's Intensive Multi-habitat Bioassessment methodology (WMB-I). Measures of taxonomic richness, community composition and pollution tolerance were used to assess the overall health of the macroinvertebrate community in comparison to conditions expected in central Alabama streams and rivers. Each site is placed in one of six levels ranging from 1, or *natural*, to 6, or *highly altered*. Survey results indicate the macroinvertebrate community to be in *poor* condition, with thirty-three total taxa collected. Three sensitive taxa and one highly sensitive were collected. Only two EPT taxa were present at the site, but only one organism in each taxon was collected. Forty-seven percent of the taxa collected are pollution tolerant (Table 4).

Table 3. Results of the habitat assessment survey conducted on the UT to Chattahoochee River at TNYC-1, April 23, 2019.

Habitat Survey	% Max	Rating
Instream Habitat Quality	33	Marginal (30-49.999)
Sediment Deposition	30	Marginal (30-49.999)
Sinuosity	23	Poor (0-24.999)
Bank Vegetative Stability	65	Sub-optimal (55-74.999)
Riparian Zone Measurements	5	Poor (0-24.999)
Habitat Assessment Score	**58**	
% Maximum Score	**32**	**Marginal (25-39.999)**

Table 4. Results of the macroinvertebrate survey conducted on the UT to Chattahoochee River at TNYC-1, April 23, 2019.

Macroinvertebrate Assessment	Results	Scores
Taxonomic richness and diversity metrics		
Taxa Count	33	33
# rare and highly sensitive taxa	1	1
# sensitive taxa	3	3
# sensitive EPT taxa	0	0
Percent taxon metrics		
% rare and highly sensitive taxa	3	3
% sensitive taxa	9	9
% sensitive EPT taxa	0	0
% highly tolerant taxa	27	27
Percent individual metrics		
% rare and highly sensitive individuals	2	2
% sensitive individuals	4	4
% sensitive EPT individuals	0	0
% tolerant individuals	47	47
WMB-I Survey Score		**5.0**
WMB-I Survey Rating		**Poor (4.85-5.149)**

WATER CHEMISTRY

Results of water chemistry analyses are summarized in Table 5. In situ measurements and water samples were collected monthly during March through October 2019 to help identify any stressors to the biological communities. Individual zinc and pH values were higher than all verified ecoregional reference reach data collected in the ecoregion 45b. Median total dissolved solids, specific conductance, hardness, alkalinity, nitrate-nitrite nitrogen, and chlorides values were higher than the median concentration of all verified ecoregional reference reach data collected in ecoregion 45b. E. coli exceeded the *F&W* human health criteria for 14 individual sampling events. Both the summer and winter geometric mean samples exceeded the human health criteria for the *F&W* use class.

Table 5. Summary of water quality data collected March-October, 2019. Minimum (Min) and maximum (Max) values calculated using minimum detection limits (MDL) whenever results were less than this value. Median (Med), average (Avg), and standard deviation

	TNYC-1 AL03130002-0908-200	N	Min	Max	Med	Avg	SD	E	10thP	90thP
	Physical									
	Temperature (°C)	18	11.8	30.2	25.2	23.9	4.9		13.2	29.6
	Turbidity (NTU)	18	3.0	29.9	6.5	7.6	5.8		3.4	19.6
J	Total Dissolved Solids (mg/L)	8	58.0	97.0	76.5[M]	78.1	15.0		58.0	97.0
J	Total Suspended Solids (mg/L)	8	1.0	8.0	2.5	3.4	2.5		1.0	8.0
	Specific Conductance (µmhos/cm)	18	91.8	161.8	127.4[G]	127.3	19.8		94.9	160.4
	Hardness (mg/L)	4	35.4	47.3	43.8[G]	42.6	5.5		35.4	47.3
	Alkalinity (mg/L)	8	33.3	59.3	48.0[M]	46.3	7.9		33.3	59.3
	Measured Stream Flow (cfs)	13	0.2	1.8	0.8	0.8	0.5		0.2	1.7
	Chemical									
	Dissolved Oxygen (mg/L)	18	7.5	10.9	8.8	8.9	0.9		7.6	10.6
	pH (SU)	18	6.7[D]	7.5	6.9	7.0	0.3	2	6.7	7.5
J	Ammonia Nitrogen (mg/L)	8	<0.004	0.030	0.008	0.010	0.009		0.002	0.030
	Nitrate+Nitrite Nitrogen (mg/L)	8	0.347	0.707	0.510[M]	0.518	0.158		0.347	0.707
	Total Kjeldahl Nitrogen (mg/L)	8	<0.075	0.239	0.100	0.107	0.064		0.038	0.239
	Total Nitrogen (mg/L)	8	<0.384	0.946	0.610	0.625	0.211		0.384	0.946
J	Dis Reactive Phosphorus (mg/L)	8	0.005	0.008	0.006	0.006	0.001		0.005	0.008
J	Total Phosphorus (mg/L)	8	0.007	0.017	0.011	0.011	0.004		0.007	0.017
J	CBOD-5 (mg/L)	8	<2.0	<2.0	1.0	1.0	0.0		1.0	1.0
	Chlorides (mg/L)	8	4.7	8.9	6.4[M]	6.4	1.4		4.7	8.9
	Sulfate (mg/L)	8	1.95	2.84	2.28	2.37	0.37		1.95	2.84
	Total Metals									
J	Aluminum (T) (mg/L)	4	<0.023	0.151	0.058	0.070	0.058		0.012	0.151
	Iron (T) (mg/L)	4	0.489	0.656	0.604	0.588	0.071		0.489	0.656
J	Manganese (T) (mg/L)	4	0.068	0.209	0.100	0.120	0.067		0.068	0.209
	Dissolved Metals									
	Aluminum (mg/L)	3	<0.023	<0.023	0.012	0.012	0.000		0.012	0.012
	Antimony (µg/L)	4	<1.480	<1.480	0.740	0.740	0.000		0.740	0.740
	Arsenic (µg/L)	4	<0.689	<0.689	0.344	0.344	0.000		0.344	0.344
	Cadmium (µg/L)	4	<0.726	<0.726	0.363	0.363	0.000		0.363	0.363
	Chromium (µg/L)	4	<0.793	<0.793	0.396	0.396	0.000		0.396	0.396
	Copper (µg/L)	4	<1.190	<1.190	0.595	0.595	0.000		0.595	0.595
	Iron (mg/L)	3	0.278	0.484	0.286	0.349	0.117		0.278	0.484
	Lead (µg/L)	4	<0.697	<0.697	0.348	0.348	0.000		0.348	0.348
J	Manganese (mg/L)	3	<0.004	0.120	0.060	0.061	0.059		0.002	0.120
	Nickel (µg/L)	4	<1.960	<1.960	0.980	0.980	0.000		0.980	0.980
	Selenium (µg/L)	4	<1.900	<1.900	0.950	0.950	0.000		0.950	0.950
	Silver (µg/L)	4	<1.350	<1.350	0.675	0.675	0.000		0.675	0.675
	Thallium (µg/L)	4	<0.641	<0.641	0.320	0.320	0.000		0.320	0.320
J	Zinc (µg/L)	4	<2.340	4.850[D]	2.590	2.800	1.913		1.170	4.850
	Biological									
	Chlorophyll a (mg/m³)	8	<0.10	3.20	0.50	0.92	0.98		0.05	3.20
	E. coli (MPN/DL)	17	148.3	1203.3[H]	686.7	698.1	290.0	14	219.6	1161.6
	2019 - E. coli Summer	5				742.4				
	2019 - E. coli Winter	4				587.8				

H=*F&W* human health criterion exceeded; D=an individual value >90% of all verified ecoregional reference reach data collected in the ecoregion 45b; E=# samples that exceeded criteria; J=estimate; M=value >90% of all verified ecoregional reference reach data collected in the ecoregion 45b; G= value higher than median concentration of all verified ecoregional reference reach data collected in the ecoregion 45b; N=# samples.

SUMMARY

The unnamed tributary of the Chattahoochee River at TNYC-1 was chosen by the ADEM to evaluate whether the stream was meeting it's water use classification criteria. Overall habitat quality and availability was rated as *Marginal* for supporting the macroinvertebrate communities and the condition of the macroinvertebrate communities was rated as *Poor*. Individual zinc and pH values were higher than all verified ecoregional reference reach data collected in the ecoregion 45b. Median total dissolved solids, specific conductance, hardness, alkalinity, nitrate-nitrite nitrogen and chlorides values were higher than the median concentration of all verified ecoregional reference reach data collected in ecoregion 45b. E. coli exceeded the *F&W* human health criteria for 14 individual sampling events. Both the summer and winter geometric mean samples exceeded the human health criteria for the *F&W* use class. These results indicate highly degraded conditions for this small, Southern Outer Piedmont stream.

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