Alabama Department of Environmental Management

Basin Assessment Site

Rivers and Streams Monitoring Program

2006 Monitoring Summary

Fair™

Tallahatta Creek at Wood Bluff Road in Clark County (31.92425/-87.99374)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the Tallahatta Creek watershed for biological and water quality monitoring as part of the 2006 Assessment of the Escatawpa, Mobile, and Lower Tombigbee (EMT) River Basins. The objectives of the EMT Basin Assessments were to assess the biological integrity of each monitoring site and to estimate overall water quality within the EMT basin group.

Additionally, Tallahatta Creek is among the least-disturbed watersheds in the EMT based on landuse, road density, and population density. These data will be used to evaluate the use of Tallahatta Creek as a "best attainable" condition reference watershed for comparison with other coastal plain streams.

Figure 1. Tallahatta Creek at TLHC-1, January 2010.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Tallahatta Creek is a *Fish & Wildlife (F&W)* stream in Clarke County. This watershed falls within the Southern Hilly Gulf Coastal Plain (Griffith et al. 2001). Land cover within the watershed is mainly forest (83%) with some areas of shrub/scrub, woody wetland, and pasture/hay. Population density is very low within the watershed.

REACH CHARACTERISTICS

General observations (Table 2) and a habitat assessment (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, as well as the quality and availability of habitat. Tallahatta Creek at TLHC-1 is a low-gradient, sand-bottomed stream (Fig. 1). The habitat assessment conducted on May 25, 2006 categorized the stream as *marginal* due to poor sinuosity, poor bank and vegetative stability, and marginal instream habitat quality.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin		Lower Tombigbee
Drainage Area (mi^2)		34
Ecoregion[a]		65d
% Landuse		
Open water		<1
Wetland	Woody	5
	Emergent herbaceous	<1
Forest	Deciduous	15
	Evergreen	55
	Mixed	13
Shrub/scrub		8
Grassland/herbaceous		<1
Pasture/hay		2
Cultivated crops		1
Development	Open space	1
	Low intensity	<1
Population/km^2[b]		3
# NPDES Permits[c]	**TOTAL**	0

a.Southern Hilly Gulf Coastal Plain

b.2000 US Census

c.#NPDES permits downloaded from ADEM's NPDES Management System database, 18 Sep 2009

Table 2. Physical characteristics of Tallahatta Creek at TLHC-1, May 25, 2006.

Physical Characteristics		
Width (ft)		20
Canopy cover		Est. 50/50
Depth (ft)	Run	1.0
	Pool	3.0
% of Reach	Run	60
	Pool	40
% Substrate	Bedrock	1
	Cobble	5
	Gravel	10
	Sand	69
	Silt	5
	Organic Matter	10

BIOASSESSMENT RESULTS

Benthic macroinvertebrate communities were sampled using ADEM's Intensive Multi-habitat Bioassessment methodology (WMB-I). The WMB-I uses measures of taxonomic richness, community composition, and community tolerance to assess the overall health of the macroinvertebrate community. Each metric is scored on a 100 point scale. The final score is an average of the score for each metric. Metric results indicated the macroinvertebrate community in Tallahatta Creek at TLHC-1 to be in *fair* condition (Table 4).

Table 3. Results of the habitat assessment conducted on Tallahatta Creek at TLHC-1, May 25, 2006.

Habitat Assessment (% Maximum Score)		Rating
Instream habitat quality	51	Marginal (40-52)
Sediment deposition	56	Sub-optimal (53-65)
Sinuosity	40	Poor (<45)
Bank and vegetative stability	33	Poor (<35)
Riparian buffer	85	Sub-optimal (70-90)
Habitat assessment score	116	
% Maximum score	**53**	**Marginal (40-52)**

Table 4. Results of the macroinvertebrate bioassessment of Tallahattee Creek at TLHC-1 conducted on May 25, 2006.

Macroinvertebrate Assessment			
	Results	**Scores**	**Rating**
Taxa richness measures			
# EPT genera	25	100	Excellent (>78)
Taxonomic composition measures			
% Non-insect taxa	10	74	Fair (61.8-92.7)
% Plecoptera	1	3	Poor (1.86-3.7)
% Dominant taxa	20	76	Good (70.5-85.2)
Functional composition measures			
% Predators	4	2	Very Poor (<15.1)
Tolerance measures			
Beck's community tolerance index	11	50	Good (31.8-65.9)
% Nutrient tolerant organisms	38	53	Fair (50.8-76.2)
WMB-I Assessment Score	**---**	**51**	**Fair (37-56)**

WATER CHEMISTRY

Results of water chemistry are presented in Table 5. Samples were collected monthly, semi-monthly (metals), or quarterly (pesticides, herbicides (atrazine), and semi-volatile organics), during March through October of 2006. Dissolved metals, including aluminum, iron, manganese, nickel, and thallium, resulted in higher concentrations than was expected based on the 90th percentile of reference reach data collected in ecoregion 65d.

CONCLUSIONS

Bioassessment results indicated the macroinvertebrate community in Tallahatta Creek at TLHC-1 to be in *fair* condition. Overall habitat quality was categorized as *marginal* due to a lack of instream habitat and unstable banks. Dissolved metals including aluminum, iron, manganese, nickel, and thallium were parameters of concern at this reach.

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Table 5. Summary of water quality data collected March-October, 2006. Minimum (Min) and maximum (Max) values calculated using minimum detection limits (MDL) when results were less than this value. Median, average (Avg), and standard deviations (SD) values were calculated by multiplying the MDL by 0.5 when results were less than this value.

Parameter	N	Min	Max	Median	Avg	SD
Physical						
Temperature (ºC)	9	17.0	29.0	23.0	22.3	4.0
Turbidity (NTU)	9	7.1	15.8	11.9	11.5	2.7
Total Dissolved Solids (mg/L)	8	< 1.0	125.0	104.0	91.9	39.6
Total Suspended Solids (mg/L)	8	1.0	12.0	2.8	4.8	4.2
Specific Conductance (µmhos)	9	91.8	139.5	119.1	118.7	14.6
Hardness (mg/L)	3	40.0	63.0	62.0	55.0	13.0
Alkalinity (mg/L)	8	23.4	52.0	35.4	37.4	10.0
Stream Flow (cfs)	6	2.4	23.4	5.7	7.9	—
Chemical						
Dissolved Oxygen (mg/L)	9	6.2	9.2	7.6	7.7	0.9
pH (su)	9	6.9	7.4	7.1	7.2	0.2
Ammonia Nitrogen (mg/L)	8	< 0.01	0.015	0.008	0.007	0.001
Nitrate+Nitrite Nitrogen (mg/L)	8	< 0.003	0.038	0.003	0.011	0.015
Total Kjeldahl Nitrogen (mg/L)	8	< 0.150	0.510	0.384	0.329	0.184
Total Nitrogen (mg/L)	8	0.077	0.531	0.386	0.341	0.183
Dissolved Reactive Phosphorus (mg/L)	8	< 0.004	0.012	0.006	0.007	0.004
Total Phosphorus (mg/L)	8	0.013	0.077	0.065	0.058	0.021
CBOD-5 (mg/L)	8	< 1.0	3.2	1.3	1.3	0.9
Chlorides (mg/L)	8	< 1.4	6.8	3.0	3.8	2.1
Atrazine (µg/L)	1	< 0.05	< 0.05	0.03	0.03	0.0
Total Metals						
Aluminum (mg/L)	3	0.24	0.4	0.29	0.31	0.082
Iron (mg/L)	3	2.04	2.6	2.3	2.313	0.28
Manganese (mg/L)	3	0.068	0.099	0.074	0.080	0.016
Dissolved Metals						
Aluminum (mg/L)	3	0.05	0.2	0.160[M]	0.137	0.078
Antimony (µg/L)	3	< 7.5	< 7.5	3.8	3.8	0.0
Arsenic (µg/L)	3	< 5	< 5	2.5	2.5	0.0
Cadmium (mg/L)	3	< 0.0	< 0.0	0.0	0.0	0.0
Chromium (mg/L)	3	< 0.005	< 0.005	0.003	0.003	0.0
Copper (mg/L)	3	< 0.005	< 0.005	0.003	0.003	0.0
Iron (mg/L)	3	0.810	2.180	0.89[M]	1.293	0.769
Lead (µg/L)	3	< 5	< 5	2.5	2.5	0.0
Manganese (mg/L)	3	0.043	0.09	0.069[M]	0.067	0.024
Mercury (µg/L)	3	< 0.5	< 0.5	0.3	0.3	0.0
Nickel (mg/L)	3	< 0.005	0.032	0.009[M]	0.0145	0.016
Selenium (µg/L)	3	< 7.5	< 7.5	3.8	3.8	0.0
Silver (mg/L)	3	< 0.001	< 0.001	0.0	0.0	0.0
Thallium (µg/L)	3	< 2.5	9	4.5[M]	3.4	1.9
Zinc (mg/L)	3	< 0.005	< 0.005	0.003	0.003	0.0
Biological						
Chlorophyll a (µg/L)	8	< 1.00	5.34	1.60	2.13	1.77
[J] Fecal Coliform (col/100 mL)	5	10	260	70	90	101

N=# of samples; J=estimate; M=value > 90th percent of ADEM's 65d reference reach samples.