

# 2011 Monitoring Summary



Basin Assessment Site

## Yantley Creek at AL Hwy 17 in Choctaw County (32.21387/-88.16678)

### BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the Yantley Creek watershed for biological and water quality monitoring as part of the 2011 Escatawpa, Mobile, Tombigbee (EMT) Basin Assessment Monitoring. 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 basin group.

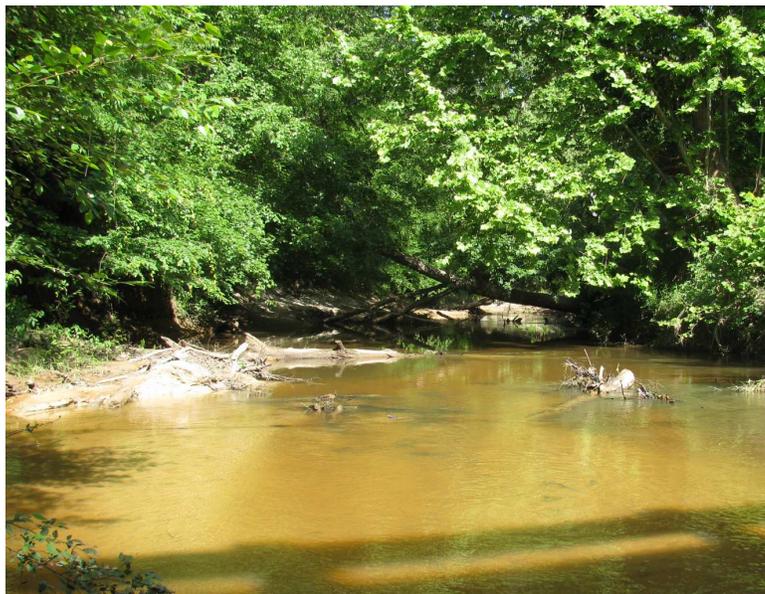


Figure 1. Yantley Creek at YNTC-10, May 18, 2011.

### WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Located in Choctaw County, Yantley Creek from Tuckabum Creek to Alabama-Mississippi State line is designated as *Fish & Wildlife (F&W)* stream. Based on the 2006 National Land Cover Dataset, landuse within the watershed is primarily forest (69%), interspersed with shrub/scrub. Population density is very low in this area. As of September 4, 2012, three NPDES permit have been issued in this 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 and the quality and availability of habitat. Yantley Creek at YNTC-10 is a low gradient stream typical of Southern Hilly Coastal Plain, dominated by sand (Figure 1). The reach is characterized by a more or less straight channel with unstable banks with an overall habitat assessment score of *sub-optimal*.

### BIOASSESSMENT RESULTS

Benthic macroinvertebrate communities were sampled using ADEM's Intensive Multi-habitat Bioassessment methodology (WMB-I). Table 4 summarizes results of taxonomic richness, community composition, and community tolerance metrics. Each metric is scored on a 100 point scale. The final score is the average of all individual metric scores. Metric results indicated the macroinvertebrate community in Yantley Creek at YNTC-10 to be in *fair* condition.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin	Lower Tombigbee River	
Drainage Area (mi <sup>2</sup> )	45	
Ecoregion <sup>a</sup>	65d	
% Landuse		
Open water		<1
Wetland	Woody	11
	Emergent herbaceous	<1
Forest	Deciduous	25
	Evergreen	26
	Mixed	18
Shrub/scrub		11
Grassland/herbaceous		4
Pasture/hay		2
Cultivated crops		<1
Development	Open space	3
	Low intensity	<1
Population/km <sup>2</sup> <sup>b</sup>	5	
# NPDES Permits <sup>c</sup>		
	TOTAL	3
	Construction Stormwater	2
	Industrial General	1

a.Southern Hilly Gulf Coastal Plain

b.2000 US Census

c.#NPDES permits downloaded from ADEM's NPDES Management System

Table 2. Physical characteristics of Yantley Creek at YNTC-10, May 18, 2011.

Physical Characteristics	
Canopy Cover	Estimate 50/50
Width (ft)	27
Depth (ft)	
	Run 0.8
	Pool 3.5
% of Reach	
	Run 60
	Pool 40
% Substrate	
	Sand 84
	Silt 5
	Organic Matter 11

Table 3. Results of the habitat assessment conducted on Yantley Creek at YNTC-10, May 18, 2011.

Habitat Assessment	%Maximum Score	Rating
Instream Habitat Quality	51	Marginal (40-52)
Sediment Deposition	63	Sub-optimal (53-65)
Sinuosity	40	Poor <45
Bank and Vegetative Stability	23	Poor <35
Riparian Buffer	81	Sub-optimal (70-89)
<b>Habitat Assessment Score</b>	<b>120</b>	
<b>% Maximum Score</b>	<b>54</b>	<b>Sub-optimal (53-65)</b>

**Table 4.** Results of the macroinvertebrate bioassessment conducted in Yantley Creek at YNTC-10, May 18, 2011.

Macroinvertebrate Assessment		
	Results	Scores (0-100)
<b>Taxa richness and diversity measures</b>		
% EPC taxa	34	64
% Dominant Taxon	28	55
<b>Taxonomic composition measures</b>		
% EPT minus Baetidae and Hydropsychidae	0	0
<b>Functional feeding group</b>		
# Collector Taxa	23	80
<b>Community tolerance</b>		
% Nutrient Tolerant individuals	52	21
<b>WMB-I Assessment Score</b>	---	<b>44</b>
<b>WMB-I Assessment Rating</b>		<b>Fair (32-47)</b>

## WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 5. In situ measurements and water samples were collected in March, May, July, and September, 2011 to help identify any stressors to the biological communities. *In situ* parameters suggested that Yantley Creek at YNTC-10 was meeting *F&W* use classification. Almost all metals were below the detection limits. No pesticides, semi-volatile organics or atrazine were detected in any of the sampling events.

## SUMMARY

Yantley Creek at YNTC-10 was typical of other streams in the Southern Hilly Gulf Coastal Plains, which are generally low-gradient streams with sand substrates (Griffith et al. 2001). Results of the habitat assessment suggested that in-stream habitat was fairly good for supporting biological communities. Bioassessment results indicated the macroinvertebrate community to be in *fair* condition.

**Table 5.** Summary of water quality data collected March-September, 2011. Minimum (Min) and maximum (Max) values calculated using minimum detection limits (MDL). 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	Med	Avg	SD	Q
<b>Physical</b>							
Temperature (°C)	4	15.4	24.1	21.5	20.6	3.7	
Turbidity (NTU)	5	11.8	187.0	19.7	53.3	75.3	
Total Dissolved Solids (mg/L)	4	66.0	114.0	89.0	89.5	20.0	
Total Suspended Solids (mg/L)	4	6.0	144.0	22.5	48.8	64.1	
Specific Conductance (µmhos)	4	63.9	135.5	112.3	106.0	30.2	
Hardness (mg/L)	4	6.2	28.9	19.3	18.4	9.9	
Alkalinity (mg/L)	4 <	2.4	56.5	28.5	28.7	24.6	
Stream Flow (cfs)	3	23.5	32.5	24.8	26.9	4.9	
<b>Chemical</b>							
Dissolved Oxygen (mg/L)	4	6.9	8.4	7.5	7.6	0.6	
pH (su)	4	6.6	7.0	6.8	6.8	0.2	
Ammonia Nitrogen (mg/L)	4 <	0.005	0.058	0.020	0.025	0.024	J
Nitrate+Nitrite Nitrogen (mg/L)	4	0.033	0.085	0.049	0.054	0.022	
Total Kjeldahl Nitrogen (mg/L)	4	0.276	0.508	0.380	0.386	0.102	
Total Nitrogen (mg/L)	4	0.321	0.593	0.424	0.440	0.117	
Dissolved Reactive Phosphorus (mg/L)	4	0.010	0.021	0.012	0.014	0.005	
Total Phosphorus (mg/L)	4	0.042	0.073	0.060	0.059	0.016	
CBOD-5 (mg/L)	4 <	2.0	2.2	1.0	1.3	0.6	J
Chlorides (mg/L)	4	0.9	4.8	3.7	3.3	1.8	
Atrazine (µg/L)	2 <	0.02	< 0.02	0.01	0.01	0.00	
<b>Total Metals</b>							
Aluminum (mg/L)	4	0.350	1.330	0.578	0.709	0.446	
Iron (mg/L)	4	1.310	2.480	2.190	2.042	0.510	
Manganese (mg/L)	4	0.080	0.171	0.107	0.116	0.041	
<b>Dissolved Metals</b>							
Aluminum (mg/L)	4 <	0.043	0.266	0.049	0.096	0.116	J
Antimony (µg/L)	4 <	1.9	< 1.9	0.9	0.9	0.0	
Arsenic (µg/L)	4 <	1.4	< 1.4	0.7	0.7	0.0	
Cadmium (mg/L)	4 <	0.000	< 0.000	0.000	0.000	0.000	
Chromium (mg/L)	4 <	0.009	< 0.009	0.004	0.004	0.000	
Copper (mg/L)	4 <	0.020	< 0.020	0.010	0.010	0.000	
Iron (mg/L)	4	0.294	1.080	0.566	0.626	0.370	
Lead (µg/L)	4 <	0.9	< 0.9	0.5	0.5	0.0	
Manganese (mg/L)	4	0.049	0.134	0.068	0.080	0.038	J
Mercury (µg/L)	4 <	0.035	< 0.035	0.018	0.018	0.000	
Nickel (mg/L)	4 <	0.042	< 0.042	0.021	0.021	0.000	
Selenium (µg/L)	4 <	1.3	< 1.3	0.7	0.7	0.0	
Silver (mg/L)	4 <	0.000	< 0.000	0.000	0.000	0.000	
Thallium (µg/L)	4 <	1.1	< 1.1	0.5	0.5	0.0	
Zinc (mg/L)	4 <	0.012	< 0.012	0.006	0.006	0.000	
<b>Biological</b>							
Chlorophyll a (ug/L)	4 <	0.10	2.29	0.56	0.86	1.06	
E. coli (col/100mL)	4	108	2420	375	819	1078	

J=estimate; N=# samples; Q=qualifier.

FOR MORE INFORMATION, CONTACT:  
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