

2013 Monitoring Summary



Yantley Creek at Choctaw County Road 7 (32.22062/-88.27242)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) monitored Yantley Creek as part of its 2006 and 2011 Basin Assessments of the Escatawpa, Mobile, and Tombigbee Rivers. Monitoring of Yantley Creek continued in 2013 to provide additional biological, chemical, and physical data to fully assess the use support status for the 2016 Integrated Water Quality Report.



Figure 1. Yantley Creek at YNTC-1, May 29, 2013.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Yantley Creek is a *Fish & Wildlife (F&W)* stream located in the Southern Hilly Gulf Coastal Plain (65d) ecoregion. Based on the 2006 National Land Cover Dataset, landuse within the watershed is predominantly forest (71%). As of September 1, 2012, one outfall was active 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 and the quality and availability of habitat. Yantley Creek at YNTC-1 is a low-gradient, glide-pool stream with substrate composed primarily of sand and organic matter (Figure 1). Overall habitat quality and availability was rated as *sub-optimal* for supporting diverse aquatic macroinvertebrate communities.

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 the average of all individual metric scores. Metric results indicated the macroinvertebrate community to be in *fair* condition (Table 4).

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin	Lower Tombigbee	
Drainage Area (mi²)	28	
Ecoregion^a	65d	
% Landuse		
Open water		<1
Wetland	Woody	8
	Emergent herbaceous	<1
Forest	Deciduous	24
	Evergreen	28
	Mixed	19
Shrub/scrub		14
Grassland/herbaceous		<1
Pasture/hay		3
Cultivated crops		1
Development	Open space	2
	Low intensity	<1
Population/km^{2b}	4	
# NPDES Permits^c	TOTAL	1
Construction Stormwater		1

a.Southern Hilly Gulf Coastal Plain

b.2000 US Census

c.#NPDES permits downloaded from ADEM's NPDES Management System database, September 1, 2012.

Table 2. Physical characteristics of Yantley Creek at YNTC-1, June 25, 2013.

Physical Characteristics	
Width (ft)	20
Canopy Cover	Mostly Shaded
Depth (ft)	
Run	3.0
Pool	4.0
% of Reach	
Run	20
Pool	80
% Substrate	
Clay	5
Cobble	1
Mud/Muck	2
Hard Pan Clay	2
Sand	55
Silt	5
Organic Matter	30

Table 3. Results of the habitat assessment conducted on Yantley Creek at YNTC-1, June 25, 2013.

Habitat Assessment	% Maximum Score	Rating
Instream Habitat Quality	59	Sub-optimal (53-65)
Sediment Deposition	69	Optimal (>65)
Sinuosity	70	Sub-optimal (65-84)
Bank and Vegetative Stability	38	Marginal (35-59)
Riparian Buffer	88	Sub-optimal (70-89)
Habitat Assessment Score	143	
% Maximum Score	65	Sub-optimal (53-65)

Table 4. Results of the macroinvertebrate bioassessment conducted in Yantley Creek at YNTC-1, June 25, 2013.

Macroinvertebrate Assessment		
		Results
Taxa richness and diversity measures		
	# EPT taxa	15
Taxonomic composition measures		
	% Non-insect taxa	11
	% Plecoptera	0
	% Dominant taxon	22
Functional feeding group		
	% Predators	20
Community tolerance		
	Becks community tolerance index	1
	% Nutrient tolerant individuals	37
	WMB-I Assessment Score	47
	WMB-I Assessment Rating	Fair (37-55)

Table 5. Summary of water quality data collected March-October, 2013. 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	E
Physical							
Temperature (°C)	9	11.0	24.4	23.0	20.3	4.5	
Turbidity (NTU)	9	8.7	284.0	16.4	57.8	93.1	
† Total Dissolved Solids (mg/L)	8	71.0	108.0	87.0	89.9	14.3	
Total Suspended Solids (mg/L)	8	< 1.0	322.0	5.5	66.0	120.8	
Specific Conductance (µmhos)	9	25.0	116.0	77.5	74.8	31.1	
† Alkalinity (mg/L)	8	3.0	48.1	27.4	26.2	16.4	
Stream Flow (cfs)	6	2.6	9.0	5.8	5.8	2.5	
Chemical							
Dissolved Oxygen (mg/L)	9	5.6	10.0	6.7	7.3	1.4	
pH (su)	9	4.9 ^c	7.0	6.7	6.5	0.6	1
† Ammonia Nitrogen (mg/L)	8	0.011	0.077	0.009	0.018	0.024	
† Nitrate+Nitrite Nitrogen (mg/L)	8	< 0.004	0.045	0.023	0.023	0.012	
† Total Kjeldahl Nitrogen (mg/L)	8	0.067	1.250	0.408	0.446	0.379	
† Total Nitrogen (mg/L)	8	0.081	1.295	0.434	0.468	0.380	
† Dissolved Reactive Phosphorus (mg/L)	7	0.006	0.016	0.014	0.012	0.004	
Total Phosphorus (mg/L)	8	0.031	0.082	0.058	0.058	0.018	
† CBOD-5 (mg/L)	8	< 2.0	< 2.0	1.0	1.0	0.0	
Chlorides (mg/L)	8	1.3	3.4	3.0	2.7	0.8	
Biological							
Chlorophyll a (µg/L)	8	< 0.10	2.87	0.05	0.62	0.95	

C=F&W use class criterion exceeded; E=# samples that exceeded criteria; J=estimate; N=# samples.

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 5. In situ measurements and water samples were collected March through October of 2013 to help identify any stressors to the biological communities. Stream pH was below F&W use criteria for one out of eight sampling events.

SUMMARY

Bioassessment results indicated the macroinvertebrate community to be in *fair* condition. Overall habitat quality was categorized as *sub-optimal*. The results from this report will be used to fully assess the use support status of Yantley Creek for the 2016 Integrated Water Quality Report.

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