Alabama Department of Environmental Management

Basin Assessment Program

Rivers and Streams Monitoring Program

2007 Monitoring Summary

Fair

Old Town Creek at Alabama Highway 175 (Perry County) (32.71137/-87.27714)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the Old Town Creek watershed for biological and water quality monitoring as part of the 2007 Assessment of the Black Warrior/Cahaba River Basins. The objectives of the Black Warrior/ Cahaba River Basin Assessments were to assess the biological integrity of each monitoring site and to estimate overall water quality within the basin.

Figure 1. Old Town Creek at OTCP-1, August 16, 2007

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Old Town Creek at OTCP-1 is a small *Fish & Wildlife (F&W)* stream near Marion, Alabama in Perry County. Based on the 2000 National Land Cover Dataset, landuse within the watershed is mostly forest (84%). ADEM has issued five NPDES permits in the watershed as of February 23, 2011.

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. Old Town Creek at OTCP-1 is a shallow, low-gradient tributary of the Cahaba River characterized by a sandy substrate (Figure 1). Overall habitat quality was categorized as *sub-optimal*. In stream habitat was rated as *poor*.

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. The final score indicated the biological community to be in *fair* condition (Table 4) due to the low number of pollution-intolerant macroinvertebrate genera.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin		Cahaba River
Drainage Area (mi^2)		32
Ecoregion[a]		65i
% Landuse		
Open water		0
Wetland	Woody	2
	Emergent herbaceous	0
Forest	Deciduous	27
	Evergreen	30
	Mixed	27
Shrub/scrub		8
Grassland/herbaceous		<1
Pasture/hay		1
Cultivated crops		1
Development	Open space	3
	Low intensity	<1
	Moderate intensity	<1
Population/km^2[b]		<1
# NPDES Permits[c]	**TOTAL**	5
Construction Stormwater		5

a.Fall Line Hills

b.2000 US Census

c.#NPDES permits downloaded from ADEM's NPDES Management System database, 9 Jun 2008

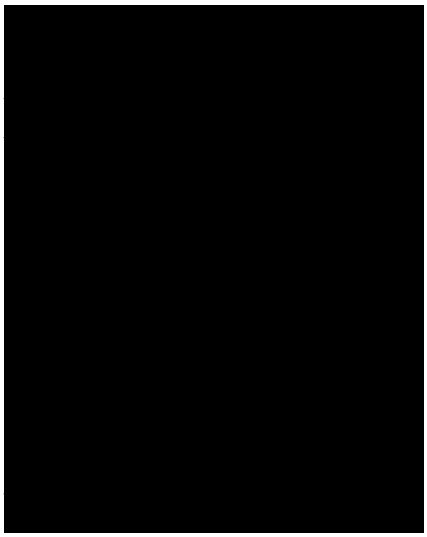

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Table 3. Results of the habitat assessment conducted in Old Town Creek at OTCP-1 on May 2, 2007.

Habitat Assessment	%Maximum Score	Rating
Instream Habitat Quality	30	Poor <40
Sediment Deposition	63	Sub-optimal (53-65)
Sinuosity	45	Marginal (45-64)
Bank and Vegetative Stability	55	Marginal (35-59)
Riparian Buffer	88	Sub-optimal (70-89)
Habitat Assessment Score	**120**	
% Maximum Score	**55**	**Sub-optimal (53-65)**

Table 4. Results of the macroinvertebrate bioassessment conducted in Old Town Creek at OTCP-1 on May 2, 2007.

Macroinvertebrate Assessment			
	Results	**Scores**	**Rating**
Taxa richness measures			
# EPT genera	10	40	Fair (38-56)
Taxonomic composition measures			
% Non-insect taxa	8	84	Fair (61.9-92.7)
% Plecoptera	3	13	Good (5.7-52.8)
% Dominant taxa	16	85	Good (70.6-85.2)
Functional composition measures			
% Predators	21	73	Excellent (>72.1)
Tolerance measures			
Beck's community tolerance index	1	5	Very Poor (<10.6)
% Nutrient tolerant organisms	29	68	Fair (50.9-76.2)
WMB-I Assessment Score	**--**	**52**	**Fair (38-56)**

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 5. In situ measurements and water samples were collected monthly, during March through October of 2007. Metals and organics were sampled in May and July. Hardness and specific conductance were higher than expected for this ecoregion, based on data collected at ADEM's least impaired reference reaches. All other parameters were within expected ranges.

SUMMARY

Bioassessment results indicated the macroinvertebrate community in Old Town Creek at OCTP-1 to be in *fair* condition. Hardness and specific conductance were higher than expected for this ecoregion as compared to data from ADEM's least impaired reference reaches. Additionally, in stream habitat was limited within the reach. ADEM will continue to review the information presented in this report along with all other available data.

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Table 5. Summary of water quality data collected March-October, 2007. 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	Med	Avg	SD
Physical						
Temperature(°C)	9	14.6	23.8	18.7	19.0	2.1
Turbidity (NTU)	9	3.8	12.8	7.3	7.2	2.7
Total Dissolved Solids (mg/L)	8	17.0	50.0	33.5	33.4	13.4
Total Suspended Solids (mg/L)	8	1.2	11.0	3.5	4.6	3.4
Specific Conductance (µmhos)	9	0.0	43.5	42.5[G]	37.1	14.0
Hardness (mg/L)	2	15.0	15.5	15.2[G]	15.2	0.4
Alkalinity (mg/L)	8	7.3	14.2	11.8	11.5	2.1
Stream Flow (cfs)	9	2.2	10.5	3.2	4.3	2.7
Chemical						
Dissolved Oxygen (mg/L)	9	7.8	9.9	8.8	8.8	0.7
pH (su)	9	6.7	7.2	7.0	6.1	0.2
Ammonia Nitrogen (mg/L)	8	< 0.015	< 0.015	0.008	0.008	0.000
Nitrate+Nitrite Nitrogen (mg/L)	8	0.020	0.102	0.078	0.074	0.025
Total Kjeldahl Nitrogen (mg/L)	8	< 0.150	0.339	0.075	0.108	0.093
Total Nitrogen	8	< 0.095	0.418	0.156	0.182	0.098
Dissolved Reactive Phosphorus (mg/L)	8	0.015	0.113	0.018	0.029	0.034
[J] Total Phosphorus (mg/L)	8	0.010	0.049	0.021	0.024	0.011
CBOD-5 (mg/L)	8	< 1.0	1.4	0.5	0.8	0.4
[J] Chlorides (mg/L)	8	2.0	2.5	2.3	2.3	0.1
Atrazine (µg/L)	6	< 0.05	< 0.05	0.02	0.02	0.00
Total Metals						
Aluminum (mg/L)	2	0.130	1.300	0.715	0.715	0.827
Iron (mg/L)	2	1.200	1.300	1.250	1.250	0.071
Manganese (mg/L)	2	0.500	0.773	0.636	0.636	0.193
Dissolved Metals						
Aluminum (mg/L)	2	< 0.015	0.190	0.099	0.099	0.129
Antimony (µg/L)	2	< 2.0	5.0	1.7	1.7	1.1
Arsenic (µg/L)	2	< 2.0	5.0	2.0	2.0	0.0
Cadmium (mg/L)	2	< 0.0	< 0.0	0.0	0.0	0.0
Chromium (mg/L)	2	< 0.004	0.010	0.004	0.004	0.002
Copper (mg/L)	2	< 0.005	0.010	0.004	0.004	0.002
Iron (mg/L)	2	0.173	0.200	0.186	0.186	0.019
Lead (µg/L)	2	< 2.0	5.0	2.0	2.0	1.0
Manganese (mg/L)	2	0.480	0.739	0.610	0.610	0.183
Mercury (µg/L)	2	< 0.3	0.5	0.2	0.2	0.1
Nickel (mg/L)	2	< 0.006	0.010	0.004	0.004	0.001
Selenium (µg/L)	2	< 1.6	5.0	1.7	1.7	1.2
Silver (mg/L)	2	< 0.0	< 0.0	0.0	0.0	0.0
Thallium (µg/L)	2	< 0.6	2.5	0.8	0.8	0.7
Zinc (mg/L)	2	< 0.006	0.010	0.004	0.004	0.001
Biological						
[J] Chlorophyll a (ug/L)	8	< 0.10	3.20	0.94	1.26	1.27
Fecal Coliform (col/100 mL)	8	130	590	290	338	167

G = value higher than median concentration of all verified ecoregional reference reach data collected in ecoregion; J = estimate; N = # of samples.