

2006 Monitoring Summary



Little Kinterbish Creek at Sumter County Road 9 (32.35395/-88.26552)

BACKGROUND

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

Additionally, Little Kinterbush 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 Little Kinterbush Creek as a "best attainable" condition reference watershed for comparison with other coastal plain streams.



Figure 1. Photo of Little Kinterbish Creek at LKNS-1, January 27, 2010.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Little Kinterbish Creek at LKNS-1 is a low-gradient *Swimming/Fish & Wildlife (S/F&W)* stream in Sumter County. Land use within the watershed is primarily forest (73%) with some shrub/scrub (Table 1). ADEM has issued two NPDES permits 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. Little Kinterbish Creek at LKNS-1 is a sand-bottomed, glide-pool stream typical of the Southern Hilly Gulf Coastal Plain sub-ecoregion (Figure 1). Overall habitat quality was rated as *sub-optimal* due to straight stream channel and unstable banks.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin	Lower Tombigbee	
Drainage Area (mi ²)	29	
Ecoregion ^a	65d	
% Landuse		
Open water		<1
Wetland	Woody	5
	Emergent herbaceous	<1
Forest	Deciduous	23
	Evergreen	27
	Mixed	23
Shrub/scrub		16
Grassland/herbaceous		<1
Pasture/hay		2
Cultivated crops		1
Development	Open space	3
	Low intensity	<1
	Moderate intensity	<1
Population/km ^{2b}	6	
# NPDES Permits ^c	TOTAL	2
Construction Stormwater		2

a. Southern Hilly Gulf Coastal Plain

b. 2000 US Census

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

Table 2. Physical characteristics of Little Kinterbish Creek at LKNS-1 on June 1, 2006.

Physical Characteristics		
Width (ft)	20	
Canopy cover	Mostly Shaded	
Depth (ft)	Run	1.5
	Pool	2.0
% of Reach	Run	60
	Pool	40
% Substrate	Gravel	1
	Sand	70
	Silt	5
	Organic Matter	9
	Mud/Muck	15

Table 3. Results of the habitat assessment of Little Kinterbish Creek at LKNS-1 on June 1, 2006. Macroinvertebrates were also sampled during this visit.

Habitat Assessment	(% Maximum Score)	Rating
Instream habitat quality	55	Sub-optimal (53-65)
Sediment deposition	60	Sub-optimal (53-65)
Sinuosity	43	Poor (<45)
Bank and vegetative stability	46	Marginal (35-59)
Riparian buffer	70	Sub-optimal (70-90)
Habitat assessment score	125	
% Maximum score	57	Sub-optimal (53-65)

BIOASSESSMENT RESULTS

Benthic macroinvertebrate communities were sampled using ADEM's Intensive Multi-habitat Bioassessment methodology (WMB-I). The WMB-I measures 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 with the final score comprised of the average of each metric score. The metric results indicated the macroinvertebrate community to be in *good* condition (Table 4).

Table 4. Results of the macroinvertebrate bioassessment of Little Kinterbish Creek at LKNS-1 on June 1, 2006.

Macroinvertebrate Assessment			
	Results	Scores	Rating
Taxa richness measures			
# EPT genera	17	68	Good (57-78)
Taxonomic composition measures			
% Non-insect taxa	11	71	Fair (61.9-92.7)
% Plecoptera	0	1	Very Poor (<1.86)
% Dominant taxa	16	85	Good (70.6-85.2)
Functional composition measures			
% Predators	32	100	Excellent (>72.1)
Tolerance measures			
Beck's community tolerance index	9	41	Good (31.9-65.9)
% Nutrient tolerant organisms	25	74	Fair (50.9-76.2)
WMB-I Assessment Score	--	63	Good (57-78)

WATER CHEMISTRY

Results of water chemistry analyses are summarized in Table 5. Stream pH exceeded *F&W* use classification criteria during the March sampling event. Results of other parameters were similar to data collected at least-impaired reference reaches located within the Southern Hilly Gulf Coastal Plain ecoregion.

SUMMARY

Bioassessment results indicate the macroinvertebrate community to be in *good* condition. However, the lack of bank and vegetative stability as well as poor sinuosity are areas of concern.

As part of the assessment process, ADEM will review the monitoring 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, 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. Metals results were compared to ADEM's chronic aquatic life use criteria adjusted for hardness.

Parameter	N	Min	Max	Med	Avg	SD	Q
Physical							
Temperature °C	9	15.0	25.0	22.0	21.3	3.0	
Turbidity (NTU)	9	8.8	33.2	12.2	15.0	7.8	
Total Dissolved Solids (mg/L)	8 <	1.0	79.0	38.0	42.9	24.2	
Total Suspended Solids (mg/L)	8	8.0	40.0	10.0	13.9	10.7	
Specific Conductance (µmhos)	9	29.0	35.3	31.3	31.4	2.3	
Hardness (mg/L)	3	8.7	36.0	28.0	24.2	14.0	
Alkalinity (mg/L)	8	5.9	32.0	7.5	10.8	8.7	
Stream Flow (cfs)	8	6.9	36.1	11.4	14.5	9.1	
Chemical							
Dissolved Oxygen (mg/L)	9	7.0	9.5	7.6	7.7	0.7	
pH (su)	9	6.5	9.0 ^c	6.7	7.0	0.8	
Ammonia Nitrogen (mg/L)	8 <	0.015	0.153	0.026	0.042	0.049	
Nitrate+Nitrite Nitrogen (mg/L)	8 <	0.003	0.108	0.052	0.055	0.034	
Total Kjeldahl Nitrogen (mg/L)	8 <	0.150	0.648	0.366	0.368	0.175	
Total Nitrogen	8 <	0.105	0.756	0.427	0.423	0.199	
Dissolved Reactive Phosphorus (mg/L)	8 <	0.004	0.008	0.002	0.004	0.002	
Total Phosphorus (mg/L)	8 <	0.004	0.100	0.050	0.043	0.017	
CBOD-5 (mg/L)	8 <	0.4	4.5	0.9	1.5	1.5	
COD (mg/L)	2 <	2.0 <	2.0	1.0	1.0	0.0	
TOC (mg/L)	2	3.9	6.3	5.1	5.1	1.7	
Chlorides (mg/L)	6	2.0	4.9	2.2	2.6	1.2	
Atrazine (µg/L)	1			<	0.05		
Total Metals							
Aluminum (mg/L)	3	0.151	0.360	0.280	0.264	0.106	
Iron (mg/L)	3	1.640	1.830	1.670	1.713	0.102	
Manganese (mg/L)	3	0.075	0.101	0.084	0.087	0.013	
Dissolved Metals							
Aluminum (mg/L)	3 <	0.050	0.210	0.140	0.125	0.093	
Antimony (µg/L)	3 <	7.5	<10.0	3.8	4.2	0.7	
Arsenic (µg/L)	3 <	5	< 10	3	3	1	
Cadmium (mg/L)	3 <	0.000	<0.015	0.000	0.003	0.004	
Chromium (mg/L)	3 <	0.005	<0.050	0.002	0.010	0.013	
Copper (mg/L)	3 <	0.005	<0.050	0.002	0.010	0.013	
Iron (mg/L)	3	0.307	0.353	0.320	0.327	0.024	
Lead (µg/L)	3 <	5	< 10	3	3	1	
Manganese (mg/L)	3	0.053	0.061	0.053	0.056	0.005	
Mercury (µg/L)	3 <	0.0	< 0.5	0.2	0.2	0.1	
Nickel (mg/L)	3 <	0.005	<0.050	0.002	0.010	0.013	
Selenium (µg/L)	3 <	7.5	<50.0	3.8	10.8	12.3	
Silver (mg/L)	3 <	0.001	<0.050	0.000	0.009	0.014	
Thallium (µg/L)	3 <	2.5	<10.0	4.5	3.6	2.0	
Zinc (mg/L)	3 <	0.005	<0.050	0.002	0.010	0.013	
Biological							
Chlorophyll a (ug/L)	8 <	0.10	8.01	1.07	2.48	2.66	
Fecal Coliform (col/100 mL)	6	120	1,200	270	433	402	E

E=estimate; N= # of samples; M=value >90% of collected samples in ecoregion 65d; C=value exceeds use classification criteria (specific conductance value lower than expected within 65d ecoregion)