

2011 Monitoring Summary



Kinterbish Creek at Sumter County Road 9 (32.34627/-88.26527)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected Kinterbish Creek watershed for biological and water quality monitoring as part of the 2011 Escatawpa, Mobile, and Tombigbee (EMT) River Basin Assessment. The objectives of the project were to assess the biological integrity of each monitoring site and to estimate overall water quality within these basins.



Figure 1. Kinterbish Creek at KNBS-1, May 18, 2011.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin		Lower Tombigbee River
Drainage Area (mi²)		28
Ecoregion^a		65d
% Landuse		
Open water		<1
Wetland	Woody	9
	Emergent herbaceous	<1
Forest	Deciduous	23
	Evergreen	28
	Mixed	14
Shrub/scrub		13
Grassland/herbaceous		7
Pasture/hay		3
Cultivated crops		1
Development	Open space	3
	Low intensity	<1
Population/km^{2b}		2
# NPDES Permits^c		TOTAL
	Municipal Individual	2

a. Southern Hilly Gulf Coastal Plain

b. 2000 US Census

c. #NPDES permits downloaded from ADEM's NPDES Management System database, June 6, 2013.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Kinterbish Creek is a *Swimming/Fish & Wildlife (S/F&W)* stream located in the Southern Hilly Gulf Coastal Plain (65d). Based on the 2006 National Land Cover Dataset, landuse within the watershed is predominantly forest (65%) with some shrub/scrub and grassland. As of June 6, 2013, two municipal individual permits have been issued within 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. Kinterbish Creek at KNBS-1 is a low-gradient, glide-pool stream with substrate composed primarily of sand (Figure 1). The reach was characterized by limited root bank habitat and a relatively straight stream channel.

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 *good* condition (Table 4).

Table 2. Physical characteristics of Kinterbish Creek at KNBS-1, September 14, 2011.

Physical Characteristics	
Canopy Cover	Mostly Shaded
Width (ft)	20
Depth (ft)	
	Run 1.0
	Pool 3.0
% of Reach	
	Run 20
	Pool 80
% Substrate	
	Sand 93
	Silt 1
	Organic Matter 6

Table 3. Results of the habitat assessment conducted on Kinterbish Creek at KNBS-1, September 14, 2011.

Habitat Assessment	% Maximum Score	Rating
Instream Habitat Quality	53	Sub-optimal (53-65)
Sediment Deposition	59	Sub-optimal (53-65)
Sinuosity	45	Marginal (45-64)
Bank and Vegetative Stability	40	Marginal (35-59)
Riparian Buffer	90	Optimal >89
Habitat Assessment Score	133	
% Maximum Score	60	Sub-optimal (53-65)

Table 4. Results of the macroinvertebrate bioassessment conducted in Kinterbish Creek at KNBS-1, September 14, 2011.

Macroinvertebrate Assessment		
	Results	Scores
Taxa richness and diversity measures		(0-100)
% EPC taxa	25	37
% Dominant Taxon	13	95
Taxonomic composition measures		
% EPT minus Baetidae and Hydropsychidae	0	0
Functional feeding group		
# Collector Taxa	28	100
Community tolerance		
% Nutrient Tolerant individuals	13	91
WMB-I Assessment Score	--	65
WMB-I Assessment Rating		Good (48-74)

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 5. In situ measurements and water samples were collected March, May, July, and September of 2011 to help identify any stressors to the biological communities.

Organics were collected at KNBS-1 on May 4th and September 7th; however, all parameters were below detection limits. Stream pH was below the *F&W* use criterion for two out of five sampling events.

SUMMARY

Bioassessment results indicated the macroinvertebrate community to be in *good* condition. Overall habitat quality was categorized as *sub-optimal* due to a marginal stream sinuosity and bank and vegetative stability. Monitoring should continue to ensure that biological and water quality conditions remain stable.

FOR MONITORING INFORMATION, CONTACT:
Alicia K. Phillips ADEM Environmental Indicators Section
1350 Coliseum Boulevard Montgomery, AL 36110
(334) 260-2797 akphillips@adem.state.al.us

Table 5. Summary of water quality data collected March, May, July, and 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	E
Physical							
Temperature (°C)	5	14.4	23.3	16.8	17.8	3.6	
Turbidity (NTU)	6	11.2	44.5	16.1	22.9	13.9	
↓ Total Dissolved Solids (mg/L)	4	74.0	88.0	75.0	78.0	6.7	
↓ Total Suspended Solids (mg/L)	4	2.0	17.0	10.0	9.8	7.0	
Specific Conductance (µmhos)	5	45.8	70.3	57.3	57.3	11.4	
Hardness (mg/L)	4	12.9	18.1	13.8	14.6	2.4	
Alkalinity (mg/L)	4	7.3	17.1	10.7	11.4	4.1	
Stream Flow (cfs)	5	2.7	26.3	10.8	12.3	8.7	
Chemical							
Dissolved Oxygen (mg/L)	5	7.2	9.0	8.8	8.3	0.8	
pH (su)	5	5.6 ^C	6.9	6.0	6.2	0.6	2
Ammonia Nitrogen (mg/L)	4	< 0.005	0.035	0.002	0.011	0.016	
↓ Nitrate+Nitrite Nitrogen (mg/L)	4	0.016	0.113	0.041	0.053	0.042	
Total Kjeldahl Nitrogen (mg/L)	4	0.434	0.710	0.609	0.590	0.122	
↓ Total Nitrogen (mg/L)	4	0.450	0.823	0.650	0.643	0.159	
↓ Dissolved Reactive Phosphorus (mg/L)	4	0.005	0.009	0.008	0.007	0.002	
Total Phosphorus (mg/L)	4	0.023	0.055	0.031	0.035	0.014	
↓ CBOD-5 (mg/L)	4	< 2.0	< 2.0	1.0	1.0	0.0	
Chlorides (mg/L)	4	1.7	3.2	2.4	2.4	0.8	
↓ Atrazine (µg/L)	2	< 0.02	< 0.02	0.01	0.01	0.00	
Total Metals							
↓ Aluminum (mg/L)	4	0.084	1.560	1.144	0.983	0.716	
Iron (mg/L)	4	1.440	2.540	2.125	2.058	0.456	
Manganese (mg/L)	4	0.057	0.140	0.084	0.091	0.035	
Dissolved Metals							
↓ Aluminum (mg/L)	4	< 0.043	0.073	0.054	0.051	0.021	
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	0.204	1.160	0.272	0.477	0.457	
Lead (µg/L)	4	< 0.9	< 0.9	0.5	0.5	0.0	
Manganese (mg/L)	4	0.053	0.122	0.070	0.079	0.030	
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	2.3	0.7	1.1	0.8	
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	
Biological							
Chlorophyll a (ug/L)	4	1.53	2.14	1.96	1.90	0.30	
↓ E. coli (col/100mL)	4	85	921	334	419	407	

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