Alabama Department of Environmental Management

Basin Assessment Site

Rivers and Streams Monitoring Program

2014 Monitoring Summary

Fair

Eightmile Creek at Geneva County Road 10 (31.04886/-86.14538)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the Eightmile Creek watershed for biological and water quality monitoring as part of the 2014 Survey of Southeastern Alabama River Basins. The objectives of these surveys were to assess the biological integrity of each monitoring site and to estimate overall water quality within Southeast Alabama. Eightmile Creek at ETMG-1 is being sampled as a possible reference reach station.

A previous survey of Eightmile Creek at ETMG-1 conducted by the Geological Survey of Alabama indicated the fish community to be in *good*condition. The reach is among the least-disturbed watersheds in the Dougherty Plains (65g) sub-ecoregion, based on landuse, road density, and population density. The 2014 data will be used to evaluate Dunham Creek as a best attainable condition reference watershed for comparison with other stations in the same ecoregion.

Figure 1. Eightmile Creek at ETMG-1, July 2, 2014.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Eightmile Creek is a small *Fish & Wildlife (F&W)* stream located approximately 11 mile east of Florala in the Choctawhatchee River basin. Based on the 2011 National Land Cover Dataset, land use within the watershed is primarily forest (47%) with some shrub/scrub, pasture/hay and cultivated crops. As of April 1, 2016, there was only one NPDES outfall active in the area.

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. Eightmile Creek at ETMG-1 is characterized by a sandy bottom, typical of creeks in the 65g ecoregion (Figure 1). Overall habitat quality was categorized as *marginal*.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin		Choctawhatchee River.
Drainage Area (mi^2)		64
Ecoregion[a]		65G
% Landuse[b]		
Open water		<1%
Wetland	Woody	9%
	Emergent herbaceous	<1%
Forest	Deciduous	2%
	Evergreen	42%
	Mixed	3%
Shrub/scrub		19%
Grassland/herbaceous		3%
Pasture/hay		10%
Cultivated crops		6%
Development	Open space	3%
	Low intensity	<1%
	Moderate intensity	<1%
Population/km^2[c]		1
# NPDES Permits[d]	**TOTAL**	1
Small Mining		1

a. Doughtery Plain

b. 2011 National Land Cover Dataset

c. 2010 US Census

d. #NPDES outfalls downloaded from ADEM's NPDES Management System database, April 1, 2016.

Table 2. Physical characteristics of Eightmile Creek at ETMG-1, July 2, 2014.

Physical Characteristics		
Width (ft)		37
Canopy cover		Shaded
Depth (ft)		
	Run	1.5
	Pool	4.5
% of Reach		
	Run	80
	Pool	20
% Substrate		
	Sand	82
	Silt	5
	Organic Matter	13

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 4a).

Table 3. Results of the habitat assessment conducted on Eightmile Creek at ETMG-1, July 2, 2014..

Habitat Assessment	% Maximum Score	Rating
Instream Habitat Quality	37	Marginal (31-55)
Sediment Deposition	53	Marginal (31-55)
Sinuosity	48	Marginal (31-55)
Bank Vegetative Stability	49	Marginal (31-58)
Riparian Buffer	83	Sub-Optimal (60-84)
Habitat Assessment Score	**95**	
% Maximum Score	**56**	**Marginal (31-<57)**

Table 4. Results of the macroinvertebrate bioassessment conducted in Eightmile Creek at ETMG-1, July 2, 2014.

Macroinvertebrate Assessment		
	Results	**Scores**
Taxa richness and diversity measures		**(0-100)**
% EPC taxa	24	32
% Dominant Taxon	47	21
Taxonomic composition measures		
% EPT minus Baetidae and Hydropsychidae	13	24
Functional feeding group		
# Collector Taxa	22	66
Community tolerance		
% Nutrient Tolerant individuals	51	23
WMB-I Assessment Score	**---**	**33**
WMB-I Assessment Rating		**Fair (31-45)**

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 5. In situ measurements and water samples were collected monthly or semi-monthly (metals), March through October of 2014 to help identify any stressors to the biological communities. Organics were sampled and all were below detection limits. Specific conductance, hardness, alkalinity, dissolved aluminum, nitrate+nitrite nitrogen and chlorophyll a were higher than expected based on reference reach data collected in the Doughtery plain ecoregion.

SUMMARY

As part of the assessment process, ADEM will review the monitoring information presented in this report along with all other available data. The habitat assessment indicated ETMG-1 to be in *marginal* condition. Macroinvertebrate sampling indicated the macroinvertebrate community to be in *fair* condition. Specific conductance, hardness, alkalinity, aluminum and chlorophyll a were higher than expected based on reference reach data collected in the Doughtery Plain sub-ecoregion.

FOR MORE INFORMATION, CONTACT:
Ron Sparks II, ADEM Aquatic Assessment Unit
1350 Coliseum Boulevard Montgomery, AL 36110
(334) 394-4303 Rsparks@adem.alabama.gov

Table 5. Summary of water quality data collected March through October, 2014. 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	Q
	Physical							
	Temperature (°C)	10	14.4	24.5	21.1	20.4	3.9	
	Turbidity (NTU)	10	3.4	15.3	6.8	7.5	3.9	
	Total Dissolved Solids (mg/L)	8	80.0	130.0	87.5	94.1	16.8	
	Total Suspended Solids (mg/L)	8	< 1.0	12.0	4.0	4.8	3.6	
	Specific Conductance (µmhos/cm)	10	29.8	138.3	86.0 G	85.5	41.4	
	Hardness (mg/L)	4	14.3	61.7	38.2 G	38.1	22.0	
	Alkalinity (mg/L)	8	10.2	64.6	43.9 M	40.1	21.8	
	Monthly Stream Flow (cfs)	5	38.4	76.4	50.9	52.0	15.0	
	Measured Stream Flow (cfs)	5	38.4	76.4	50.9	52.0	15.0	
	Chemical							
	Dissolved Oxygen (mg/L)	9	7.3	10.8	7.8	8.2	1.1	
	pH (SU)	10	6.4	7.7	7.2	7.2	0.4	
	Ammonia Nitrogen (mg/L)	8	< 0.006	< 0.010	0.003	0.004	0.001	
	Nitrate+Nitrite Nitrogen (mg/L)	8	0.095	0.447	0.324 M	0.294	0.148	
J	Total Kjeldahl Nitrogen (mg/L)	8	0.063	0.863	0.426	0.437	0.266	
J	Total Nitrogen (mg/L)	8	0.485	0.958	0.738	0.731	0.142	
J	Dis Reactive Phosphorus (mg/L)	8	0.003	0.015	0.005	0.006	0.004	
J	Total Phosphorus (mg/L)	8	0.012	0.031	0.018	0.019	0.006	
	CBOD-5 (mg/L)	8	< 2.0	< 2.0	1.0	1.0	0.0	
	COD (mg/L)	8	9.4	33.0	16.4	19.5	7.9	
	TOC (mg/L)	8	2.5	9.8	6.3	6.4	3.2	
	Chlorides (mg/L)	8	2.1	3.5	3.1	3.0	0.5	
	Atrazine (µg/L)	1	<			0.10		
	Total Metals							
J	Aluminum (mg/L)	4	< 0.050	0.443	0.188	0.211	0.183	
J	Iron (mg/L)	4	0.198	0.553	0.402	0.389	0.154	
J	Manganese (mg/L)	4	0.026	0.038	0.030	0.031	0.005	
	Dissolved Metals							
J	Aluminum (mg/L)	4	< 0.050	0.249	0.110 M	0.124	0.102	
	Antimony (µg/L)	4	< 0.176	< 0.176	0.088	0.088	0.000	
J	Arsenic (µg/L)	4	< 0.386	< 0.450	0.408	0.413	0.027	4
	Cadmium (µg/L)	4	< 0.246	< 0.246	0.123	0.123	0.000	
J	Chromium (µg/L)	4	0.763	1.486	0.880	1.002	0.330	
J	Copper (µg/L)	4	< 0.276	0.516	0.224	0.276	0.180	
J	Iron (mg/L)	4	0.113	0.360	0.242	0.239	0.106	
J	Lead (µg/L)	4	< 0.230	0.248	0.115	0.148	0.066	
J	Manganese (mg/L)	4	0.017	0.027	0.020	0.021	0.004	
J	Nickel (µg/L)	4	< 0.167	0.368	0.195	0.210	0.119	
J	Selenium (µg/L)	4	< 0.154	< 0.395	0.198	0.187	0.022	
	Silver (µg/L)	4	< 0.252	< 0.252	0.126	0.126	0.000	
	Thallium (µg/L)	4	< 0.233	< 0.233	0.116	0.116	0.000	
J	Zinc (µg/L)	4	2.800	4.247	3.472	3.498	0.644	
	Biological							
	Chlorophyll a (mg/m³)	8	0.76	17.80	2.80 M	5.46	5.84	
J	E. coli (MPN/DL)	8	93.2	686.7	122.8	187.7	202.3	

G=value higher than median concentration of all verified ecoregional reference reach data collected in the ecoregion [65G], H=*F&W* human health criterion exceeded; J=estimate; M=value > 90% of all data collected within ecoregion 65G; N= # samples; Q=# of samples that it is uncertain if criteria was exceeded.