Alabama Department of Environmental Management

Basin Assessment Site

Rivers and Streams Monitoring Program

2006 Monitoring Summary

Pine Barren Creek at Washington County Road 34 (31.62303/-88.20715)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the Pine Barren 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, Pine Barren 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 Pine Barren Creek as a "best attainable" condition reference watershed for comparison with other coastal plain streams.

Macroinvertebrate and habitat assessments could not be conducted in Pine Barren Creek at PBCW-1 due to non-wadeable and non-flowing conditions in May and June of 2006, when macroinvertebrate bioassessments are generally conducted.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Pine Barren Creek at PBCW-1 is a low-gradient *Fish & Wildlife (F&W)* stream located in Washington County near the town of Bigbie, Alabama. Land use within the watershed is primarily forest (78%) with shrubs and wetlands. As of June 9, 2008, the ADEM has issued one NPDES permit in this watershed.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin		L. Tombigbee R.
Drainage Area (mi^2)		23
Ecoregion[a]		65f
% Landuse		
Wetland	Woody	8
	Emergent herbaceous	<1
Forest	Deciduous	4
	Evergreen	41
	Mixed	33
Shrub/scrub		9
Grassland/herbaceous		<1
Pasture/hay		2
Cultivated crops		<1
Development	Open space	2
	Low intensity	<1
Population/km^2 [b]		6
# NPDES Permits[c]	**TOTAL**	1
Construction Stormwater		1

a. Southern Pine Plains & Hills
b. 2000 US Census
c. #NPDES permits downloaded from ADEM's NPDES Management System database, 9 Jun 2008

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 2. When possible, in situ measurements and water samples are collected monthly, semi-monthly (metals), or quarterly (pesticides, herbicides (atrazine), and semi-volatile organics) during March through October to help identify any stressors to the biological communities. Stream pH was low, but typical of blackwater streams in this region of Alabama. Samples could not be collected July-October due to drought conditions. Maximum flow, conductivity, and turbidity were measured in March after a rainstorm event. Maximum concentrations of total and dissolved solids, alkalinity, and nutrients were also measured in March.

Figure 1. Pine Barren Creek at PBCW-1, January, 2010.

SUMMARY

As part of the assessment process, ADEM will review the monitoring information presented in this report, along with all other available data.

Non-wadeable and non-flowing conditions in May-June prevented the completion of macroinvertebrate and habitat assessments. Drought conditions prevented collection of water samples July through October.

Table 2. 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

Parameter	N		Min	Max	Med	Avg	SD	Q
Physical								
Temperature (°C)	4		20.0	27.0	23.0	23.2	2.9	
Turbidity (NTU)	4		2.3	11.2	2.6	4.7	4.4	
Total Dissolved Solids (mg/L)	4		36.0	61.0	43.0	45.8	10.8	
Total Suspended Solids (mg/L)	4		1.0	11.0	6.5	6.2	4.3	
Specific Conductance (µmhos)	4		18.3	23.3	21.1	21.0	2.0	
Alkalinity (mg/L)	4	<	1.0	7.0	0.5	2.1	3.2	
Stream Flow (cfs)	3		1.3	17.4	3.3	7.3	8.8	
Chemical								
Dissolved Oxygen (mg/L)	4		5.3	7.3	6.7	6.5	0.9	
pH (su)	4		4.9	5.3	5.0	5.1	0.2	
Ammonia Nitrogen (mg/L)	4	<	0.010	0.015	0.008	0.007	0.001	
Nitrate+Nitrite Nitrogen (mg/L)	4	<	0.003	0.052	0.002	0.014	0.025	
Total Kjeldahl Nitrogen (mg/L)	4		0.260	0.730	0.374	0.434	0.209	
Total Nitrogen (mg/L)	4	<	0.262	0.732	0.401	0.449	0.211	
Dissolved Reactive Phosphorus (mg/L)	4	<	0.004	0.013	0.006	0.007	0.006	
Total Phosphorus (mg/L)	4	<	0.004	0.050	0.031	0.028	0.022	
CBOD-5 (mg/L)	4	<	1.0	2.0	1.8	1.5	0.7	
Chlorides (mg/L)	4	<	1.0	6.0	4.4	4.0	2.2	
Biological								
Chlorophyll a (ug/L)	4	<	1.00	2.67	2.14	1.86	0.94	
Fecal Coliform (col/100 mL)	3		5	10	8	8	3	J

Q=qualifier; J=estimate; N= # of samples; M=value >90% of collected samples in eco-region 65f; C=value exceeds established criteria for *F&W* water use classification.

FOR MORE INFORMATION, CONTACT:
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