

2005 Monitoring Summary

Panther Creek above confluence with Line Creek at Montgomery CR 2 (32.30188, -85.95477)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the Panther Creek watershed for biological and water quality monitoring as part of the 2005 Assessment of the Alabama, Coosa, and Tallapoosa (ACT) River Basins. Habitat and macroinvertebrate assessments are generally conducted to assess the biological integrity of each Basin Assessment monitoring site and to estimate overall water quality within each basin group. However, Panther Creek at PANM-1 was not flowing during the site visit. Habitat and macroinvertebrate assessments could not be conducted.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table-1. Panther Creek at PANM-1 is a *Fish & Wildlife (F&W)* stream located in the Flatwoods/Blackland Prairie ecoregion of Montgomery County (Fig. 1). Landuse within the watershed is primarily pasture and hay fields, forest (27%), wetlands (11%) and crop land (Fig.1).

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 2. Samples were collected monthly, semi-monthly (metals), or quarterly (pesticides, herbicides, and semi-volatile organics) during March through October of 2005. The bacteria sample during the July site visit resulted in a fecal concentration >2000 colonies/100ml. This result was likely due to a heavy rain event just days before. Median of specific conductance, total phosphorus, hardness, chloride, alkalinity, atrazine, and total manganese were higher than the 90th percentile of reference reach data collected in ecoregions 65a & 65b.

CONCLUSIONS

Panther Creek at PANM-1 was selected for biological and water quality monitoring as part of the 2005 Assessment of the ACT River Basins. However, the reach was not flowing enough to conduct a habitat or macroinvertebrate assessment. These assessments will need to be completed to determine the effects of elevated conductivity, total dissolved solids, total phosphorus, hardness, chlorides, alkalinity, atrazine, and total manganese on the biological integrity of the reach.

Table 1. Summary of watershed characteristics.

Watershed Characteristics	
Drainage Area (mi ²)	27
Ecoregion ^a	65b
% Landuse	
Open water	2
Wetland	Woody 10 Emergent herbaceous 1
Forest	Deciduous 12 Evergreen 7 Mixed 8
Shrub/scrub	10
Grassland/herbaceous	<1
Pasture/hay	39
Cultivated crops	8
Development	Open space 2 Low intensity <1 Moderate intensity <1
Population/km ^{2b}	31
# NPDES Permits ^c	TOTAL 4
Construction Stormwater 4	

a.Flatwood/Blackland Prairie Margins

b.2000 U.S. Census Data

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

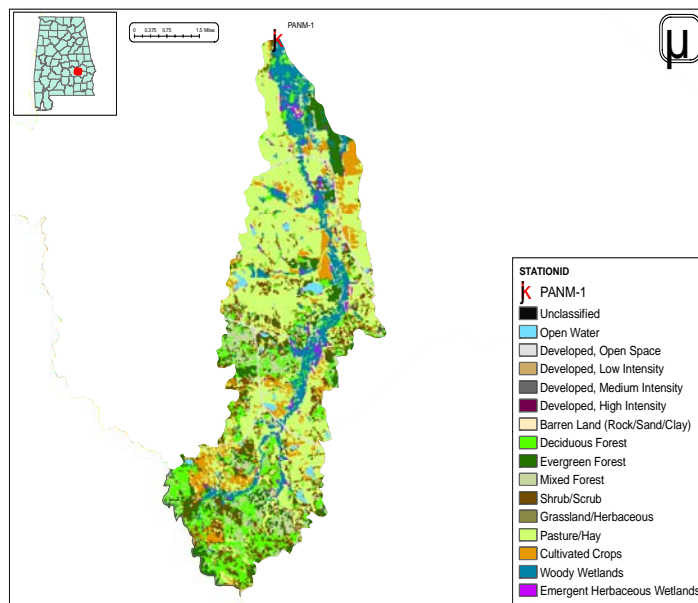


Figure 1. Sampling location and landuse within the Panther Creek watershed at PANM-1.

Table 2. Summary of water quality data collected March-October, 2005. 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 values. Metals results were compared to ADEM's chronic aquatic life use criteria adjusted for hardness.

Parameter	N	Min	Max	Median	Avg	SD
Physical						
Temperature (°C)	7	9.4	25.0	21.0	19.7	5.9
Turbidity (NTU)	7	11.0	58.6	26.4	28.4	17.0
Total dissolved solids (mg/L)	7	41.0	203.0	183.0 ^M	166.1	56.5
Total suspended solids (mg/L)	7	7.0	53.0	21.0	22.1	15.1
Specific conductance (µmhos)	7	157.1	382.9	297.7 ^M	272.2	92.8
Hardness (mg/L)	4	86.3	180.0	151.5 ^M	142.3	42.2
Alkalinity (mg/L)	7	65.9	171.1	139.4 ^M	119.5	38.3
Stream Flow (cfs)	1	23.9	23.9	23.9	23.9	---
Chemical						
Dissolved oxygen (mg/L)	7	1.8c	8.5	5.0	5.0	2.3
pH (su)	6	6.9	8.1	7.3	7.4	0.4
Ammonia Nitrogen (mg/L)	7	< 0.015	0.064	0.039	0.036	0.022
Nitrate+Nitrite Nitrogen (mg/L)	7	< 0.003	0.089	0.067	0.052	0.035
Total Kjeldahl Nitrogen (mg/L)	7	0.386	1.033	0.760	0.779	0.242
Total nitrogen (mg/L)	7	0.390	1.102	0.827	0.831	0.274
Dissolved reactive phosphorus (mg/L)	7	< 0.004	0.200	0.029	0.058	0.070
Total phosphorus (mg/L)	7	0.082	0.211	0.140 ^M	0.142	0.042
CBOD-5 (mg/L)	7	1.3	5.1	2.4	3.2	1.5
^J Chlorides (mg/L)	7	6.3	13.5	9.8 ^M	9.7	2.5
Atrazine (µg/L)	2	< 0.05	0.13	0.08 ^M	0.08	0.07
Total Metals						
Aluminum (mg/L)	4	0.113	0.689	0.320	0.361	0.300
Iron (mg/L)	4	0.833	1.690	1.505	1.383	0.400
Manganese (mg/L)	4	< 0.005	0.233	0.129 ^M	0.123	0.100
Dissolved Metals						
Aluminum (mg/L)	4	< 0.015	0.190	0.008	0.053	0.100
Antimony (µg/L)	4	< 2	< 2	1	1	0
Arsenic (µg/L)	3	< 10	< 10	5	5	0
Cadmium (mg/L)	4	< 0.005	< 0.005	0.003	0.003	0.000
Chromium (mg/L)	4	< 0.004	< 0.005	0.002	0.002	0.000
Copper (mg/L)	4	< 0.004	< 0.005	0.003	0.002	0.000
Iron (mg/L)	4	0.074	0.381	0.221	0.224	0.100
Lead (µg/L)	4	< 2	< 2	1	1	0
Manganese (mg/L)	4	< 0.005	0.206	0.0838	0.094	0.100
Mercury (µg/L)	4	< 0.300	< 0.300	0.150	0.188	0.100
Nickel (mg/L)	4	< 0.006	< 0.006	0.003	0.003	0.000
Selenium (µg/L)	4	< 10	< 10	5	5	0
Silver (mg/L)	4	< 0.003	< 0.003	0.002	0.002	0.000
Thallium (µg/L)	4	< 1	< 1	0.5	0.5	0.0
Zinc (mg/L)	4	< 0.006	< 0.006	0.003	0.003	0.000
Biological						
^J Chlorophyll a (µg/L)	7	1.60	18.69	4.27	6.18	5.80
^J Fecal Coliform (col/100 mL)	7	44	> 2600 ^C	200	529	918

^J=estimate; N=# samples; Min=minimum; Max=maximum; M=value > 90% of all data within ecoregion 65b; C=Value exceeds criteria for *swimming & fish and wildlife* use classifications

FOR MORE INFORMATION, CONTACT:
 Scott Hicks, ADEM Aquatic Assessment Unit
 1350 Coliseum Boulevard Montgomery, AL 36110
 (334) 260-2786 Shicks@adem.state.al.us