

2006 Monitoring Summary

Polecat Creek at Baldwin County Road 9 (30.49091/-87.79673)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the Polecat Creek watershed for biological and water quality monitoring as part of the 2001 Basin-wide Screening Assessment of the Escatawpa, Mobile, and Tombigbee (EMT) River Basins. The screening assessments were conducted at stream reaches where land use estimates and non-point source information from the local Soil and Water Conservation Districts indicated a moderate or high potential for impairment from nonpoint sources in non-urban areas. Results of the 2001 screening-level evaluation identified Polecat Creek at PLCB-99 for further monitoring during the 2006 Basin Assessment of the EMT River Basins to more fully assess biological conditions at the site, as well as the extent and cause of any impairment.



Figure 1. Polecat Creek at PLCB-99, January 20, 2010.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Powell Creek at PWLM-32 is a *Fish & Wildlife (F&W)* stream located within the Southern Pine Plains and Hills ecoregion of Baldwin County. Landuse within the watershed consists primarily of forest (24%) and cultivated crops. The Department has issued forty NPDES permits in this watershed.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		Mobile Bay Area
Basin		
Drainage Area (mi ²)		30
Ecoregion ^a		65f
% Landuse		
Open water		<1
Wetland	Woody	2
	Emergent herbaceous	1
Forest	Deciduous	2
	Evergreen	16
	Mixed	6
Shrub/scrub		6
Grassland/herbaceous		<1
Pasture/hay		15
Cultivated crops		43
Development	Open space	6
	Low intensity	2
	Moderate intensity	<1
	High intensity	<1
Population/km ^{2b}		58
# NPDES Permits ^c	TOTAL	40
	Construction Stormwater	34
	Mining	6

a. Southern Pine Plains & Hills

b. 2000 US Census

c. #NPDES permits downloaded from ADEM's NPDES Management System data-

WATER CHEMISTRY

Results of water chemistry analyses are summarized in Table 2. Median concentrations of nutrients (total nitrogen and nitrate+nitrite nitrogen), metals (total aluminum and total and dissolved manganese), and hardness were higher than expected based on the 90th percentile of reference reach data collected in Southern Pine Plains and Hills ecoregion. Two pH values also exceeded use classification criteria.

SUMMARY

As part of the assessment process, ADEM will review the information in this reports along with all other available data. Information gathered during the 2006 sampling season suggest elevated nutrient and metal concentrations to be potential causes for the deterioration of biological conditions.

FOR MORE INFORMATION, CONTACT:

James Worley, ADEM Aquatic Assessment Unit
1350 Coliseum Boulevard Montgomery, AL 36110
(334) 394-4343 jworley@adem.state.al.us

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. 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	17.0	24.6	21.0	21.2	2.5	
Turbidity (NTU)	8	1.9	18.3	3.2	6.0	6.1	
Total Dissolved Solids (mg/L)	8	30.0	87.0	46.0	55.4	21.4	
Total Suspended Solids (mg/L)	8	< 1.0	14.0	2.5	5.2	4.8	
Specific Conductance (µmhos)	9	54.1	70.9	57.5	60.1	6.3	
Hardness (mg/L)	3	38.0	41.0	38.0 M	39.0	1.7	
Alkalinity (mg/L)	8	< 1.0	17.0	8.4	8.3	4.6	
Stream Flow (cfs)	2	29.3	35.5	32.4	32.4	4.4	
Chemical							
Dissolved Oxygen (mg/L)	9	6.1	8.0	7.5	7.2	0.7	
pH (su)	9	5.5 ^c	7.0	6.1	6.2	0.4	
Ammonia Nitrogen (mg/L)	8	< 0.010	0.060	0.008	0.016	0.020	
Nitrate+Nitrite Nitrogen (mg/L)	7	0.509	1.276	1.072 M	0.960	0.295	
Total Kjeldahl Nitrogen (mg/L)	8	< 0.150	0.700	0.242	0.300	0.259	
Total Nitrogen	7	< 0.075	1.451	1.351 M	1.292	0.145	
Dissolved Reactive Phosphorus (mg/L)	8	< 0.004	0.011	0.005	0.005	0.003	
Total Phosphorus (mg/L)	8	< 0.004	0.060	0.030	0.031	0.021	
CBOD-5 (mg/L)	8	< 1.0	3.0	1.2	1.4	0.8	
Chlorides (mg/L)	8	1.9	11.8	8.8	7.3	4.5	
Atrazine (µg/L)	2	< 0.05	0.05	0.02	0.02	0.00	
Total Metals							
Aluminum (mg/L)	3	0.120	0.660	0.620 M	0.467	0.301	
Iron (mg/L)	3	0.445	1.720	1.580	1.248	0.699	
Manganese (mg/L)	3	0.031	0.223	0.168 M	0.141	0.099	
Dissolved Metals							
Aluminum (mg/L)	3	0.130	0.340	0.150	0.207	0.116	
Antimony (µg/L)	3	< 7.5	7.5	3.8	3.8	0.0	
Arsenic (µg/L)	3	< 5	5	3	3	0	
Cadmium (mg/L)	3	< 0	0	0	0	0	
Chromium (mg/L)	3	< 0.005	0.005	0.002	0.002	0.000	
Copper (mg/L)	3	< 0.005	0.005	0.002	0.002	0.000	
Iron (mg/L)	3	0.268	0.370	0.285	0.308	0.055	
Lead (µg/L)	3	< 5	5	3	3	0	
Manganese (mg/L)	3	0.023	0.116	0.084 M	0.074	0.047	
Mercury (µg/L)	3	< 0.5	0.5	0.2	0.2	0.0	
Nickel (mg/L)	3	< 0.005	0.009	0.002	0.005	0.004	
Selenium (µg/L)	3	< 7.5	7.5	3.8	3.8	0.0	
Silver (mg/L)	3	< 0.0	0.0	0.0	0.0	0.0	
Thallium (µg/L)	3	< 2.5	9.0	4.5	3.4	1.9	
Zinc (mg/L)	3	< 0.005	0.050	0.006	0.011	0.012	
Biological							
Chlorophyll a (µg/L)	8	< 0.10	2.40	1.04	1.10	0.81	
Fecal Coliform (col/100 mL)	5	25	600	54	174	244 J	

J=estimate; N= # of samples; M=value >90% of collected samples in ecoregion 65f; C=value exceeds use classification criteria