

2008 Monitoring Summary



Parkerson Mill Creek at Lee County Road 010 (32.53744/-85.50601)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) monitored biological and water quality conditions in Parkerson Mill Creek at the request of a local citizen monitoring group. The sampling was conducted to monitor any impacts associated with increased discharge from an upstream waste water treatment plant.

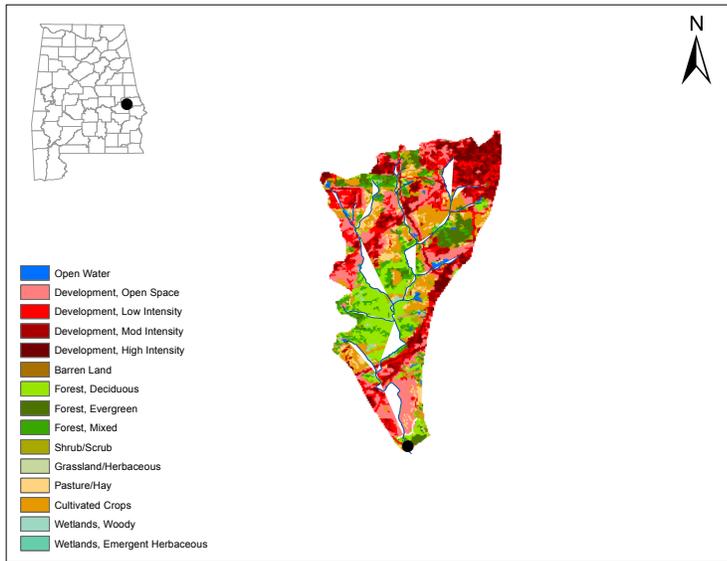


Figure 1. Sampling location and landuse within the Parkerson Mill Creek watershed at PKML-1.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. It is a small *Fish & Wildlife (F&W)* stream reach located within the Fall Line Hills ecoregion in Lee County. Parkerson Mill Creek watershed drains the Auburn area. Based on the 2000 National Land Cover Dataset, landuse within the watershed is composed primarily of developed areas (49%) with some forest (27%) and cultivated crops (Figure 1). As of February 23, 2011, ADEM's NPDES Management System database shows 156 permitted discharges within the 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. Parkerson Mill Creek at PKML-1 is a high-gradient stream. Instream substrates were dominated by bolder, bedrock, and cobble. Habitat quality and availability within the reach were rated *optimal* for supporting macroinvertebrate communities.

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 characterized by pollution-tolerant taxa groups, indicating *poor* community condition (Table 4).

Table 1. Summary of watershed characteristics.

Watershed Characteristics		Tallapoosa River
Basin		Tallapoosa River
Drainage Area (mi²)		7
Ecoregion^a		65i
% Landuse		
Open water		1
Wetland	Woody	1
	Emergent herbaceous	<1
Forest	Deciduous	14
	Evergreen	6
	Mixed	7
Shrub/scrub		5
Grassland/herbaceous		<1
Pasture/hay		6
Cultivated crops		11
Development	Open space	17
	Low intensity	13
	Moderate intensity	13
	High intensity	6
Population/km^{2b}		557
# NPDES Permits^c	TOTAL	156
	401 Water Quality Certification	3
	Construction Stormwater	144
	Industrial General	3
	Municipal Individual	4
	Underground Injection Control	2

a. Fall Line Hills

b. 2000 US Census

c. #NPDES permits downloaded from ADEM's NPDES Management System database, February 23, 2011.

Table 2. Physical characteristics of Parkerson Mill Creek at PKML-1, June 19, 2008.

Physical Characteristics	
Width (ft)	10
Canopy Cover	Shaded
Depth (ft)	
	Riffle 0.8
	Run 1.0
	Pool 1.5
% of Reach	
	Riffle 30
	Run 40
	Pool 30
% Substrate	
	Bedrock 20
	Boulder 40
	Cobble 20
	Gravel 10
	Sand 5
	Silt 3
	Organic Matter 2

Table 3. Results of the habitat assessment conducted on Parkerson Mill Creek at PKML-1, June 19, 2008.

Habitat Assessment	%Maximum Score	Rating
Instream Habitat Quality	80	Optimal >65
Sediment Deposition	74	Optimal >65
Sinuosity	90	Optimal >84
Bank and Vegetative Stability	76	Optimal >74
Riparian Buffer	85	Sub-optimal (70-89)
Habitat Assessment Score	189	
% Maximum Score	79	Optimal >65

Table 4. Results of the macroinvertebrate bioassessment conducted in Parkerson Mill Creek at PKML-1, June 19, 2008.

Macroinvertebrate Assessment			
	Result	Scores	Rating
Taxa richness measures		(0-100)	
# Ephemeroptera (mayfly)	6	50	Fair (47-70)
# Plecoptera (stonefly) genera	0	0	Very Poor (<16)
# Trichoptera (caddisfly) genera	7	58	Fair (45-66)
Taxonomic composition			
% Non-insect taxa	8	67	Fair (49.5-74.1)
% Non-insect organisms	2	93	Fair (62.8-93.9)
% Plecoptera	0	0	Very Poor
Tolerance measures			
Beck's community tolerance	5	18	Very Poor
WMB-I Assessment Score	--	41	Poor (24-48)

Table 5. Summary of water quality data collected June 19, 2008. Average (Avg) values were calculated by multiplying the MDL by 0.5 when results were less than this value.

Parameter	N	Avg
Physical		
Temperature (°C)	1	21.6
Turbidity (NTU)	1	3.1
Total Dissolved Solids (mg/L)	1	54.0
Total Suspended Solids (mg/L)	1	2.0
Specific Conductance (µmhos)	1	191.5 ^G
Alkalinity (mg/L)	1	70.1
Stream Flow (cfs)	1	0.7
Chemical		
Dissolved Oxygen (mg/L)	1	8.4
pH (su)	1	7.8
Ammonia Nitrogen (mg/L)	1	< 0.015
Nitrate+Nitrite Nitrogen (mg/L)	1	0.259
Total Kjeldahl Nitrogen (mg/L)	1	0.394
Total Nitrogen (mg/L)	1	0.653
Dissolved Reactive Phosphorus (mg/L)	1	0.010
Total Phosphorus (mg/L)	1	0.028
CBOD-5 (mg/L)	1	< 1.0
Chlorides (mg/L)	1	6.6

N=# samples; G=value higher than median concentration of all verified ecoregional reference reach data collected in the ecoregion 65i.

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 5. One set of [in situ measurements](#) and water samples were collected on June 19, 2008 for a Clean Water Partnership request to help identify any stressors to the biological communities. Specific conductance was higher than expected for ecoregion 65i. Stream flow was low during the sampling event.

SUMMARY

Overall habitat quality was categorized as *optimal*. With the exception of specific conductance, physical and chemical parameters were typical of streams in the Fall Line Hills ecoregion; however, bioassessment results indicated the macroinvertebrate community to be in *poor* condition. Low stream flow (0.7 cfs) on June 19th may have been a contributing factor to the *poor* community condition. Almost 50% of this watershed has been developed. Non-point source runoff from impervious surfaces could also be contributing to poor community condition. Further monitoring should be conducted to identify the cause and source of the degraded biological conditions.

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