

2008 Monitoring Summary



Chewacla Creek at abandoned bridge 0.2 miles downstream of Moores Mill Creek in Lee County (32.54797/-85.48046)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) monitored biological and water quality conditions in Chewacla 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.

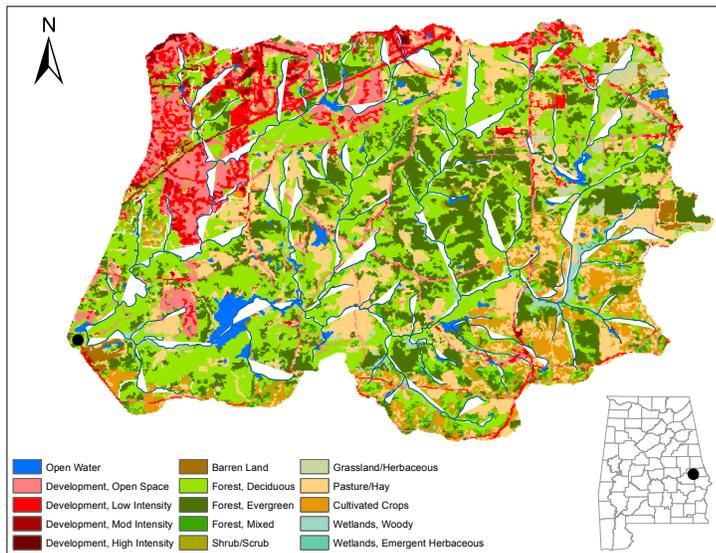


Figure 1. Sampling location and landuse within the Chewacla Creek watershed at CHWL-4.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Chewacla Creek at CHWL-4 is a *Fish & Wildlife (F&W)* stream reach located within the Fall Line Hills ecoregion in Lee County. Based on the 2000 National Land Cover Dataset, landuse within the watershed is composed of forest (51%), pasture/hay, and development (16%) (Figure 1). As of February 23, 2011, ADEM's NPDES Management System database showed 274 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. Instream substrates of Chewacla Creek at CHWL-4 were dominated by cobble with some gravel and sand. 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		
Basin	Tallapoosa River	
Drainage Area (mi²)	46	
Ecoregion^a	65i	
% Landuse		
Open water	2	
Wetland	Woody	2
	Emergent herbaceous	<1
Forest	Deciduous	33
	Evergreen	16
	Mixed	2
Shrub/scrub	4	
Grassland/herbaceous	3	
Pasture/hay	17	
Cultivated crops	4	
Development	Open space	9
	Low intensity	6
	Moderate intensity	1
	High intensity	<1
Barren	1	
Population/km^{2b}	109	
# NPDES Permits^c	TOTAL	274
	401 Water Quality Certification	5
	Construction Stormwater	255
	Mining	2
	Industrial General	7
	Municipal Individual	2
	Underground Injection Control	3

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 Chewacla Creek at CHWL-4, June 19, 2008.

Physical Characteristics		
Width (ft)	25	
Canopy Cover	Shaded	
Depth (ft)		
	Riffle	0.5
	Run	2.0
	Pool	4.0
% of Reach		
	Riffle	5
	Run	15
	Pool	80
% Substrate		
	Bedrock	2
	Boulder	5
	Cobble	69
	Gravel	10
	Sand	7
	Silt	5
	Organic Matter	2

Table 3. Results of the habitat assessment conducted on Chewacla Creek at CHWL-4, June 19, 2008.

Habitat Assessment	%Maximum Score	Rating
Instream Habitat Quality	68	Optimal >65
Sediment Deposition	68	Optimal >65
Sinuosity	60	Marginal (45-64)
Bank and Vegetative Stability	70	Sub-optimal (60-74)
Riparian Buffer	88	Sub-optimal (70-89)
Habitat Assessment Score	168	
% Maximum Score	70	Optimal >65

Table 4. Results of the macroinvertebrate bioassessment conducted in Chewacla Creek at CHWL-4, June 19, 2008

Macroinvertebrate Assessment			
	Result	Scores	Rating
Taxa richness measures		(0-100)	
# Ephemeroptera (mayfly)	8	67	Fair (47-70)
# Plecoptera (stonefly) genera	0	0	Very Poor (<16)
# Trichoptera (caddisfly) genera	10	83	Excellent (>83)
Taxonomic composition			
% Non-insect taxa	15	40	Poor (24.7-49.4)
% Non-insect organisms	36	6	Very Poor (<31.3)
% Plecoptera	0	0	Very Poor
Tolerance measures			
Beck's community tolerance	13	46	Fair (41.0-60.9)
WMB-I Assessment Score	--	35	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	23.0
Width (Ft)	1	25.0
Turbidity (NTU)	1	6.4
Total Dissolved Solids (mg/L)	1	54.0
Total Suspended Solids (mg/L)	1	3.0
Specific Conductance (µmhos)	1	210.5 ^G
Alkalinity (mg/L)	1	97.5
Stream Flow (cfs)	1	1.0
Chemical		
Dissolved Oxygen (mg/L)	1	6.8
pH (su)	1	7.7
Ammonia Nitrogen (mg/L)	1	< 0.015
Nitrate+Nitrite Nitrogen (mg/L)	1	0.155
Total Kjeldahl Nitrogen (mg/L)	1	0.405
Total Nitrogen (mg/L)	1	0.560
Dissolved Reactive Phosphorus (mg/L)	1	0.010
Total Phosphorus (mg/L)	1	0.020
CBOD-5 (mg/L)	1	< 1.0
Chlorides (mg/L)	1	2.6

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

WATER CHEMISTRY

One set of [in situ measurements](#) and water samples were collected during the macroinvertebrate assessment (Table 5). 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. Further monitoring should be conducted to identify the cause and source of the degraded biological conditions.

FOR MORE INFORMATION, CONTACT:
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