

2005 Monitoring Summary

Hatchet Creek at Tyler Ford (Coosa County) (32.91330/-86.28442)

BACKGROUND

Hatchet Creek, designated as an *Outstanding Alabama Water (OAW)*, is one of the streams monitored by the Alabama Department of Environmental Management (ADEM) as a “best attainable condition” reference watershed for larger riffle-run streams throughout the state.

A macroinvertebrate assessment was conducted on Hatchet Creek at HATC-3 on October 12, 2005. These data will be used to develop a nutrient target for the Cahaba River TMDL, monitor the health of Hatchet Creek, and to continue to refine ADEM’s nonwadeable, flowing biological assessment methods.

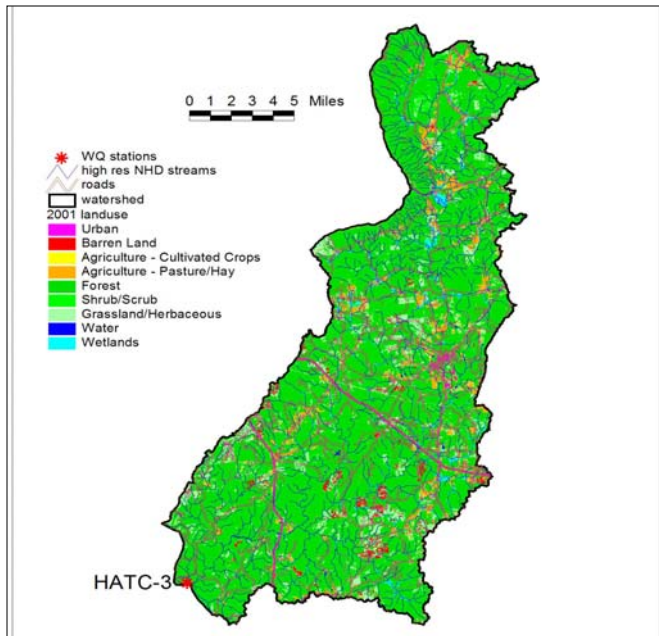


Figure 1. Sampling location and landuse within the Hatchet Creek watershed at HATC-3.

WATERSHED CHARACTERISTIC

Watershed characteristics are summarized in Table 1. Hatchet Creek at HATC-3 is a large *Outstanding Alabama Water (OAW)* stream located in the Southern Inner Piedmont ecoregion (45a) in Coosa County. Based on the 2006 National Land Cover Dataset, land cover within the watershed is approximately 78% forested with the remainder being grassland and pasture. As of February 23, 2011, ADEM’s NPDES Management System database shows a total of 37 permitted discharges located 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, as well as the quality and availability of habitat. Hatchet Creek at HATC-3 is a moderate-gradient, riffle-run stream characterized by bedrock, boulder, cobble and sand substrates. Because of the abundance and diversity of stable instream habitat and a large riparian buffer zone, overall habitat quality was categorized as *optimal* for supporting macroinvertebrate communities (Table 3).

Table 1. Summary of watershed characteristics based on the 2006 National Land Cover Dataset.

Watershed Characteristics		
Basin		Coosa River
Drainage Area (mi ²)		268
Ecoregion ^a		45a
% Landuse		
Open water		<1
Wetland	Woody	2
Forest	Deciduous	47
	Evergreen	30
	Mixed	1
Shrub/scrub		2
Grassland/herbaceous		8
Pasture/hay		4
Cultivated crops		<1
Development	Open space	4
	Low intensity	<1
	Moderate intensity	<1
	High intensity	<1
Barren		1
Population/km ^{2b}		8
# NPDES Permits ^c	TOTAL	37
Construction Stormwater		18
Mining		3
Industrial General		2
Industrial Individual		4
Municipal Individual		4
Underground Injection Control		6

a. Southern Inner Piedmont

b. 2000 US Census

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

Table 2. Physical characteristics of Hatchet Creek at HATC-3 on October 12, 2005.

Physical Characteristics		
Width (ft)		180
Canopy cover		Mostly Open
Depth (ft)	Riffle	0.8
	Pool	2.0
% of Reach	Riffle	70
	Pool	30
% Substrate	Bedrock	50
	Boulder	15
	Cobble	10
	Gravel	5
	Sand	15
	Silt	2
	Organic Matter	3

Table 3. Results of the habitat assessment conducted on Hatchet Creek at HATC-3 on October 12, 2005.

Habitat Assessment	% Max Score	Rating
Instream habitat quality	86	Optimal (> 70)
Sediment deposition	79	Optimal (> 70)
Sinuosity	90	Optimal (≥ 85)
Bank and vegetative stability	78	Optimal (≥ 75)
Riparian buffer	85	Sub-optimal (70-90)
Habitat assessment score	200	
% Maximum score	83	Optimal (> 70)

Table 4. Results of the macroinvertebrate bioassessment conducted in Hatchet Creek at HATC-3 on October 12, 2005.

Macroinvertebrate Assessment Results		
Taxa richness measures		
Total # taxa		75
# Ephemeroptera (mayfly) genera		6
# Plecoptera (stonefly) genera		6
# Trichoptera (caddisfly) genera		14
# Clinger taxa		29
Taxonomic composition measures		
% Non-insect taxa		9
% Non-insect organisms		31
% Nutrient tolerant organisms		17
% Plecoptera		2
Tolerance measures		
Beck's community tolerance index		27

BIOASSESSMENT RESULTS

Macroinvertebrate bioassessment results from Hatchet Creek at HATC-3 will be used as a benchmark for least-impaired conditions in non-wadeable, flowing streams. Seventy-five total taxa and fourteen caddisfly taxa were collected at the site. Becks Community Tolerance Index (BCTI) indicated the macroinvertebrate community to be healthy and intolerant of pollution (Table 4).

WATER CHEMISTRY

Results of monthly water quality data collected March through October are presented in Table 5. *In situ* measurements indicated that Hatchet Creek at HATC-3 was meeting its OAW use classification during each site visit. Median values of physical and chemical parameters without established criteria were similar to background levels as based on the 90th percentile of data collected in ecoregion 45a.

SUMMARY

Results of the 2005 macroinvertebrate and habitat assessments and monthly water quality data show Hatchet Creek at HATC-3 to be in good condition supporting the use of the site to collect data to develop a nutrient target for the Cahaba River TMDL, monitor the health of Hatchet Creek, and to continue to refine ADEM's nonwadeable, flowing biological assessment methods.

Table 5. 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 value.

Parameter	N	Min	Max	Median	Avg	SD
Physical						
Temperature (°C)	13	13.0	28.0	25.0	22.4	4.6
Turbidity (NTU)	13	4.0	48.2	6.8	10.3	11.7
Total dissolved solids (mg/L)	3	17.0	67.0	33.0	39.0	25.5
Total suspended solids (mg/L)	3	5.0	10.0	8.0	7.7	2.5
Specific conductance (µmhos)	13	33.2	50.6	41.8	42.0	5.3
Hardness (mg/L)	2	7.7	14.5	11.1	11.1	4.8
Alkalinity (mg/L)	3	9.4	14.3	9.7	11.1	2.7
Stream Flow (cfs)	8	143.9	414.7	266.4	267.3	---
Chemical						
Dissolved oxygen (mg/L)	13	7.3	9.9	8.0	8.4	0.9
pH (su)	13	6.2	8.09	7.2	7.1	0.5
Ammonia Nitrogen (mg/L)	3	< 0.015	0.030	0.015	0.018	0.011
Nitrate+Nitrite Nitrogen (mg/L)	3	0.007	0.403	0.046	0.152	0.218
Total Kjeldahl Nitrogen (mg/L)	3	< 0.150	0.186	0.075	0.112	0.064
Total Nitrogen (mg/L)	3	< 0.121	0.478	0.193	0.264	0.189
Dissolved reactive phosphorus (mg/L)	3	< 0.004	0.004	0.002	0.003	0.001
Total phosphorus (mg/L)	3	0.015	0.067	0.054	0.045	0.027
CBOD-5 (mg/L)	3	< 1.0	1.5	0.5	0.8	0.6
Chemical Oxygen Demand (mg/L)	2	< 2.0	< 2.0	1.0	1.0	0.0
Chlorides (mg/L)	3	3.8	4.6	3.8	4.1	0.5
Biological						
^J Chlorophyll <i>a</i> (µg/L)	3	0.53	1.07	0.53	0.71	0.3
Fecal Coliform (col/100 mL)	3	51	210	54	105	91

N=# of samples; J= estimate; M=value > 90th percent of ADEM's 45a reference reach samples.

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