

2006 Monitoring Summary



TM

Ulcanush Creek at Clark County Road 31 north of Coffeerville (31.78408/-88.10808)

BACKGROUND

The Ulcanush Creek watershed was selected for biological and water quality monitoring as part of the 2006 Assessment of the Escatawpa, Mobile, and Tombigbee (EMT) River Basins. The objectives of the EMT Basin Assessments were to assess the biological integrity of each monitoring site and to estimate overall water quality within the EMT basin group.

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 non-point sources in non-urban areas. Results of the 2001 screening-level evaluation identified Ulcanush Creek at ULCC-1 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. Ulcanush Creek at ULCC-1, January 2010.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Ulcanush Creek at ULCC-1 is a *Fish & Wildlife (F&W)* stream in Clarke County. Landuse within the watershed consists mostly of forest (77%) with some shrub/scrub and pasture/hay. There are no NPDES permits, and population density is very low in this watershed.

REACH CHARACTERISTICS

General observations (Table 2) and a habitat assesment (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. Ulcanush Creek at ULCC-1 is a low-gradient, glide-pool stream located in the Burhstone/Lime Hills ecoregion (Figure 1). Overall habitat quality was categorized as *marginal* due to a relatively straight stream channel, limited instream habitat, and eroding banks.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin	Lower Tombigbee River	
Drainage Area (mi ²)		32
Ecoregion ^a		65q
% Landuse		
Open water		<1
Wetland	Woody	2
	Emergent herbaceous	<1
Forest	Deciduous	13
	Evergreen	33
	Mixed	31
Shrub/scrub		10
Grassland/herbaceous		<1
Pasture/hay		6
Cultivated crops		1
Development	Open space	4
	Low intensity	<1
	Moderate intensity	<1
	High intensity	<1
Barren		<1
Population/km ^{2b}		6
# NPDES Permits ^c	TOTAL	0

a.Burhstone/Lime Hills

b.2000 US Census

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

Table 2. Physical characteristics of Ulcanush Creek at ULCC-1, May 24, 2006.

Physical characteristics		
Width (ft)		25
Canopy cover	Mostly Shaded	
Depth (ft)	Run	1.5
	Pool	2.5
% of Reach	Run	60
	Pool	40
% Substrate	Gravel	10
	Sand	67
	Silt	10
	Clay	5
	Organic Matter	8

Table 3. Results of the habitat assessment conducted on Ulanush Creek at ULCC-1, May 24, 2006.

Habitat Assessment (% Maximum Score)		Rating
Instream habitat quality	42	Marginal (40-52)
Sediment deposition	61	Sub-optimal (53-65)
Sinuosity	38	Poor (<45)
Bank and vegetative stability	41	Marginal (35-59)
Riparian buffer	80	Sub-optimal (70-90)
Habitat assessment score	114	
% Maximum score	52	Marginal (40-52)

BIOASSESSMENT RESULTS

Benthic macroinvertebrate communities were sampled using ADEM's Intensive Multi-habitat Bioassessment methodology (WMB-I). The WMB-I measures 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 an average of the score for each metric. Metric results indicated the macroinvertebrate community to be in *good* condition (Table 4).

Table 4. Results of the macroinvertebrate bioassessment of Ulanush Creek at ULCC-1 conducted on May 24, 2006.

Macroinvertebrate Assessment			
	Results	Scores	Rating
Taxa richness measures			
# EPT genera	18	72	Good (57-78)
Taxonomic composition measures			
% Non-insect taxa	7	89	Fair (61.9-92.7)
% Plecoptera	1	6	Good (5.7-52.8)
% Dominant taxa	23	68	Fair (47.1-70.5)
Functional composition measures			
% Predators	12	41	Fair (30.2-45.2)
Tolerance measures			
Beck's community tolerance index	18	82	Excellent (>65.9)
% Nutrient tolerant organisms	17	89	Excellent (>88.1)
WMB-I Assessment Score	---	64	Good (57-78)

WATER CHEMISTRY

Results of water chemistry analyses are summarized in Table 5. When possible, in situ measurements and water samples are collected monthly, semi-monthly (metals), or quarterly (pesticides, herbicides (atrazine), and semi-volatile organics) during March through October to help identify any stressors to biological communities. Hardness was higher than expected based on the 90th percentile of reference reaches in this ecoregion.

SUMMARY

Bioassessment results indicated the macroinvertebrate community in Ulanush Creek at ULCC-1 to be in *good* condition. Median concentrations of nutrients, total suspended and dissolved solids, and chlorides were similar to concentrations observed for reference reaches in the Burhstone/Lime Hills ecoregion. However, overall habitat quality was categorized as *marginal* due to poor sinuosity, limited instream habitat, and impaired bank and vegetative stability.

Table 5. 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.

Parameter	N	Min	Max	Median	Avg	SD
Physical						
Temperature (°C)	9	19.0	29.0	25.0	23.9	3.3
Turbidity (NTU)	9	6.5	15.7	8.8	9.2	2.8
Total Dissolved Solids (mg/L)	8	66.0	140.0	109.0	107.4	20.6
Total Suspended Solids (mg/L)	8	< 5.0	12.0	6.0	6.4	3.3
Specific Conductance (µmhos)	9	111.9	180.8	165.9	155.9	25.0
Hardness (mg/L)	3	49.0	100.0	86.0 ^M	78.3	26.4
Alkalinity (mg/L)	8	37.0	87.3	71.1	67.3	16.9
Stream Flow (cfs)	5	2.8	26.9	9.1	11.8	—
Chemical						
Dissolved Oxygen (mg/L)	9	7.2	9.4	8.0	8.1	0.7
pH (su)	9	7.2	7.9	7.5	7.6	0.2
Ammonia Nitrogen (mg/L)	8	< 0.01	0.05	0.008	0.013	0.015
Nitrate+Nitrite Nitrogen (mg/L)	8	< 0.003	0.522	0.02	0.085	0.177
Total Kjeldahl Nitrogen (mg/L)	8	< 0.15	2.0	0.237	0.486	0.65
Total Nitrogen (mg/L)	8	0.077	2.024	0.277	0.571	0.689
Dissolved Reactive Phosphorus (mg/L)	8	< 0.004	0.011	0.007	0.007	0.003
Total Phosphorus (mg/L)	8	< 0.004	0.051	0.039	0.033	0.02
CBOD-5 (mg/L)	8	< 1.0	2.4	1.4	1.5	0.6
COD (mg/L)	3	< 2.0	< 2.0	1.0	1.0	0.0
TOC (mg/L)	5	1.7	5.7	3.3	3.4	1.5
Chlorides (mg/L)	8	1.4	7.0	3.0	3.8	2.2
Atrazine (µg/L)	2	< 0.05	< 0.05	0.04	0.04	0.02
Total Metals						
Aluminum (mg/L)	3	< 0.1	0.88	0.28	0.403	0.429
Iron (mg/L)	3	1.01	1.25	1.21	1.157	0.129
Manganese (mg/L)	3	0.066	0.179	0.094	0.113	0.059
Dissolved Metals						
Aluminum (mg/L)	3	< 0.07	0.24	0.07	0.12	0.104
Antimony (µg/L)	3	< 7.5	< 7.5	3.8	3.8	0.0
Arsenic (µg/L)	3	< 5	< 5	2.5	2.5	0.0
Cadmium (mg/L)	3	< 0.0	< 0.0	0.0	0.0	—
Chromium (mg/L)	3	< 0.005	< 0.005	0.003	0.003	0.0
Copper (mg/L)	3	< 0.005	< 0.005	0.003	0.003	0.0
Iron (mg/L)	3	0.235	0.87	0.33	0.478	0.343
Lead (µg/L)	3	< 5	< 5	2.5	2.5	0.0
Manganese (mg/L)	3	< 0.005	0.176	0.047	0.075	0.09
Mercury (µg/L)	3	< 0.5	< 0.5	0.3	0.3	0.0
Nickel (mg/L)	3	< 0.005	0.014	0.0025	0.006333	0.007
Selenium (µg/L)	3	< 7.5	< 7.5	3.8	3.8	0.0
Silver (mg/L)	3	< 0.001	< 0.001	0.0	0.0	0.0
Thallium (µg/L)	3	< 2.5	9	4.5	3.4	1.9
Zinc (mg/L)	3	< 0.005	< 0.005	0.003	0.003	0.0
Biological						
Chlorophyll a (µg/L)	7	< 0.10	1.70	1.07	1.01	0.66
^J Fecal Coliform (col/100 mL)	5	41	120	80	78	31

N=# of samples; J=estimate; M=value > 90th percent of ADEM's 65q reference reach samples.

FOR MORE INFORMATION, CONTACT:
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