

2006 Monitoring Summary



White House Creek at White House Fork Road (Mobile County) (30.77626/-87.87133)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the White House Creek watershed 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 Assessment were to assess each monitoring site's biological integrity and to estimate overall water quality within the EMT basin group.



Figure 1. White House Creek at WHSB-1, January 2010.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. White House Creek at WHSB-1 is a *Fish & Wildlife (F&W)* stream in Mobile County. Land use within the watershed is forest (57%) with cultivated land, pastures, and wetlands (Table 1). As of Jun 9, 2008, the ADEM has issued 14 NPDES permits in this 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. White House Creek at WHSB-1 is a low gradient stream characterized by a sandy substrate (Figure 1). Habitat quality was rated as *optimal*.

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. Metric results indicated the macroinvertebrate community of White House Creek at WHSB-1 to be in *good* condition (Table 4).

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin		Mobile
Drainage Area (mi ²)		15
Ecoregion ^a		65f
% Landuse		
Open water		<1
Wetland	Woody	3
	Emergent herbaceous	<1
Forest	Deciduous	3
	Evergreen	41
	Mixed	13
Shrub/scrub		15
Grassland/herbaceous		<1
Pasture/hay		6
Cultivated crops		7
Development	Open space	8
	Low intensity	2
	Moderate intensity	1
	High intensity	1
Population/km ^{2b}		80
# NPDES Permits ^c	TOTAL	14
	Construction Stormwater	11
	Mining	2
	Underground Injection Control	1

a. Southern Pine Plains & Hills

b. 2000 US Census

c. #NPDES permits downloaded from ADEM's NPDES Management System database, 9 Jun 2008

Table 2. Physical characteristics of White House Creek at WHSB-1, May 16, 2006

Physical Characteristics		
Width (ft)		15
Canopy cover		Mostly Shaded
Depth (ft)		
	Run	1.5
	Pool	3.0
% of Reach		
	Run	60
	Pool	40
% Substrate		
	Gravel	10
	Sand	54
	Silt	3
	Organic Matter	30
	Mud/Muck	3

Table 3. Results of the habitat assessment of White House Creek at WHSB-1 on May 16, 2006.

Habitat Assessment	(% Max Score)	Rating
Instream habitat quality	77	Optimal (>65)
Sediment deposition	78	Optimal (>65)
Sinuosity	58	Marginal (45-64)
Bank and vegetative stability	86	Optimal (≥75)
Riparian buffer	86	Sub-optimal (70-90)
Habitat assessment score	174	
% Maximum score	79	Optimal (>65)

Table 4. Results of the macroinvertebrate bioassessment of White House Creek at WHSB-1 on May 16, 2006.

Macroinvertebrate Assessment			
	Results	Scores	Rating
Taxa richness measures			
# EPT genera	26	100	Excellent (>78)
Taxonomic composition measures			
% Non-insect taxa	13	63	Fair (61.9-92.7)
% Plecoptera	6	32	Good (5.7-52.8)
% Dominant taxa	10	100	Excellent (>85.2)
Functional composition measures			
% Predators	12	42	Fair (30.2-45.2)
Tolerance measures			
Beck's community tolerance index	32	100	Excellent (>65.9)
% Nutrient tolerant organisms	12	97	Excellent (>88.1)
WMB-I Assessment Score	---	76	Good (57-78)

WATER CHEMISTRY

Results of water chemistry analyses are presented 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 the biological communities. All parameters sampled were similar to the 90th percentile of reference reach data collected in the Southern Pine Plains and Hills ecoregion

SUMMARY

As part of the assessment process, ADEM will review the monitoring information presented in this report, along with all other available data.

Bioassessment results indicated the macroinvertebrate community in White House Creek at WHSB-1 to be in *good* condition. Overall habitat quality was rated as *optimal*. Nutrient, metal, and sediment samples resulted in concentrations similar to the 90th percentile of reference reach data collected in the Southern Pine Plains and Hills ecoregion.

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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. Metals results were compared to ADEM's chronic aquatic life use criteria adjusted for hardness.

Parameter	N	Min	Max	Med	Avg	SD
Physical						
Temperature °C	9	17.5	25.0	21.1	21.8	2.5
Turbidity (NTU)	9	2.2	4.8	3.8	3.6	0.8
Total Dissolved Solids (mg/L) ^J	8	26.0	79.0	39.0	44.0	18.8
Total Suspended Solids (mg/L) ^J	8	< 1.0	8.0	2.5	3.7	2.5
Specific Conductance (µmhos)	9	25.5	54.5	27.9	31.4	9.1
Hardness (mg/L)	3	7.0	32.0	31.0	23.3	14.2
Alkalinity (mg/L)	8	< 1.0	12.0	3.0	3.9	3.7
Stream Flow (cfs)	6	1.4	7.1	4.2	4.4	2.3
Chemical						
Dissolved Oxygen (mg/L)	9	5.7	8.1	6.8	6.9	0.7
pH (su)	9	5.4	6.1	5.8	5.7	0.2
Ammonia Nitrogen (mg/L)	8	< 0.010	0.050	0.008	0.012	0.015
Nitrate+Nitrite Nitrogen (mg/L)	8	< 0.003	0.045	0.024	0.023	0.017
Total Kjeldahl Nitrogen (mg/L)	8	< 0.150	0.620	0.345	0.376	0.174
Total Nitrogen	8	< 0.076	0.653	0.370	0.399	0.182
Dissolved Reactive Phosphorus (mg/L)	8	< 0.004	0.008	0.006	0.006	0.002
Total Phosphorus (mg/L)	8	< 0.004	0.050	0.030	0.025	0.015
CBOD-5 (mg/L)	8	< 1.0	2.2	0.8	1.2	0.8
Chlorides (mg/L)	8	< 1.9	7.3	3.0	3.6	2.3
Atrazine (µg/L)	2	< 0.05	<0.05	0.02	0.02	0.00
Total Metals						
Aluminum (mg/L)	3	0.160	0.240	0.220	0.207	0.042
Iron (mg/L)	3	1.510	2.560	2.010	2.027	0.525
Manganese (mg/L)	3	0.036	0.057	0.049	0.047	0.011
Dissolved Metals						
Aluminum (mg/L)	3	0.100	0.150	0.100	0.117	0.029
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	0.308	0.290	0.289	0.020
Lead (µg/L)	3	< 5	<5	3	3	0
Manganese (mg/L)	3	0.028	0.050	0.028	0.035	0.013
Mercury (µg/L)	3	< 0.5	<0.5	0.2	0.2	0.0
Nickel (mg/L)	3	< 0.005	0.010	0.002	0.005	0.004
Selenium (µg/L)	3	< 7.5	<7.5	3.8	3.8	0.0
Silver (mg/L)	3	< 0.001	<0.001	0.0005	0.0005	0.0
Thallium (µg/L)	3	< 2.5	9.0	4.5	3.4	1.9
Zinc (mg/L)	3	< 0.005	<0.005	0.002	0.002	0.000
Biological						
Chlorophyll a (µg/L)	8	< 0.10	3.20	1.08	1.61	1.24
Fecal Coliform (col/100 mL) ^J	5	10	80	40	39	27

J=estimate; N= # of samples; M=value >90% of collected samples in ecoregion 65f; C=value exceeds established criteria for F&W water use classification.