

2014 Monitoring Summary



West Fork Choctawhatchee River at Highway 105 (Dale County) (31.56967/-85.49735)

BACKGROUND

The West Fork of the Choctawhatchee River was identified as a Strategic Habitat Unit (SHU) by the Alabama Rivers & Streams Network (ARSN). SHUs are recognized as high-quality habitats occupied by federally listed and state imperiled species.

In cooperation with ARSN, the Alabama Department of Environmental Management (ADEM) selected the West Fork Choctawhatchee River watershed for biological and water quality monitoring as part of the Assessment of the Southeast Alabama (SE-AL) River basins. The objectives of this monitoring were to provide data to fully assess the biological, physical, and chemical conditions within the reach, to estimate overall water quality within the Southeast River Basin, and to provide data to support restoration efforts.

In a joint effort to meet these objectives, ADEM collected water samples from March to October of 2014, and the Geological Survey of Alabama (GSA) conducted a habitat and fish community assessment in June.



Figure 1. West Fork Choctawhatchee River at WFCD-4, July 12, 2014.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. West Fork Choctawhatchee River at WFCD-4 is a *Fish & Wildlife (F&W)* stream in Dale County. According to the 2011 National Land Cover Dataset, landuse within the watershed is primarily forest (49%) with some shrub/scrub and pasture/hay. There are five active NPDES outfalls in the watershed.

REACH CHARACTERISTICS

General observations (Table 2) and a habitat assessment (Table 3) were completed during the fish community 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. Bottom substrate in West Fork Choctawhatchee River at WFCD-4 is mostly sand (Figure 1). Overall habitat quality was rated as *marginal*.

BIOASSESSMENT RESULTS

The fish community in West Fork Choctawhatchee River at WFCD-4 was sampled using Alabama's Fish Community Index of Biotic Integrity (AL-IBI), developed through a multi-agency (GSA, ADCNR, ADEM) project to establish a comprehensive fish community bioassessment tool for wadeable streams and rivers across the State. The data collected during this survey were used to score the overall health of the fish community, based on conditions expected for wadeable streams and rivers in the Southern Plains Ichthyoregion. The AL-IBI uses twelve measures of species richness and diversity, tolerance/intolerance, and abundance, condition, and reproduction to assess the overall health of the fish community. The final IBI score is the sum of all individual metrics on a 60 point scale. The IBI score for West Fork Choctawhatchee River at WFCD-4 was 34, indicating the fish community to be in *poor* condition (Table 4).

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin	Choctawhatchee R	
Drainage Area (mi ²)	140	
Ecoregion ^a	65D	
% Landuse ^b		
Open water		1%
Wetland	Woody	5%
	Emergent herbaceous	<1%
Forest	Deciduous	20%
	Evergreen	24%
	Mixed	5%
Shrub/scrub		18%
Grassland/herbaceous		2%
Pasture/hay		11%
Cultivated crops		9%
Development	Open space	4%
	Low intensity	1%
	Moderate intensity	<1%
	High intensity	<1%
Barren		<1%
Population/km ^{2c}		8
# NPDES Permits ^d	TOTAL	5
	Construction	1
	Industrial Individual	4

^a.Southern Hilly Gulf Coastal Plain

^b.2011 National Land Cover Dataset

^c.2010 US Census

^d.#NPDES outfalls downloaded from ADEM's NPDES Management System database, April 1, 2016.

Table 2. Physical Characteristics of West Fork Choctawhatchee River at WFCD-4, June 5, 2014.

Physical Characteristics		
Canopy Cover	Mostly Open	
% of Reach		
	Run	60
	Pool	40
% Substrate		
	Sand	80
	Organic Matter	20

Table 3. Results of the habitat assessment conducted on West Fork Choctawhatchee River at WFCD-4, June 5, 2014.

Habitat Assessment	% Max Score	Rating
Instream Habitat Quality	37	Marginal (31-<55)
Sediment Deposition	25	Poor (<31)
Sinuosity	40	Marginal (31-<55)
Bank Vegetative Stability	44	Marginal (31-<58)
Riparian Buffer	24	Poor (<31)
Habitat Assessment Score	62	
% of Maximum Score	34	Marginal (31-<57)

Table 4. Results of the fish community bioassessment in West Fork Choctawhatchee River at WFCD-4, June 5, 2014.

Fish Community Assessment		Results	Score
Species Richness & Diversity			
Total native species		20	3
Number shiner species		5	3
Number of sucker species		0	1
Number of centrarchid species		3	1
Number of darter+madtom species		6	3
Tolerance & Intolerance Measures			
Percent of tolerant species		6.01	3
Percent Green Sunfish & Yellow Bullhead		2.19	1
Trophic Measures			
Percent insectivorous cyprinids		62.84	5
Percent invertivores		30.6	3
Percent top carnivores		1.64	3
Abundance, Condition & Reproductive Measures			
Percent DELT+hybrids		0	5
Number of lithophilic spawners		10	3
IBI Assessment Score			34
Condition			Poor

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 5. In situ measurements and water samples were collected monthly or semi-monthly (metals) during March through October of 2014 to help identify any stressors to the biological communities. Median values for specific conductivity and hardness were higher than median values of all verified ecoregional reference reach data collected in ecoregion 65d. Also, the single sample *F&W* use criterion for pathogens (*E. coli*) was exceeded during the June sampling event. However, this may be due to a large storm event at the time of sampling.

SUMMARY

Specific conductivity and hardness values were higher than expected when compared to other streams within the 65d ecoregion. *E. coli* concentrations exceeded *F&W* use summer geomean and single sample criteria. The fish community assessment was rated as *poor*, and habitat quality and availability was rated as *marginal*. Monitoring of this site should continue to ensure the habitat quality remains stable and water quality continues to meet *Fish & Wildlife* use criteria.

Table 5. Summary of water quality data collected March—October, 2014. Minimum (Min) and maximum (Max) values calculated using minimum detection limits (MDL). 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	E	Q
Physical								
Temperature (°C)	8	12.2	24.2	22.5	19.8	4.9		
Turbidity (NTU)	8	8.7	44.2	17.4	18.6	11.2		
Total Dissolved Solids (mg/L)	8	32.0	81.0	55.0	54.1	16.8		
Total Suspended Solids (mg/L)	8	3.0	37.0	12.0	14.2	11.0		
Specific Conductance (µmhos)	8	45.9	105.9	68.6 ^G	71.0	19.8		
Hardness (mg/L)	4	27.8	41.8	29.0 ^G	31.9	6.6		
Alkalinity (mg/L)	8	9.6	122.0	29.4	39.8	35.3		
Monthly Stream Flow (cfs)	2	39.2	58.4	48.8	48.8	13.6		
Stream Flow @ Sample Collection (cfs)	2	39.2	58.4	48.8	48.8	13.6		
Chemical								
Dissolved Oxygen (mg/L)	8	7.1	9.7	7.8	8.0	0.9		
pH (su)	8	6.8	7.4	7.1	7.1	0.3		
Ammonia Nitrogen (mg/L)	8	< 0.006	0.023	0.003	0.006	0.007		
Nitrate+Nitrite Nitrogen (mg/L)	8	0.134	0.474	0.238	0.262	0.106		
^J Total Kjeldahl Nitrogen (mg/L)	8	0.084	0.797	0.342	0.433	0.262		
^J Total Nitrogen (mg/L)	8	0.274	1.068	0.582	0.696	0.273		
^J Dissolved Reactive Phosphorus (mg/L)	8	< 0.003	0.006	0.005	0.005	0.001		
Total Phosphorus (mg/L)	8	0.017	0.042	0.026	0.027	0.009		
^J CBOD-5 (mg/L)	8	< 2.0	< 2.0	1.0	1.0	0.0		
Chlorides (mg/L)	8	2.9	4.2	3.7	3.6	0.4		
Total Metals								
^J Aluminum (mg/L)	4	0.065	0.567	0.210	0.263	0.214		
Iron (mg/L)	4	1.500	2.480	1.975	1.982	0.546		
Manganese (mg/L)	4	0.100	0.220	0.162	0.161	0.058		
Dissolved Metals								
^J Aluminum (mg/L)	4	< 0.050	0.070	0.046	0.047	0.025		
Antimony (µg/L)	4	< 0.2	< 0.4	0.1	0.1	0.1		
^J Arsenic (µg/L)	4	0.4	0.7 ^H	0.5	0.5	0.1	4	
Cadmium (mg/L)	4	< 0.246	< 0.390	0.123	0.141	0.036		
^J Chromium (mg/L)	4	0.483	0.615	0.525	0.537	0.056		
^J Copper (mg/L)	4	0.0003	0.001	0.0004	0.0005	0.0003		
Iron (mg/L)	4	0.816	1.360	0.912	1.000	0.253		
^J Lead (µg/L)	4	< 0.2	< 0.5	0.1	0.2	0.1		
^J Manganese (mg/L)	4	0.031	0.067	0.050	0.049	0.017		
Nickel (mg/L)	4	0.0002	0.001	0.0003	0.0004	0.0003		
Selenium (µg/L)	4	< 0.4	< 0.5	0.2	0.2	0.0		
Silver (µg/L)	4	< 0.252	< 0.460	0.126	0.152	0.052		
Thallium (µg/L)	4	< 0.2	< 0.6	0.1	0.2	0.1		
^J Zinc (mg/L)	4	0.003	0.011	0.003	0.005	0.004		
Biological								
Chlorophyll a (µg/L)	8	< 0.10	18.69	1.42	5.78	7.76		
<i>E. coli</i> (col/100mL)	8	65	1300 ^H	201	406	480	1	

E= # of exceedances; G= value higher than median concentration of all verified ecoregional reference reach data collected in the ecoregion 65d; H= *F&W* human health criterion exceeded; J= estimate; N= # samples; Q= # of uncertain exceedances.

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