

# 2014 Monitoring Summary



## Maye Creek at U.S. Hwy 29 in Escambia County (31.10124/-86.94736)

### BACKGROUND

Maye Creek at MYCE-1 was selected for the 2014 Southeast Alabama (SEAL) Basin Assessment. The objectives of the SEAL Basin Assessment were to assess the biological integrity of each monitoring site and to estimate overall water quality within the SEAL basins. Biological, chemical, and physical data were collected in 2014 for use in fully assessing Maye Creek for the 2016 Integrated Water Quality Report. Water chemistry samples were collected, and macroinvertebrate community and habitat assessments were conducted to assess impairment to aquatic communities. Furthermore, Maye Creek at MYCE-1 was also selected for reference reach monitoring to determine its reference status.



Figure 1. Maye Creek at MYCE-1, March 17, 2014.

### WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Maye Creek at MYCE-1 is located in the Southeastern Floodplains & Low Terraces (65p) ecoregion, which defines the floodplain of the Conecuh River and other large rivers throughout Alabama. However, the majority of the Maye Creek watershed is located within the Southern Pine Plains and Hills (65f) ecoregion. Based on the 2011 National Land Cover Dataset, landuse within the watershed is predominantly forest (78%). As of April 1, 2016, no NPDES outfalls are active in this 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. Maye Creek at MYCE-1 is a low-gradient, glide-pool stream with substrate composed primarily of sand with some gravel and organic matter (Figure 1). Overall habitat quality and availability were rated as *sub-optimal* for supporting diverse aquatic communities.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
<b>Basin</b>		Conecuh R
<b>Drainage Area (mi<sup>2</sup>)</b>		4
<b>Ecoregion<sup>a</sup></b>		65P
<b>% Landuse<sup>b</sup></b>		
	Wetland	Woody 1%
		Emergent herbaceous <1%
	Forest	Deciduous 5%
		Evergreen 60%
		Mixed 13%
	Shrub/scrub	9%
	Grassland/herbaceous	2%
	Pasture/hay	6%
	Cultivated crops	3%
	Development	Open space 1%
		Low intensity <1%
<b>Population/km<sup>2c</sup></b>		9

<sup>a</sup>. Southeastern Floodplains & Low Terraces

<sup>b</sup>. 2011 National Land Cover Dataset

<sup>c</sup>. 2010 US Census

Table 2. Physical characteristics of Maye Creek at MYCE-1, June 18, 2014.

Physical Characteristics		
<b>Width (ft)</b>		12
<b>Canopy Cover</b>		Shaded
<b>Depth (ft)</b>		
	Run	1.5
	Pool	3.0
<b>% of Reach</b>		
	Run	40
	Pool	60
<b>% Substrate</b>		
	Gravel	10
	Sand	78
	Organic Matter	12

**Table 3.** Results of the habitat assessment conducted on Maye Creek at MYCE-1, June 18, 2014.

Habitat Assessment	%Maximum Score	Rating
Instream Habitat Quality	50	Marginal (31-54)
Sediment Deposition	65	Sub-optimal (55-79)
Sinuosity	50	Marginal (31-54)
Bank and Vegetative Stability	60	Sub-Optimal (58-79)
Riparian Buffer	90	Optimal (>84)
<b>Habitat Assessment Score</b>	<b>113</b>	
<b>% Maximum Score</b>	<b>63</b>	<b>Sub-Optimal (57-80)</b>

**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 in *fair* condition (Table 4).

**Table 4.** Results of the macroinvertebrate community bioassessment conducted in Maye Creek at MYCE-1 on June 18, 2014.

Macroinvertebrate Assessment		
<b>Taxa richness and diversity measures</b>		
# EPT taxa		9
<b>Taxonomic composition measures</b>		
% Non-insect taxa		15
% Plecoptera		3
% Dominant taxon		29
<b>Functional feeding group</b>		
% Predators		17
<b>Community tolerance</b>		
Becks community tolerance index		4
% Nutrient tolerant individuals		12
<b>WMB-I Assessment Score</b>		<b>47</b>
<b>WMB-I Assessment Rating</b>		<b>Fair (37-55)</b>

**WATER CHEMISTRY**

Results of water chemistry analyses are presented in Table 5. In situ measurements and water samples were collected monthly, March through October of 2014 to help identify any stressors to the biological communities. The low stream pH was typical of coastal plain streams. The *F&W* water quality criterion for zinc was exceeded once. Median specific conductance and total manganese values were also higher than expected, based on data collected at reference reaches with in the Southern Pine Plains and Hills (65f) ecoregion.

**Table 5.** Summary of water quality data collected March-October, 2014. 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	Med	Avg	SD	E	Q
<b>Physical</b>								
Temperature (C)	8	12.4	25.0	20.8	19.5	3.9		
Turbidity (NTU)	8	1.4	7.4	1.9	2.6	1.9		
Total Dissolved Solids (mg/L)	8	25.0	25.0	25.0	41.0	13.7		
Total Suspended Solids (mg/L)	8	1.0	10.0	3.0	4.2	4.1		
Specific Conductance (micro-mhos/cm)	8	27	28.4	25.1	24.2	3.0		
Hardness (mg/L)	4	33	53	34	43	12		
Acidity (mg/L)	8	0.0	1.1	0.5	0.6	0.3		
Flow (Stream Flow (cfs))	8	0.4	4.7	0.2	0.6	1.3		
Stream Flow during Sample Collection	8	0.4	4.7	0.2	0.6	1.3		
<b>Chemical</b>								
Dissolved Oxygen (mg/L)	8	8.1	8.2	8.0	7.2	0.1		
pH	8	3.5	4.9	4.5	4.4	0.5		
Ammonia Nitrogen (mg/L)	8	0.000	0.010	0.000	0.004	0.001		
Nitrite Nitrogen (mg/L)	8	0.000	0.007	0.000	0.000	0.000		
Total Nitrogen (mg/L)	8	0.000	0.003	0.000	0.001	0.000		
Dissolved Reactive Phosphorus (mg/L)	8	0.000	0.000	0.000	0.000	0.000		
Total Phosphorus (mg/L)	8	0.000	0.010	0.000	0.001	0.000		
CECDS (mg/L)	8	0.00	0.00	0.00	0.00	0.00		
COO (mg/L)	7	0.0	43.3	12.7	21.0	19.9		
TOC (mg/L)	8	0.0	12.8	7.4	7.4	2.9		
Chloride (mg/L)	8	1.7	4.1	3.0	3.5	1.1		
<b>Total Metals</b>								
Aluminum (mg/L)	4	0.000	0.074	0.000	0.000	0.000		
Copper (mg/L)	4	0.000	0.407	0.000	0.000	0.000		
Manganese (mg/L)	4	0.024	0.000	0.000	0.000	0.000		
<b>Dissolved Metals</b>								
Aluminum (mg/L)	4	0.000	0.430	0.000	0.000	0.000		
Ammonium (mg/L)	4	0.00	0.04	0.00	0.00	0.00		
Arsenic (mg/L)	4	0.00	0.01	0.00	0.00	0.00		
Cadmium (mg/L)	4	0.040	0.000	0.000	0.000	0.000		
Copper (mg/L)	4	0.000	0.000	0.000	0.000	0.000		
Cobalt (mg/L)	4	0.000	0.000	0.000	0.000	0.000		
Cyanide (mg/L)	4	0.00	0.00	0.00	0.00	0.00		
Lead (mg/L)	4	0.00	0.00	0.00	0.00	0.00		
Manganese (mg/L)	4	0.024	0.000	0.000	0.000	0.000		
Nickel (mg/L)	4	0.000	0.000	0.000	0.000	0.000		
Selenium (mg/L)	4	0.04	0.00	0.00	0.00	0.00		
Silver (mg/L)	4	0.000	0.450	0.000	0.000	0.000		
Total (mg/L)	4	0.00	0.00	0.00	0.00	0.00		
Zinc (mg/L)	4	0.000	0.000	0.000	0.000	0.000		
<b>Biological</b>								
Chlorophyll (mg/L)	8	0.00	0.10	0.00	0.00	0.00		
Electrode Oxidation	8	0	112.7	4	0	360		

C = *F&W* criterion violated; E = # samples that exceeded criteria; H = *F&W* human health criterion exceeded; I = estimate; M = value >90% of collected samples in ecoregion 65f; N = # of samples; Q = # of uncertain exceedances; S = *F&W* hardness-adjusted aquatic life use criterion exceeded.

**SUMMARY**

The overall habitat quality for Maye Creek at MYCE-1 was categorized as *sub-optimal* for this stream type. Bioassessment results indicated the macroinvertebrate community to be in *fair* condition. The *F&W* water quality criterion for zinc was exceeded once. Median specific conductance and total manganese values were higher than expected based on data from ecoregional reference reaches.

FOR MORE INFORMATION, CONTACT:  
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