

2015 Monitoring Summary



Little Reedy Creek at Gainestowne Rd. (Clarke County) (31.43208/-87.74533)

BACKGROUND

Based on landuse, road density, and population density, Little Reedy Creek is among the least-disturbed watersheds within the Southeastern Alabama River Basins. It was therefore selected by the Alabama Department of Environmental Management (ADEM) as a candidate for “best attainable condition” reference watershed for comparison with streams throughout the Southern Pine Plains & Hills ecoregion (65F). Little Reedy Creek was monitored at LRDC-1 during 2015 to provide biological, chemical, and physical data that can be used to fully assess the site.



Figure 1. Little Reedy Creek at LRDC-1, April 6, 2015.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Little Reedy Creek is a Fish and Wildlife (F&W) stream that drains approximately 11 square miles in Clarke County. Based on the 2011 National Land Cover Dataset, landuse within the watershed is primarily forest (64%), with some areas of shrub/scrub, and very little pasture/cropland. Population density is low. As of April 1, 2016 ADEM has issued two 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. Little Reedy Creek at LRDC-1 is a low-gradient, glide-pool stream characterized by sandy substrates and thick aquatic vegetation (Figure 1, Figure 2). Overall habitat quality and availability was rated as *optimal* for supporting the macroinvertebrate community.

BIOASSESSMENT RESULTS

The benthic macroinvertebrate community was 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. The final score indicated the biological community at LRDC-1 to be in *excellent* condition (Table 4).

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Basin		Alabama R
Drainage Area (mi²)		11
Ecoregion^a		65F
% Landuse^b		
Open water		<1%
Wetland	Woody	<1%
	Emergent herbaceous	<1%
Forest	Deciduous	7%
	Evergreen	44%
	Mixed	13%
Shrub/scrub		21%
	Grassland/herbaceous	7%
	Pasture/hay	4%
Cultivated crops		<1%
Development	Open space	3%
	Low intensity	<1%
	Moderate intensity	<1%
	High intensity	<1%
Barren		<1%
Population/km^{2c}		11
# NPDES Permits^d	TOTAL	2
Construction		2

a. Southern Pine Plains & Hills

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 L. Reedy Creek at LRDC-1, May 5, 2015.

Physical Characteristics		
Width (ft)		15
Canopy Cover		Shaded
Depth (ft)		
	Run	1.2
	Pool	3
% of Reach		
	Run	60
	Pool	40
% Substrate		
	Clay	1
	Gravel	11
	Sand	68
	Organic Matter	20

Table 3. Results of the habitat assessment conducted on Little Reedy Creek at LRDC-1, May 5, 2015.

Habitat Assessment	% Maximum Score	Rating
Instream Habitat Quality	79	Optimal (>79)
Sediment Deposition	78	Sub-Optimal (55-79)
Sinuosity	93	Optimal (>79)
Bank Vegetative Stability	85	Optimal (>79)
Riparian Buffer	93	Optimal (>84)
Habitat Assessment Score	153	
% of Maximum Score	85	Optimal (>80)

Table 4. Results of macroinvertebrate assessment conducted in Little Reedy Creek at LRDC-1, May 5, 2015.

Macroinvertebrate Assessment		Results
Taxa richness and diversity measures		
# EPT taxa		27
Taxonomic composition measures		
% Non-insect taxa		5
% Plecoptera		19
% Dominant taxon		13
Functional feeding group		
% Predators		21
Community tolerance		
Becks community tolerance index		27
% Nutrient tolerant individuals		18
WMB-I Assessment Score		92
WMB-I Assessment Rating		Excellent (79-100)

WATER CHEMISTRY

Results of water chemistry analyses are summarized in Table 5. In situ measurements were collected March through October, 2015, to help identify any stressors to the biological community. Atrazine and organics samples were collected on June 16, 2015, and the results were below the Method Detection Limit. Median specific conductivity at LRDC-1 was above background conditions based on median conductivity measured at all ecoregional reference reaches located in ecoregion 65f. The low stream pH is typical of streams in ecoregion 65f.

Table 5. Summary of water quality data collected March-October, 2015. 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
Physical							
Temperature (°C)	10	16.1	21.0	20	19.2	1.6	
Turbidity (NTU)	10	1.1	4.0	1.7	2.0	1.0	
Specific Conductance (µmhos)	10	25.5	28.8	27.8 ^G	27.6	0.9	
Monthly Stream Flow (cfs)	10	13.4	19.5	16.3	16.5	1.6	
Stream Flow (cfs)	10	13.4	19.5	16.3	16.5	1.6	
Chemical							
Dissolved Oxygen (mg/L)	10	8.2	9.9	8.8	8.9	0.5	
pH (su)	10	5.3 ^C	6.3	5.7	5.7	0.3	9
Atrazine (µg/L)	1			<	0.01		

E=# samples that exceeded criteria; N=# samples; G=value higher than median of all verified ecoregional reference reach data collected in ecoregion 65f; C=F&W criterion violated.



Figure 2. Little Reedy Creek at LRDC-1, May 13, 2015.

SUMMARY

Landuse and population density categorize Little Reedy Creek among the least-disturbed watersheds in the Alabama basin. Habitat conditions were *optimal* for supporting biological communities. Bioassessment results show the both the macroinvertebrate community to be in *excellent* condition. However, specific conductance was elevated as compared to data from ADEM's least-impaired reference reaches in ecoregion 65F. Monitoring should continue to ensure that water quality and biological conditions remain stable.

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