

2005 Monitoring Summary



Basin Assessment Site

Salt Creek at Talladega County Road 103 (33.55104/-85.93057)

BACKGROUND

Alabama Department Environmental Management (ADEM) selected the Salt Creek watershed for biological and water quality monitoring as part of the 2005 Assessment of the Alabama, Coosa, and Tallapoosa (ACT) River Basins. The objectives of the ACT Basin Assessments were to assess the biological integrity of each monitoring site and to estimate overall water quality within the ACT basin group.

Table 1. Summary of watershed characteristics.

Watershed Characteristics		
Drainage Area (mi ²)		27
Ecoregion ^a		67f
% Landuse		
Open water		<1
Wetland	Woody	1
Forest	Deciduous	37
	Evergreen	24
	Mixed	2
Shrub/scrub		3
Grassland/herbaceous		8
Pasture/hay		15
Cultivated crops		3
Development	Open space	5
	Low intensity	<1
	Moderate intensity	<1
Barren		<1
Population/km ^{2b}		25
# NPDES Permits ^c	TOTAL	14
	Construction Stormwater	2
	Mining General Permit (old)	8
	Municipal Individual	4

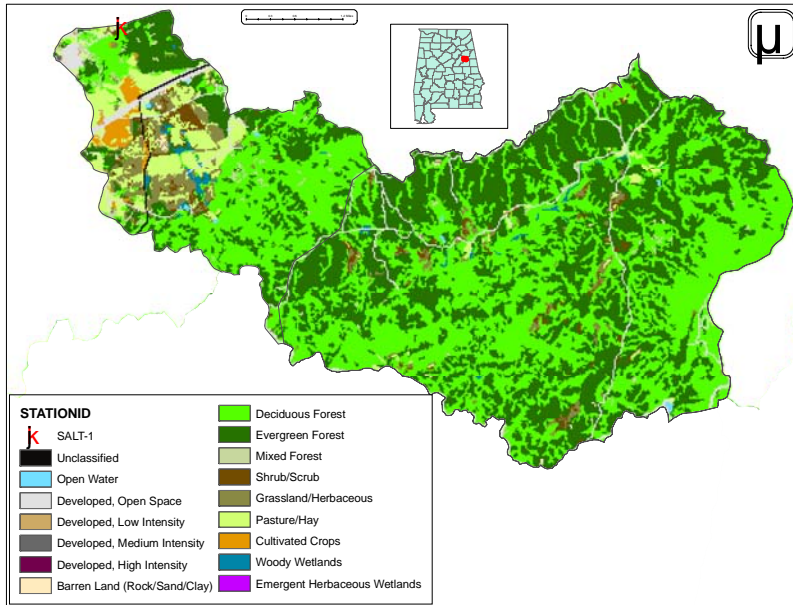


Figure 1. Sampling location and landuse within the Salt Creek watershed at SALT-1.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Salt Creek at SALT-1 is a small *Fish & Wildlife (F&W)* stream located in the Southern Limestone/Dolomite Valleys and Low Rolling Hills ecoregion. Landuse within the watershed is mainly forest (64%), pasture, grassland and agriculture (26%) (Fig.1). The town of Jenifer is located within the watershed.

REACH CHARACTERISTICS

General observations (Table 2) and habitat assessments (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. Salt Creek at SALT-1 is a low-gradient stream with cobble, gravel, and sand substrates. The presence of stable substrate and riffles within the stream reach categorized overall habitat quality as *optimal*. Sedimentation was noted as an issue in the reach, however.

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 an average of all individual metric scores. The final score indicated the biological community to be in *good* condition (Table 4).

Table 2. Physical characteristics of Salt Creek at SALT-1, June 28, 2005.

Physical characteristics		
Width (ft)		25
Canopy cover		Mostly Shaded
Depth (ft)	Riffle	0.4
	Run	0.7
	Pool	2.0
% of Reach	Riffle	10
	Run	80
	Pool	10
% Substrate	Boulder	5
	Cobble	10
	Gravel	40
	Sand	27
	Silt	15
	Organic Matter	3

Table 3. Results of the habitat assessment conducted on Salt Creek at SALT-1, June 28, 2005.

Habitat Assessment (% Maximum Score)		Rating
Instream habitat quality	72	Optimal (> 70)
Sediment deposition	63	Sub-optimal (59-70)
Sinuosity	68	Sub-optimal (65-84)
Bank and vegetative stability	76	Optimal (≥75)
Riparian buffer	80	Sub-optimal (70-90)
Habitat assessment score	171	
% Maximum score	71	Optimal (> 70)

Table 4. Results of the macroinvertebrate bioassessment conducted in Salt Creek at SALT-1, June 28, 2005.

Macroinvertebrate Assessment Results			
	Results	Scores	Rating
Taxa richness measures		(0-100)	
# Ephemeroptera (mayfly) genera	10	83	Good (71-85)
# Plecoptera (stonefly) genera	4	67	Good (50-75)
# Trichoptera (caddisfly) genera	11	92	Excellent (>83)
Taxonomic composition measures			
% Non-insect taxa	4	83	Good (74.1-87.1)
% Non-insect organisms	1	96	Good (93.9-97.0)
% Plecoptera	1	5	Very Poor (<6.56)
Tolerance measures			
Beck's community tolerance index	23	82	Excellent (>80.4)
WMB-I Assessment Score	---	73	Good (72-86)

WATER CHEMISTRY

Results of water chemistry are presented in Table 5. In situ measurements and water samples were collected monthly, semi-monthly (metals), or quarterly (pesticides, herbicides (atrazine), and semi-volatile organics) during March through October of 2005 to help identify any stressors to the biological communities. A total of 6200 colonies were counted in the fecal coliform sample collected on 7th June 2005. However, this sample was collected after a heavy rain on 6th June, 2005.

CONCLUSIONS

Habitat, bioassessment, and water quality data indicate the Salt Creek at SALT-1 to be in *good* condition although sedimentation was noted in the reach.

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Table 5. Summary of water quality data collected March-October, 2005. 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)	7	11.0	27.0	24.0	20.1	6.5
Turbidity (NTU)	7	2.3	77.8	4.0	14.4	28.0
Total dissolved solids (mg/L)	6	17.0	51.0	29.5	32.7	14.4
Total suspended solids (mg/L)	6	5.0	49.0	7.5	14.5	17.2
Specific conductance (µmhos)	7	34.2	55.2	38.8	40.9	6.9
Hardness (mg/L)	4	9.8	15.6	11.8	12.2	2.7
Alkalinity (mg/L)	6	6.9	15.7	11.1	11.0	2.9
Stream Flow (cfs)	7	2.5	52.1	25.3	25.3	---
Chemical						
Dissolved oxygen (mg/L)	7	7.3	10.4	8.0	8.7	1.2
pH (su)	7	6.1	7.7	7.2	7.1	0.6
Ammonia Nitrogen (mg/L)	6	< 0.015	< 0.015	0.008	0.008	0.000
Nitrate+Nitrite Nitrogen (mg/L)	6	0.012	0.111	0.025	0.037	0.037
Total Kjeldahl Nitrogen (mg/L)	6	< 0.150	0.576	0.075	0.234	0.246
Total nitrogen (mg/L)	6	0.162	0.687	0.181	0.320	0.234
Dissolved reactive phosphorus (mg/L)	6	< 0.004	0.061	0.005	0.014	0.023
Total phosphorus (mg/L)	6	< 0.004	0.090	0.037	0.041	0.032
CBOD-5 (mg/L)	6	< 1.0	2.8	1.3	1.5	1.1
Chlorides (mg/L)	6	3.8		4.0	4.0	0.2
Atrazine (µg/L)	2	< 0.05	< 0.05	0.03	0.03	0.00
Total Metals						
Aluminum (mg/L)	3	< 0.015	0.684	0.047	0.246	0.4
Iron (mg/L)	3	0.138	0.667	0.216	0.340	0.3
Manganese (mg/L)	3	< 0.005	0.061	0.029	0.031	0.0
Dissolved Metals						
Aluminum (mg/L)	3	< 0.015	< 0.015	0.0075	0.008	0.0
Antimony (µg/L)	3	< 2	< 2	1	1	0.0
Arsenic (µg/L)	3	< 10	< 10	5	5	0.0
Cadmium (mg/L)	3	< 0.005	< 0.005	0.0025	0.0025	0.0
Chromium (mg/L)	3	< 0.004	< 0.004	0.002	0.002	0.0
Copper (mg/L)	3	< 0.005	< 0.005	0.0025	0.003	0.0
Iron (mg/L)	3	< 0.005	< 0.033	0.02	0.0185	0.0
Lead (µg/L)	3	< 2	< 2	1	1	0.0
Manganese (mg/L)	3	< 0.005	< 0.005	0.0025	0.003	0.0
Mercury (µg/L)	3	< 0.3	< 0.3	0.15	0.2	0.1
Nickel (mg/L)	3	< 0.006	< 0.006	0.003	0.003	0.0
Selenium (µg/L)	3	< 10	< 10	5	5	0.0
Silver (mg/L)	3	< 0.003	< 0.003	0.0015	0.0015	0.0
Thallium (µg/L)	3	< 1	< 1	0.5	0.500	0.0
Zinc (mg/L)	3	< 0.006	< 0.006	0.003	0.003	0.0
Biological						
↓ Chlorophyll a (µg/L)	6	0.27	1.07	0.49	0.52	0.3
↓ Fecal Coliform (col/100 mL)	6	19	> 6200 ^c	40	1065	2516

J=estimate; N= # of samples; C=value exceeds established criteria for *Fish & Wildlife* water use