

2005 Monitoring Summary

Line Creek at Alabama Highway 110 Bullock County (32.20881/-85.89750)

BACKGROUND

The Alabama Department of Environmental Management (ADEM) selected the Line Creek watershed for biological and water quality monitoring as part of the 2005 Assessment of the Alabama, Coosa, and Tallapoosa (ACT) River Basins. Habitat and macroinvertebrate assessments are generally conducted to assess the biological integrity of each site to estimate overall water quality within each basin group. However, Line Creek at LINB-1 was very turbid with no flow, and these assessments could not be conducted.

WATERSHED CHARACTERISTICS

Watershed characteristics are summarized in Table 1. Line Creek at LINB-1 is a *Fish and Wildlife (F&W)* stream located in Bullock County and is a part of the Tallapoosa River Basin (Fig. 1). Landuse within the watershed is primarily forest (55%), with some agriculture (22%) and wetland (8%) areas.

REACH CHARACTERISTICS

Line Creek at LINB-1 is a low-gradient stream reach located in the Blackland Prairie ecoregion (*Griffith et al, 2001*). Streams in this region are generally low gradient with chalk, clay, sand or silt bottom substrates. A habitat assessment could not be conducted due to unwadeable conditions.

Table 1. Summary of Watershed Characteristics.

Watershed Characteristics		
Drainage Area (mi ²)		57
Ecoregion ^a		65a
% Landuse		
Open water		1
Wetland	Woody	7
	Emergent herbaceous	1
Forest	Deciduous	18
	Evergreen	20
	Mixed	17
Shrub/scrub		11
Pasture/hay		14
Cultivated crops		8
Development	Open space	3
	Low intensity	<1
	Moderate intensity	<1
Population/km ^{2b}		7
# NPDES Permits ^c	TOTAL	7
	Construction Stormwater	2
	Mining General Permit (old)	5

a.Blackland Prairie

b.2000 U.S. Census Data

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

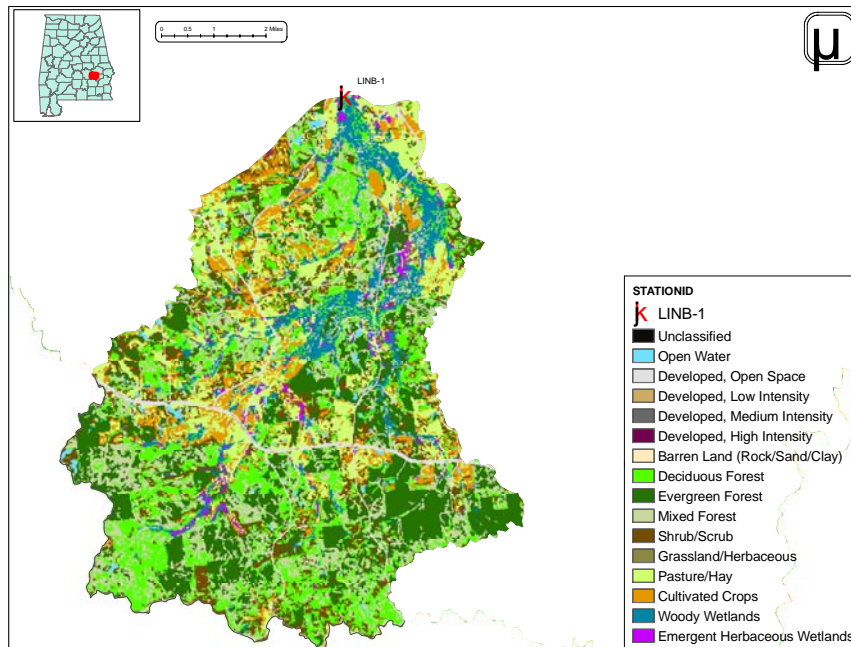


Figure 1. Sampling location and landuse within the Line Creek watershed at LINB-1.

WATER CHEMISTRY

Results of water chemistry analyses are presented in Table 2. Samples were collected monthly, semi-monthly (metals), or quarterly (pesticides, herbicides, and semi-volatile organics) during March through October of 2005. The median concentration of Atrazine was slightly elevated. Dissolved oxygen concentrations were below 5.0 mg/L during two of seven (28%) sampling events. Results for all other analyses were within expected ranges for the Blackland Prairie ecoregion.

CONCLUSIONS

Line Creek at LINB-1 was selected for biological and water quality monitoring as part of the 2005 Assessment of the ACT River Basins. However, because the reach was very turbid with no flow, habitat and macroinvertebrate assessments could not be conducted. Low flow conditions may have contributed to low dissolved oxygen concentrations measured during two site visits. Intensive water quality sampling indicated higher than expected concentrations of atrazine.

Table 2. Summary of water quality data collected March-October, 2005. Minimum (Min) and maximum (Max) values calculated using minimum detection limits (MDL) when re-sults 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	Median	Avg	SD
Physical						
Temperature (°C)	8	12.2	27.0	20.5	20.2	5.7
Turbidity (NTU)	7	11.5	32.0	23.7	22.5	6.4
Total Dissolved Solids (mg/L)	6	44.0	159.0	111.0	104.2	56.5
Total Suspended Solids (mg/L)	6	6.0	33.0	18.0	18.5	11.1
Specific Conductance (µmhos)	7	77.1	136.4	102.8	107.8	18.4
Hardness (mg/L)	4	< 1.0	49.1	37.7	31.3	21.9
Alkalinity (mg/L)	6	23.6	47.2	37.9	35.8	9.5
Chemical						
Dissolved Oxygen (mg/L)	7	4.2 ^C	9	7.7	6.8	1.9
pH (su)	7	6.7	8.16	7.3	7.2	0.5
Ammonia Nitrogen (mg/L)	8	< 0.015	0.088	0.008	0.022	0.028
Nitrate+Nitrite Nitrogen (mg/L)	8	< 0.003	0.102	0.048	0.044	0.037
Total Kjeldahl Nitrogen (mg/L)	8	< 0.150	0.980	0.411	0.532	0.329
Total Nitrogen (mg/L)	8	0.343	1.038	0.500	0.581	0.326
Dissolved Reactive Phosphorus (mg/L)	8	< 0.004	0.058	0.026	0.029	0.021
Total Phosphorus (mg/L)	8	< 0.004	0.164	0.094	0.088	0.048
CBOD-5 (mg/L)	8	< 1.0	4.7	2.2	2.3	1.3
COD (mg/L)	4	< 2.0	< 2.0	1.0	1.0	0.0
Chlorides (mg/L)	3	7.7	14.7	7.7	10.0	4.0
Atrazine (µg/L)	2	< 0.06	0.07	0.07 ^M	0.07	---
Total Metals						
Aluminum (mg/L)	5	< 0.015	0.299	0.225	0.206	0.118
Iron (mg/L)	5	< 0.005	2.08	1.71	1.413	0.812
Manganese (mg/L)	5	< 0.005	0.107	0.024	0.036	0.041
Dissolved Metals						
Aluminum (mg/L)	5	< 0.015	0.163	0.008	0.063	0.076
Antimony (µg/L)	5	< 2	< 2	1	1	0
Arsenic (µg/L)	5	< 10	< 10	5	5	0
Cadmium (mg/L)	5	< 0.005	< 0.005	0.003	0.003	0.000
Chromium (mg/L)	5	< 0.004	< 0.004	0.002	0.002	0.000
Copper (mg/L)	5	< 0.005	< 0.005	0.003	0.003	0.000
Iron (mg/L)	5	< 0.005	< 0.503	0.354	0.313	0.214
Lead (µg/L)	5	< 2	< 2	1	1	0
Manganese (mg/L)	5	< 0.005	0.025	0.003	0.008	0.010
Mercury (µg/L)	5	< 0.3	< 0.3	0.15	0.15	0.00
Nickel (mg/L)	5	< 0.006	< 0.006	0.003	0.003	0.000
Selenium (µg/L)	5	< 10	< 10	5	5	0
Silver (mg/L)	5	< 0.003	< 0.003	0.002	0.002	0.000
Thallium (µg/L)	5	< 1	< 1	0.5	0.5	0.0
Zinc (mg/L)	5	< 0.006	< 0.006	0.003	0.003	0.000
Biological						
^J Chlorophyll a (µg/L)	7	1.07	3.74	2.14	2.06	0.90
Fecal Coliform (col/100 mL)	7	40	830	120	275	287

J=estimate; N=# samples; Min=minimum; Max=maximum; M=value > 90% of all data within ecoregion 65a & 65b; C= Value exceeds criteria for *swimming & fish and wildlife* use classifications.

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