

US EPA ARCHIVE DOCUMENT

Appendix C

Fish Protocol & Stream Data

Rapid Bioassessment Protocol V Metric Development

The EPA RBP V (Barbour et. al., 1998) is based primarily on the Index of Biotic Integrity (IBI) (Karr, 1981; Fausch et al. 1984; Karr et al. 1986). The IBI incorporates up to twelve metrics which are scored to assess changes in the fish community compared to a reference stream, or a stream with minimal impact, of similar size and geographic area to that of the stream being sampled. Like stream insect communities, fish communities will respond to environmental change.

The EPA RBP V's (Barbour et. al., 1998) twelve metrics were originally developed for Midwestern streams. They are not intended to be used verbatim in other geographical areas. The metrics presented in the RBP document are prototypes to be used as guidance for developing metrics in other geographical areas. Barbour et. al. (1998) also present modifications to the IBI that other researches have made to make the IBI more applicable to their regions or study area. Metric development is based on reference fish community or a fish community with minimal impact.

After evaluating the fish data collected over the four year study, it was determined that selecting metrics that assessed the basic fish community structure was the most effective way to screen, or evaluate, streams in such a large geographical area, especially due to the nature of the study design. Ideally, when conducting any IBI study, metric development is based on a reference fish community in the area of study. As part of the study design a reference fish community would be established. However, the approach used in this study did not focus on establishing reference fish community data. This makes it difficult to develop metrics, with confidence, that are more discriminating of the subtle differences within a large watershed. The results of this IBI analysis should be used to identify problem areas in the Basin, at which point an IBI study, which involves the acquisition of the necessary reference data, can be implemented to address the problems areas.

Nine metrics were utilized to evaluate the data to assess the condition of stream fish assemblages (table 1). The metrics were selected from a pool of metrics listed in the EPA RBP document and other studies that have been conducted in Georgia (DeVivo 1996).

The first seven metrics assess the fish assemblage structure and the last two assess the fish assemblage function. The assemblage structure metrics will all decrease with increased stream degradation. Combined, these metrics assess impacts to the stream from physical and chemical degradation. Of the two assemblage function metrics, proportion of omnivores will increase with increased stream degradation, and proportion of benthic Invertivores will decrease with increased stream degradation.

No metrics that assess fish abundance and condition were

utilized for this study. Metrics 11 and 12 listed in the RBP document (Barbour et. al.1998), "Proportion of disease/anomalies" and "Proportion of Hybrids" requires a certain level of training to properly assess these metrics. The skill level among the sampling crews varied. Therefore, consistent assessment of these metrics was not possible. The abundance metric was not incorporated because of too much variance in the data. It was too difficult to determine any patterns or trends and establish scoring criteria for the metric.

The scoring criteria for each of the nine metrics were based on the data collected from the 82 lower Piedmont streams. Reliable reference data was unavailable for this study due to the nature in which sampling locations were selected. Therefore, an alternative method for developing scoring criteria was utilized. The range of metric results were trisected to produce three different ranges of results. A good result is given a score of 5, a medium range result is given a score of 3 and a lower range result is given a score of 1. This is considered an acceptable method for developing scoring criteria for IBI metrics (Karr, 1996). Metric scoring criteria are presented in Table 2.

Initially, scoring criteria were developed regardless of stream order. That is, the same criteria was applied to all three stream orders (1st, 2nd, and 3rd) that were sampled. Pearson Product Moment Correlation were calculated for all stream sampling parameters, which also included stream order and IBI score. A positive correlation was indicated for stream order and IBI score. This indicated that the IBI score increased with stream order designation, suggesting that the scoring criteria favored third order streams and that the other streams were scored unfairly. To resolve this issue the metric scores were recalibrated based on stream order. Separate scoring criteria were developed for each stream order, so that each stream order had its own set of scoring criteria for each metric. After the metrics were recalibrated to compensate for differences in stream order, Pearson Product Moment Correlation were recalculated and the results indicated there was no significant

Table 1 **List of IBI metrics utilized for the RBP analysis.**

Index of Biotic Integrity Metrics	
Fish Assemblage Structure Metrics	
1	Number of Species
2	Proportion of Non-Native Species
3	Brillioun Diversity Index
4	Number of Native Suckers
5	Number of Native Sunfishes
6	Number of Minnow Species
7	Number of Darter Species
Fish Assemblage Function Metrics	
8	Proportion of Omnivores
9	Benthic Invertivores

correlation between stream order and IBI score.

After all metrics were calculated and scored for a particular stream station, the metric scores were summed to give one final IBI score for that particular stream station. The condition of the fish community is then usually characterized as either "Good", "Fair", or "Poor", depending on how far the total score deviates from the total possible score. These characterizations were developed by applying box and whisker plots to the range of final scores. Scores that were in the upper 25 percentile (>29) were classified as being in Good condition. Scores that fell between the 25 and 75 percentile (22-29) were classified as being in Fair condition, and scores that were in the lower 25 percentile (<22) were classified as being Poor

Table 2 Scoring criteria for the metrics utilized for the RBP V (IBI) analysis.

		Stream	Metric Score Criteria		
Community Structure Metrics		Order	1	3	5
1	Number of Species	1	<5	5-7	>7
		2	<7	7-13	>13
		3	<9	9-14	>14
2	Proportion of Non-Native Species	1	>27	14-26	<14
		2	>16	8-16	<8
		3	>20	10-20	<10
3	Brillouin Diversity Index	1	<0.303	0.303-0.523	>0.523
		2	<0.34	0.34-0.60	>0.60
		3	<0.70	0.82-0.70	>0.82
4	Number of Native Suckers	1	0	0	1
		2	<2	2	>2
		3	<2	2	>2
5	Number Native Sunfish	1	<3	3-4	>5
		2	<3	3-4	>4
		3	<2	2-3	>3
6	Number of Minnow Species	1	<2	3-4	>4
		2	<3	3-4	>4
		3	<4	4-5	>5
7	Number of Darter Species	1	<1	1	>1
		2	<2	2	>2
		3	<1	1-2	>2
Community Function Metrics					
8	Proportion of Generalized Feeders	1	>62	31-62	<31
		2	>70	41-70	<41
		3	>43	22-43	<22

condition. An example of how a stream station is scored and

Table 3 Example of scoring IBI metric results.

Index of Biotic Integrity Metrics	Stream Station					
	93		122		37	
	Result	Score	Result	Score	Result	Score
1 Number of Species	19	5	2	1	13	3
2 Proportion of Non-Native Species	0.39	5	0.0	5	2.94	5
3 Brilllioun Diversity Index	0.88	5	0.09	1	0.77	3
4 Number of Native Suckers	3	5	1	1	1	1
5 Number of Native Sunfishes	4	5	0	1	2	3
6 Number of Minnow Species	4	3	2	1	5	3
7 Number of Darter Species	4	5	0	1	3	5
8 Proportion of Omnivores	18.99	5	100	1	31.62	3
9 Benthic Invertivores	34.11	5	0.00	1	11.76	1
Total IBI Score	43		13		27	
Classification	Good		Poor		Fair	

categorized is presented in Table 3.

References

Barbour, M. T., J. Gerritsen, B. D. Snyder, and J. B. Stribling. 1998. Draft Revision to Rapid Bioassessment Protocols for Use in Streams and Rivers. EPA 841-D-97-002, Office of Water, Washington, D. C.

DeVivo, J. C., C.A Couch, B.J. Freeman. 1996. Preliminary Index of Biotic Integrity in Urban Streams Around Atlanta, Georgia. Proceedings of the 1997 Georgia Water Resources Conference, held at The University of Georgia.

Fausch, K.D., J.R. Karr, and P.R. Yant. 1984. Regional Application of an Index of Biotic Integrity based on Stream Fish Communities. Transactions of the American Fisheries Society 113:39-55.

Karr, J.R. 1981. Assessment of Biotic Integrity Using Fish Communities. Fisheries 6:21-27

Karr, J.R. 1986, K.D. Fausch, P.L. Angermeier, P.R. Yant, and I.J. Schlosser. Assessment of Biological Integrity in Running Water: a Method and its Rationale. Illinois Natural History Survey Special Publication No. 5. Champaign Illinois. 28 pages.

Karr, J.R. 1996. Rivers as Sentinels: Using the Biology of Rivers to Guide Landscape Management in R.J. Naiman and R.E. Bilby (eds), Ecology and Management of Streams and Rivers in the Pacific Northwest Coastal Ecoregion. Springer-Verlag, New York, New York.

Summary of all Savannah REMAP Stream Data

Station ID	CYCLE	YEAR	Stream Order	Eco Region	Latitude (DMS)			Longitude (DMS)			State	AGPT	MI_HAB	MI_RICH	MI_EPT	FISH_IBI	PH	TEMP	DO	COND
4	0	94	1	LP	34	36	53.7993	82	41	37.7301	SC	34.08	76	11	3		6.9	21.3	7.9	45.3
8	0	94	3	LP	34	26	48.5681	83	2	40.6523	Ga	28.19	64	11	3	19	6.4	17.5	0.0	52.0
9	0	94	2	LP	34	26	47.0579	83	3	14.2553	Ga	36.17	94	12	4	25	6.5	23.0	0.0	60.0
10	0	94	3	LP	34	25	49.8077	83	2	28.9258	Ga	33.82	80	11	4	21	6.4	21.5	7.2	53.2
11	0	94	3	LP	34	27	22.0911	83	21	41.3815	Ga	11.84	47	12	3	25	6.6	21.0	0.0	55.0
12	0	94	3	LP	34	25	3.2074	83	2	40.8590	Ga	40.28	83	16	5	27	6.0	22.0	0.0	50.0
13	0	94	1	LP	34	26	46.6378	83	20	19.0241	Ga	18.63	61	9	3	28	6.5	19.5	0.0	50.0
14	0	94	3	LP	34	26	42.6550	83	21	27.4603	Ga	10.12	45	10	3	29	6.4	21.0	0.0	55.0
15	0	94	1	LP	34	19	42.0003	83	2	1.1208	Ga	41.33	87	7	2	23	5.4	21.0	0.0	45.0
19	0	94	3	LP	34	14	48.3613	82	56	14.6220	Ga	30.48	91	13	5	21	5.8	23.0	0.0	35.0
21	0	94	3	LP	34	14	28.5278	82	55	12.7644	Ga	38.43	67	14	5		6.9	21.0	7.9	33.8
22	0	94	2	LP	34	14	38.4142	82	56	46.4356	Ga	33.87	93	15	5	23	5.5	24.0	0.0	35.0
27	0	94	3	LP	34	2	9.1629	82	3	55.5302	SC	8.28	64	11	3	17	7.0	22.3	4.7	211.0
28	0	94	2	LP	33	58	4.9672	81	54	45.5302	SC	3.12	92	12	2	27	6.5	22.7	5.1	117.2
29	0	94	2	LP	33	57	2.2850	81	53	56.6145	SC	1.24	119	24	7	37	7.2	22.8	7.1	98.7
30	0	94	3	LP	33	56	35.4090	81	54	24.9065	SC	8.62	116	16	5	33	7.2	22.6	8.0	104.0
31	0	94	2	LP	34	2	42.8822	82	50	58.5292	Ga	8.16	87				7.0	20.9	8.1	78.0
32	0	94	3	LP	33	56	2.0761	81	54	52.4463	SC	4.23	112	14	5	35	7.4	22.7	7.9	101.6
33	0	94	1	LP	33	56	36.8479	82	14	21.7438	SC	8.42	75	15	4	21	7.2	22.3	7.2	243.0
34	0	94	3	LP	33	54	54.1530	82	1	9.6508	SC	10.18	113	20	6	39	7.0	22.4	5.9	93.2
37	0	94	3	LP	33	53	51.7284	82	1	9.4029	SC	23.09	111	21	7	27	7.1	22.9	7.5	91.4
38	0	94	3	LP	33	55	38.8549	82	52	49.6650	Ga	4.13	88	12	5	23	6.8	23.5	7.5	76.5
39	0	94	3	LP	33	55	42.2439	82	53	46.5835	Ga		82	16	2	31	6.7	23.2	6.1	78.7
41	0	94	2	LP	33	50	6.3653	82	39	2.7338	Ga	3.25	48	16	4	35	6.7	25.3	6.2	110.4
44	0	94	1	LP	33	43	58.8046	81	54	24.7820	SC	3.46	75	9	3		6.9	23.4	7.6	67.1
45	0	94	2	LP	33	41	49.2998	82	43	32.5372	Ga	59.51	45	7	1		7.5	27.4	5.9	3260.0
48	0	94	3	SH	33	15	21.9660	82	20	1.5107	Ga	30.36	108	8	3		6.7	24.8	6.9	914.0
49	0	94	3	SH	33	15	19.3664	82	19	59.9691	Ga	28.45	92	9	4		6.8	25.6	7.5	677.0
51	0	94	1	SP	33	0	5.8158	81	24	2.8706	SC	1.54	120	11	2		7.4	22.7	7.1	36.1
57	0	94	3	SP	32	56	4.1333	81	48	1.8028	Ga	8.74	111	17	3		7.5	21.2	6.4	184.0
61	1	95	2	BR	34	55	43.5823	83	7	50.1026	SC	1.41	99	23	14		6.9	16.6	8.9	16.0
64	1	95	2	LP	34	47	48.7826	82	37	51.8720	SC	1.71	45	15	7	19	6.8	20.0	8.1	
65	1	95	2	LP	34	47	3.6141	82	36	22.0255	SC	3.33	41	11	5	17	6.5	22.0	7.4	
68	1	95	2	LP REF	34	38	17.2747	83	19	55.0356	Ga	2.46	104	30	15	31	7.2	21.4	8.3	35.0
69	1	95	1	LP	34	37	42.2113	83	18	29.6489	Ga	1.40	84	23	12	19	7.4	21.2	8.4	37.0
71	1	95	1	LP	34	30	41.9353	82	27	58.4868	SC	17.96	76	19	8	19	6.4	22.5	7.6	
72	1	95	1	LP	34	30	57.1580	83	28	26.7501	Ga	3.79	82	27	18	21	7.3	20.4	8.4	36.0
74	1	95	2	LP	34	20	37.3851	82	39	48.5095	SC	2.06	41	20	9	35	6.8	21.1	7.8	50.6
75	1	95	2	LP	34	19	56.7644	82	38	39.8460	SC	11.23	54	23	9	31	6.9	21.4	7.7	49.6
77	1	95	1	LP REF	34	20	56.6465	83	2	3.1563	Ga	2.57	105	25	10	21	6.9	20.4	7.8	35.0
78	1	95	1	LP	34	10	45.7994	82	17	5.8484	SC	1.66	91	11	4	29	7.4	23.8	7.9	96.0

Summary of all Savannah REMAP Stream Data

Station ID	CYCLE	YEAR	Stream	Eco	Latitude (DMS)			Longitude (DMS)			State	AGPT	MI_HAB	MI_RICH	MI_EPT	FISH_IBI	PH	TEMP	DO	COND
			Order	Region																
79	1	95	3	LP	34	8	27.1407	82	17	14.9103	SC		53	16	7	23	7.6		7.9	125.0
80	1	95	3	LP	34	8	11.3255	82	17	51.3748	SC	13.12	52	22	8	21	7.4	22.0	7.9	123.0
81	1	95	3	LP	34	7	43.1356	82	18	12.2856	SC	8.26	52	23	8	25	7.3	23.0	7.6	125.0
82	1	95	3	LP	34	6	6.7529	82	28	39.8788	SC	3.96	107	28	8	25	7.3	25.0	7.6	101.0
83	1	95	1	LP	34	12	15.4883	83	25	26.0343	Ga	0.55	66	23	11	19	6.7	20.3	7.7	44.0
85	1	95	1	LP	34	8	43.1670	82	57	23.1062	Ga	4.80	45	23	5	33	6.8	22.3	5.4	52.0
86	1	95	3	LP	34	5	6.1063	82	28	36.4788	SC	4.58	72	25	9	25	7.8	26.7	8.5	102.7
87	1	95	2	LP	34	8	18.6496	82	57	24.4861	Ga	7.03	30	19	7	21	6.7	22.2	5.9	51.0
88	1	95	3	LP	34	4	32.8378	82	28	27.1207	SC	5.97	68	27	11	27	7.3	22.8	6.5	108.0
89	1	95	2	LP	34	4	38.9293	82	30	18.6960	SC	4.55		18	4	27	7.2	25.1	4.8	150.0
93	1	95	3	LP REF	33	48	16.0738	82	7	57.4444	SC		104	26	10	43	7.6	26.0	8.2	146.9
94	1	95	3	LP REF	33	48	7.1642	82	8	13.9907	SC		59	17	8	39				
95	1	95	3	LP	33	47	59.2036	82	7	23.9716	SC	1.34	99	32	10	39	9.1	28.2	11.3	146.5
96	1	95	2	LP	33	46	51.1624	82	8	34.7175	SC	2.06	103	22	10	23	7.4	21.5	7.2	
97	1	95	1	LP	33	52	1.2324	83	9	52.4866	Ga	1.46	40	21	11		6.8	21.7	6.3	62.0
98	1	95	1	LP	33	37	11.4077	82	22	33.5640	Ga		69	30	12	25	6.4	22.2	3.6	76.0
99	1	95	2	LP	33	35	15.4617	82	12	46.2592	Ga	8.57	72	23	8	31	7.1	25.2	5.2	105.0
100	1	95	3	LP	33	35	31.1643	82	41	13.5212	Ga	4.97	49	21	8	29	7.2	26.4	6.2	107.0
101	1	95	3	LP	33	35	28.7033	82	41	51.5983	Ga	11.06	48	20	6	27	7.2	26.6	6.2	104.0
102	1	95	3	LP	33	35	7.9421	82	42	12.1633	Ga	0.82	49	15	6	27	7.3	26.3	5.9	103.0
103	1	95	1	LP	33	34	54.0984	82	40	22.8367	Ga	1.34	89	22	8	35	7.6	24.4	7.1	187.0
104	1	95	1	LP	33	32	41.1923	82	39	50.4017	Ga	3.07	70	12	6	37	7.0	22.7	7.9	91.1
113	1	95	2	SH	33	15	55.8165	81	57	21.6129	Ga	7.37	104	26	10		6.9	24.4	6.7	32.0
114	1	95	1	SP	33	7	22.9653	81	51	2.9919	Ga	6.66	78	14	6		6.5	20.9	6.3	37.0
121	2	96	2	BR	34	49	59.4444	83	35	29.5255	Ga	1.58	89	22	14		6.9	16.5	7.9	24.0
122	2	96	2	LP	34	32	45.2830	83	18	11.5174	Ga	6.41	53	16	5	13	7.2	24.2	8.2	691.0
123	2	96	2	LP	34	10	27.1961	83	17	2.2760	Ga	4.94	86	21	6	27	6.8	22.3	7.3	52.0
127	2	96	1	UP	34	49	25.9638	82	58	42.8228	SC	3.96	112	32	16		7.0	22.0	8.2	40.0
130	2	96	1	LP	34	32	36.8223	82	58	0.7518	SC	15.93	54	16	1	25	6.8	26.0	7.2	50.0
131	2	96	2	LP	34	32	45.4489	82	57	22.3898	SC	4.59	62	22	8	33	6.8	24.5	8.6	40.0
132	2	96	2	LP	34	31	28.9133	82	57	22.5618	SC	7.88	48	19	8	25	7.1	26.5	7.5	45.0
133	2	96	3	LP	34	31	46.5814	82	57	5.6190	SC	13.58	62	21	7	23	6.8	26.0	8.0	50.0
135	2	96	2	LP	33	46	25.7746	82	58	59.2704	Ga	2.79	75	22	7	31	6.9	24.1	5.4	142.0
136	2	96	1	UP	34	54	4.4831	82	46	53.2661	SC	2.03	102	19	11		6.3	19.5	8.5	20.0
138	2	96	2	UP	34	55	12.6118	82	45	38.6099	SC	5.80	82	26	16		7.0	22.0	8.2	30.0
143	2	96	3	LP	34	39	20.7134	82	38	31.9222	SC	7.73	93	22	10	21	7.1	24.0	8.0	50.0
144	2	96	3	LP	34	38	22.9730	82	38	37.6329	SC	3.25	51	24	10	19	7.1	25.0	7.5	50.0
145	2	96	3	LP	34	38	50.4543	82	38	25.1805	SC	3.60	47	26	11	19	6.9	22.0	8.0	45.0
147	2	96	3	LP	34	39	40.2584	82	37	47.9485	SC	3.97	48	19	10	21	7.1	25.5	8.1	45.0
148	2	96	1	LP	33	37	37.8644	82	47	12.3996	Ga	7.11	55	24	9	25	7.6	23.2	7.2	42.0
149	2	96	2	LP	34	26	55.3141	82	37	39.0583	SC	22.19	52	15	6	19	6.7	22.5	7.7	130.0

Summary of all Savannah REMAP Stream Data

Station ID	CYCLE	YEAR	Stream	Eco	Latitude (DMS)			Longitude (DMS)			State	AGPT	MI_HAB	MI_RICH	MI_EPT	FISH_IBI	PH	TEMP	DO	COND
			Order	Region																
151	2	96	2	LP	34	25	50.3552	82	36	54.0540	SC	19.17	51	18	5	23	6.8	23.0	7.5	130.0
154	2	96	2	LP	33	48	13.7570	82	29	42.0120	Ga	16.95	68	27	11	27	6.9	23.6	7.0	82.0
155	2	96	2	LP	A	48	7.6710	82	29	41.8078	Ga	9.16	71	32	10	29	6.9	23.2	6.8	77.0
155.1	2	96	3	LP	B	49	17.0757	82	29	26.3316	Ga	3.82	72	20	8	27	7.1	24.7	7.4	112.0
162	2	96	1	LP	33	35	49.7968	81	55	35.6942	SC	1.15	95	16	9	15	5.1	20.0	7.7	15.0
163	2	96	2	SP REF	33	3	1.0792	81	54	53.5055	Ga	13.62	102	26	7		7.3	24.0	6.6	128.0
164	2	96	2	SP REF	33	4	3.3065	81	54	42.1236	Ga	2.97	98	24	7		7.3	23.3	7.1	119.0
166	2	96	2	SP REF	33	2	57.2257	81	54	21.7342	Ga	20.67	104	27	11		6.8	22.2	8.3	86.0
167	2	96	3	SP	33	3	40.2696	81	53	41.3849	Ga	10.82	99	22	7		7.2	24.6	8.2	100.0
176	2	96	2	MACP	32	35	19.1747	81	26	41.7862	Ga	2.51	99	14	1		6.0	25.8	6.9	60.0
177	2	96	1	MACP	32	31	57.0028	81	27	18.6763	Ga	0.31	96	14	1		4.1	25.6	5.1	58.0
186	3	97	2	BR	35	0	31.3210	82	49	14.8715	SC	3.00	123	25	16		7.0	23.7	8.0	24.0
187	3	97	3	BR	35	0	12.3063	82	49	37.5836	SC	3.00	91	36	20		7.4	22.3	8.5	29.0
189	3	97	3	BR	34	59	46.4191	82	49	40.7735	SC	3.13	87	35	19		7.6	22.4	8.5	27.0
191	3	97	2	BR	34	52	3.5187	83	8	10.8764	SC	1.52	92	32	20		7.4	19.3	8.7	24.0
192	3	97	2	BR	34	51	41.4279	83	9	58.7073	SC	1.99	91	29	17		6.8	19.4	8.7	26.0
193	3	97	1	BR	34	51	15.5872	83	9	0.6364	SC	1.52	60	13	5		6.9	18.9	9.5	32.0
194	3	97	2	BR	34	51	6.1637	83	8	40.5458	SC	1.45	82	31	17		7.1	19.8	9.3	24.0
195	3	97	3	BR	34	50	36.4122	83	9	12.9877	SC	1.50	110	30	18		6.6	21.9	8.7	24.0
196	3	97	1	BR	34	48	55.1103	83	14	10.5392	SC	4.40	58	20	8		6.9	19.5	8.7	21.0
197	3	97	1	LP	34	22	46.7383	82	54	2.9064	Ga	2.50	52	16	6	21	6.2	21.9	7.2	29.0
200	3	97	2	LP	34	17	23.0683	82	43	33.0550	SC	28.21	58	24	11	19	7.0	24.0	7.3	65.0
205	3	97	2	LP	34	12	17.6608	82	50	58.5352	Ga	7.19	63	17	5	19	6.7	21.5	8.2	32.0
207	3	97	1	LP	34	14	14.2111	83	22	43.9620	Ga	15.98		19	6	33				
210	3	97	3	LP	34	9	47.0635	83	3	59.4713	Ga	7.38	103	18	9	23	7.2	22.7	9.0	40.0
211	3	97	3	LP	34	9	23.5813	83	6	5.3189	Ga	25.70		19	7	25				
213	3	97	1	LP	34	8	23.9605	83	5	18.1675	Ga	12.53	57	24	12	21	6.9	21.0	7.9	541.0
214	3	97	1	LP	34	7	48.7219	83	17	19.2083	Ga	3.30	74	15	7	27	6.5	19.8	8.0	379.0
216	3	97	2	LP	34	0	42.9311	82	22	52.1874	SC	20.02	46	21	9	17	6.8	22.8	8.1	111.0
221	3	97	2	LP	33	42	0.1361	82	2	45.8011	SC	3.07	67	21	12	23	7.0	25.3	7.5	80.0
222	3	97	2	LP	33	41	22.6965	82	0	43.3443	SC	4.91	66	18	8	25	6.9	26.4	6.4	121.0
224	3	97	3	LP	33	40	40.1499	82	36	7.4409	Ga	13.63		24	11	35				
231	3	97	3	SH REF	33	26	43.8063	81	36	4.6489	SC	2.10	92	24	11		5.2	20.9	7.9	19.0
232	3	97	3	SH	33	25	57.1961	81	36	17.6399	SC	4.81	95	21	11		5.3	21.2	7.4	18.0
236	3	97	2	SP	33	5	35.8071	81	31	9.3483	SC	2.85	73	19	8		6.1	25.4	6.4	38.0
237	3	97	2	SP	33	4	44.9632	81	30	4.5215	SC	6.04	88	21	9		6.4	25.5	7.3	47.0
238	3	97	1	SP	33	6	15.7579	81	47	38.8681	Ga	7.26		16	7					

BR= Bluridge, **LP**= Lower Piedmont, **UP**= Upper Piedmont, **SH**= Sand Hills, **SP**= Southeastern Plains, **MACP**= Midatlantic Coastal Plains , **REF**= Reference

Macroinvertebrate
Raw Data

[illegible]

Macroinvertebrate
Raw Data

[illegible]

Macroinvertebrate Raw Data		STATIONS																				
ORGANISMS		4	8	9	10	11	12	13	14	15	19	21	22	27	28	29	30	32	33	34	37	38
Ptilodactylidae																						
CRUSTACEA																						
Astacidae		X	X	X		X	X	X	X		X	X	X	X	X	X		X	X	X		
Isopoda																						
Amphipoda															X	X				X		
Palaemonidae																						
OLIGOCHAETA																						
Glossosophoniidae																						
Naididae																						
Tubificidae													X					X			X	X
Lumbriculidae				X																X		
HIRUDINEA							X														X	
HYDRACARINA															X	X	X			X	X	
MOLLUSCA																						
Bivalvia																						
Gastropoda undet. sp.																						
Unionidae																	X	X			X	
Corbiculidae													X			X					X	
Lymnaeidae																						
Sphaeriidae																				X		
Physidae																						
Viviparidae																						
Planorbidae																X					X	
Pleuroceridae																						
Ancylidae																						
TAXA RICHNESS		11	11	12	11	12	16	9	10	7	13	14	15	11	12	24	16	14	15	20	21	12
EPT INDEX		3	3	4	4	3	5	3	3	2	5	5	5	3	2	7	5	5	4	6	7	5
HABITAT SCORE		76	64	94	80	47	83	61	45	87	91	67	93	64	92	119	116	112	75	113	111	88

Macroinvertebrate
Raw Data

ORGANISMS	39	41	44	45	48	49	51	57	61	64	65	68	69	71	72	74	75	77	78	79	80
DIPTERA																					
Tabanidae																					
Empididae																					
Tipulidae									X			X	X	X	X	X	X	X			
Tanyderidae																					
Rhagionidae																					
Culicidae																X					
Ptychopteridae																					
Dixidae												X	X	X	X			X			
Ceratopogonidae		X							X												
Chironomidae	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Blephariceridae																					
Simuliidae	X	X			X		X		X	X	X	X	X	X	X		X	X		X	
TRICHOPTERA																					
Hydroptilidae																					
Helicopsychidae																					
Hydropsychidae	X	X		X					X	X	X	X	X	X	X	X	X	X	X	X	X
Rhyacophilidae									X			X	X		X						
Limnephilidae										X	X	X	X	X	X		X	X		X	X
Phryganeidae																					
Polycentropidae									X			X	X		X						
Psychomiidae												X			X			X			
Philopotamidae									X			X	X				X				
Dipseuopsidae																					
Brachycentridae									X			X									
Goeridae																					
Lepidostomatidae					X	X							X	X	X			X			
Calamoceratidae																					
Uenoidae																					
Molannidae																					
Odontoceridae																		X			
Leptoceridae						X					X			X		X					X
Glossosomatidae												X			X						
PLECOPTERA																					
Perlidae					X	X			X	X	X	X	X	X	X	X	X	X			X
Perlodidae									X						X			X			
Peltoperlidae									X			X	X		X						
Capniidae									X						X						
Leuctridae															X						
Nemouridae																					
Pteronarcyidae									X	X		X			X		X			X	X

Macroinvertebrate
Raw Data

ORGANISMS	39	41	44	45	48	49	51	57	61	64	65	68	69	71	72	74	75	77	78	79	80
Ptilodactylidae																		X			
CRUSTACEA																					
Astacidae	X	X					X	X	X				X	X	X	X	X	X			X
Isopoda								X										X			
Amphipoda	X	X					X														
Palaemonidae	X							X													
OLIGOCHAETA												X						X			
Glossosophoniidae																					
Naididae																					
Tubificidae		X																			
Lumbriculidae										X	X			X							
HIRUDINEA		X						X													
HYDRACARINA																					
MOLLUSCA																					
Bivalvia																					
Gastropoda undet. sp.												X	X								
Unionidae	X							X													
Corbiculidae												X								X	X
Lymnaeidae																					
Sphaeriidae																					
Physidae																	X				
Viviparidae																					
Planorbidae								X													
Pleuroceridae								X													
Ancylidae																					
TAXA RICHNESS	16	16	9	7	8	9	11	17	23	15	11	30	23	19	27	20	23	25	11	16	22
EPT INDEX	2	4	3	1	3	4	2	3	14	7	5	15	12	8	18	9	9	10	4	7	8
HABITAT SCORE	82	48	75	45	108	92	120	111	99	45	41	104	84	76	82	41	54	105	91	53	52

Macroinvertebrate
Raw Data

ORGANISMS	81	82	83	85	86	87	88	89	93	94	95	96	97	98	99	100	101	102	103	104	113
Ptilodactylidae																					
CRUSTACEA																					
Astacidae		X	X	X	X		X	X						X	X	X	X		X		X
Isopoda														X					X		
Amphipoda		X																			
Palaemonidae																X		X			X
OLIGOCHAETA						X									X		X		X		
Glossosophoniidae																					
Naididae																					
Tubificidae				X																	
Lumbriculidae																					
HIRUDINEA																					X
HYDRACARINA			X																		
MOLLUSCA																					
Bivalvia																					X
Gastropoda undet. sp.						X															
Unionidae							X			X											
Corbiculidae		X			X		X	X	X	X	X	X			X	X	X	X			
Lymnaeidae																					
Sphaeriidae								X													
Physidae								X													
Viviparidae					X					X	X										
Planorbidae										X	X	X									
Pleuroceridae									X		X	X				X	X				X
Ancylidae														X							
TAXA RICHNESS	23	28	23	23	25	19	27	18	26	17	32	22	21	30	23	21	20	15	22	12	26
EPT INDEX	8	8	11	5	9	7	11	4	10	8	10	10	11	12	8	6	6	6	8	6	10
HABITAT SCORE	52	107	66	45	72	30	68	N/A	104	59	99	103	40	69	72	49	48	49	89	70	104

Macroinvertebrate
Raw Data

ORGANISMS	114	121	122	123	127	130	131	132	133	135	136	138	143	144	145	147	148	149	151	154	155
DIPTERA																					
Tabanidae																				X	
Empididae																					
Tipulidae	X				X	X	X	X			X				X				X	X	X
Tanyderidae																					
Rhagionidae																					
Culicidae																	X				X
Ptychopteridae																					
Dixidae				X													X			X	X
Ceratopogonidae		X								X			X				X			X	X
Chironomidae	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Blephariceridae		X																			
Simuliidae	X			X	X			X					X		X					X	X
TRICHOPTERA																					
Hydroptilidae																					
Helicopsychidae																					
Hydropsychidae		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rhyacophilidae		X									X										
Limnephilidae	X				X			X			X	X					X	X	X		X
Phryganeidae																					
Polycentropidae							X			X										X	X
Psychomiidae	X											X									
Philopotamidae		X		X	X						X	X	X				X			X	X
Dipseuopsidae															X						
Brachycentridae		X										X		X	X	X					
Goeridae																					
Lepidostomatidae					X						X	X									
Calamoceratidae																					
Uenoidae																					
Molannidae																					
Odontoceridae											X										
Leptoceridae			X	X	X		X	X	X	X		X	X	X	X	X	X		X	X	X
Glossosomatidae		X			X																
PLECOPTERA																					
Perlidae	X	X		X	X		X	X	X		X	X	X	X	X	X	X				
Perlodidae		X																			
Peltoperlidae		X			X			X			X	X									
Capniidae	X																				
Leuctridae		X	X		X						X						X				
Nemouridae		X																			
Pteronarcyidae		X											X	X	X	X	X				

Macroinvertebrate
Raw Data

ORGANISMS	114	121	122	123	127	130	131	132	133	135	136	138	143	144	145	147	148	149	151	154	155
Ptilodactylidae					X																
CRUSTACEA																					
Astacidae		X	X	X	X		X	X	X			X	X	X	X	X	X	X	X		
Isopoda										X											X
Amphipoda				X																	X
Palaemonidae																					
OLIGOCHAETA			X		X																X
Glossosophoniidae																					
Naididae																				X	
Tubificidae																					
Lumbriculidae																				X	
HIRUDINEA																					
HYDRACARINA										X											
MOLLUSCA																					
Bivalvia																					
Gastropoda undet. sp.										X											
Unionidae																					
Corbiculidae	X							X													
Lymnaeidae																					
Sphaeriidae																					
Physidae						X															
Viviparidae																					
Planorbidae						X															
Pleuroceridae					X						X										
Ancylidae																					X
TAXA RICHNESS	14	22	16	21	32	16	22	19	21	22	19	26	22	27	26	19	24	15	18	28	32
EPT INDEX	6	15	5	6	16	1	8	8	7	7	11	16	10	10	11	10	9	6	5	11	11
HABITAT SCORE	78	89	54	86	112	54	62	48	62	97	102	82	93	51	47	48	55	52	51	68	71

Macroinvertebrate
Raw Data

ORGANISMS	162	163	164	166	167	176	177	186	187	189	191	192	193	194	195	196	197	200	205	207	210
DIPTERA																					
Tabanidae					X	X		X						X							
Empididae																				X	
Tipulidae	X	X	X				X	X	X	X	X	X		X	X	X	X				X
Tanyderidae																					
Rhagionidae																					
Culicidae		X		X												X					
Ptychopteridae																					
Dixidae		X														X					
Ceratopogonidae		X		X	X	X	X										X				
Chironomidae	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Blephariceridae										X											
Simuliidae						X		X	X	X		X	X		X	X		X		X	X
TRICHOPTERA																	X				
Hydroptilidae														X	X				X		
Helicopsychidae															X						
Hydropsychidae	X			X		X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
Rhyacophilidae								X	X	X					X						
Limnephilidae	X							X	X		X	X		X	X	X					
Phryganeidae																					
Polycentropidae		X	X		X					X	X	X					X				
Psychomiidae		X		X		X		X	X		X	X		X	X						
Philopotamidae			X	X											X			X			X
Dipseuopsidae												X									
Brachycentridae				X					X	X	X				X						X
Goeridae									X	X											
Lepidostomatidae	X							X	X		X			X							
Calamoceratidae	X																				
Uenoidae								X	X	X	X	X		X							
Molannidae	X			X																	
Odontoceridae	X																				
Leptoceridae		X	X	X	X	X		X	X	X	X			X		X	X	X	X	X	
Glossosomatidae								X	X	X	X	X									
PLECOPTERA																					
Perlidae	X							X	X	X	X	X		X	X	X	X	X			X
Perlodidae								X													
Peltoperlidae	X							X	X	X	X	X		X	X						X
Capniidae																					
Leuctridae				X				X	X	X	X	X	X	X	X	X		X			
Nemouridae																					
Pteronarcyidae								X	X	X	X	X		X	X			X			

Macroinvertebrate
Raw Data

[illegible]

Macroinvertebrate
Raw Data

ORGANISMS	162	163	164	166	167	176	177	186	187	189	191	192	193	194	195	196	197	200	205	207	210
Ptilodactylidae				X									X						X		
CRUSTACEA																					
Astacidae	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
Isopoda			X	X			X														
Amphipoda		X			X	X	X														
Palaemonidae																					
OLIGOCHAETA		X			X	X	X														
Glossosophoniidae															X						
Naididae																					
Tubificidae																					
Lumbriculidae																					
HIRUDINEA																					
HYDRACARINA		X			X																
MOLLUSCA																					
Bivalvia			X		X	X															
Gastropoda undet. sp.		X		X															X	X	
Unionidae																					
Corbiculidae		X																X			X
Lymnaeidae																					
Sphaeriidae																					
Physidae																					
Viviparidae																					
Planorbidae																					
Pleuroceridae								X	X	X	X	X	X								
Ancylidae						X			X	X				X	X	X					
TAXA RICHNESS	16	27	22	27	23	24	14	25	36	35	32	29	13	31	30	20	16	24	17	19	18
EPT INDEX	9	7	7	11	7	6	1	16	20	19	20	17	7	17	18	8	6	11	5	6	9
HABITAT SCORE	95	102	98	104	99	99	96	123	91	87	92	91	60	82	110	58	52	58	63	N/A	103

Macroinvertebrate
Raw Data

[illegible]

Macroinvertebrate
Raw Data

[illegible]

Macroinvertebrate
Raw Data

ORGANISMS	211	213	214	216	221	222	224	231	232	236	237	238	155a
Ptilodactylidae		X	X										
CRUSTACEA													
Astacidae	X	X	X			X	X	X	X	X	X	X	
Isopoda													
Amphipoda													
Palaemonidae								X		X	X		
OLIGOCHAETA													
Glossosophoniidae													
Naididae													
Tubificidae													
Lumbriculidae													X
HIRUDINEA		X											
HYDRACARINA													
MOLLUSCA													
Bivalvia													
Gastropoda undet. sp.													
Unionidae										X	X		
Corbiculidae	X					X	X	X		X	X		
Lymnaeidae				X									
Sphaeriidae													
Physidae													
Viviparidae										X	X		
Planorbidae													
Pleuroceridae													
Ancylidae													
TAXA RICHNESS	19	24	15	21	21	18	24	24	21	19	21	16	20
EPT INDEX	7	12	7	9	12	8	11	11	11	8	9	7	8
HABITAT SCORE	N/A	57	74	46	67	66	N/A	92	95	73	88	N/A	71

Common Name	193	196	121	191	186	192	194	61	195	187
American Eel										
Pirate Perch										
Creek Chubsucker										
Northern hogsucker										1
Spotted Sucker										
Striped jumprock										
Silver redhorse										
Flier										
Blue spotted sunfish										
Redbreast Sunfish						2				
Green Sunfish										
Wamouth								1		
Bluegill										
Pumpkinseed										
Longear sunfish										
Redear sunfish										
spotted sunfish										
Redeye Bass										
largemouth Bass					1					
Black Crappie										
Mottled Sculpin			10		2					25
Whitefin Shiner										
Silvery Minnow										
Rosyface Chub										1
Bluehead Chub		1			4		1			1
Golden Shiner										
Highfin Shiner						1				
Spottail Shiner										
Yellowfin Shiner	73	21		7	16	11	18		18	14
Sandbar Shiner										
Creek Chub		22			1	2		6	3	3
Chain Pickerel										
Redfin Pickerel										
Yellow Bullhead										
Brown Bullhead										
Black Bullhead										
Snail Bullhead										
Margined Madtom										
Tadpole Madtom										
Speckled Madtom										
Flat Bullhead										
Savannah Darter										
Christmas darter										
turquoise darter				1						
Tessellated Darter				1					1	1
Blackbanded darter										4
Yellow perch							3		2	
Mosquitofish										
Rainbow trout			7							1
Total	73	44	17	9	24	16	22	7	24	51
Stream Order	1	1	2	2	2	2	2	2	3	3
Number of Species	1	3	2	3	5	4	3	2	4	9
Ecoregion	BR	BR	BR	BR	BR	BR	BR	BR	BR	BR

Common Name	189	162	13	197	15	33	207	72	213	214
American Eel										
Pirate Perch		2				1				
Creek Chubsucker			1							
Northern hogsucker	1		4				9			
Spotted Sucker										
Striped jumprock										3
Silver redhorse										
Flier										
Blue spotted sunfish										
Redbreast Sunfish	2		3	9			3			2
Green Sunfish				21		1				
Wamouth							2			
Bluegill				5	9		5			
Pumpkinseed										
Longear sunfish										
Redear sunfish										
spotted sunfish										
Redeye Bass										
largemouth Bass	1				3					
Black Crappie										
Mottled Sculpin	6									
Whitefin Shiner	3		33							
Silvery Minnow										
Rosyface Chub			6				1			
Bluehead Chub			25	15	47	11	35	15	3	
Golden Shiner										
Highfin Shiner										
Spottail Shiner										2
Yellowfin Shiner	9		181		101	19	90	60	62	70
Sandbar Shiner										
Creek Chub	3	31	8	1	35	43	8	26	39	9
Chain Pickerel										
Redfin Pickerel										
Yellow Bullhead					1					
Brown Bullhead										
Black Bullhead										
Snail Bullhead										
Margined Madtom			6							
Tadpole Madtom										
Speckled Madtom	3									
Flat Bullhead										
Savannah Darter										
Christmas darter										
turquoise darter	2		1							
Tessellated Darter										
Blackbanded darter	1									
Yellow perch			4							
Mosquitofish										
Rainbow trout										
Total	31	33	272	51	196	75	153	101	104	86
Stream Order	3	1	1	1	1	1	1	1	1	1
Number of Species	10	2	11	5	6	5	8	3	3	5
Ecoregion	BR	LP	LP	LP	LP	LP	LP	LP	LP	LP

Common Name	103	85	83	130	148	78	69	71	104	98
American Eel										
Pirate Perch	1				1					2
Creek Chubsucker									2	
Northern hogsucker	1									
Spotted Sucker										
Striped jumprock										
Silver redhorse										
Flier										
Blue spotted sunfish										
Redbreast Sunfish	7	6		10		6			3	
Green Sunfish		2		4		5				
Wamouth		2								
Bluegill		3		8				9	1	1
Pumpkinseed										
Longear sunfish										
Redear sunfish				1		1				
spotted sunfish										
Redeye Bass										
largemouth Bass				1				3		
Black Crappie										
Mottled Sculpin										
Whitefin Shiner				1						
Silvery Minnow										
Rosyface Chub	23	2				1				3
Bluehead Chub	81	14	24		35	19	8	1	9	41
Golden Shiner										1
Highfin Shiner										
Spottail Shiner										
Yellowfin Shiner	112	19	10		31	66	18	17	29	72
Sandbar Shiner										
Creek Chub	17	10	15		8	19	23	125	20	20
Chain Pickerel										
Redfin Pickerel										
Yellow Bullhead		1		1		2				
Brown Bullhead								1		
Black Bullhead										
Snail Bullhead		1								
Margined Madtom	1									
Tadpole Madtom										
Speckled Madtom										
Flat Bullhead										
Savannah Darter										
Christmas darter	1								4	
turquoise darter										
Tessellated Darter	9				1				1	
Blackbanded darter		2								
Yellow perch										
Mosquitofish										
Rainbow trout										
Total	253	62	49	26	76	119	49	156	69	140
Stream Order	1	1	1	1	1	1	1	1	1	1
Number of Species	10	11	3	7	5	8	3	6	8	7
Ecoregion	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP

Common Name	77	68	65	64	29	9	22	28	41	74
American Eel										
Pirate Perch					4					
Creek Chubsucker					3		2	1	3	
Northern hogsucker		7			3	2	2			18
Spotted Sucker										
Striped jumprock		5								3
Silver redhorse										
Flier										
Blue spotted sunfish										
Redbreast Sunfish	3			1	28		3	10	38	10
Green Sunfish					2		21		1	3
Wamouth								1	6	
Bluegill					6	1		13	3	2
Pumpkinseed					7			2	4	
Longear sunfish										
Redear sunfish										
spotted sunfish										
Redeye Bass		2								2
largemouth Bass					3				2	1
Black Crappie										
Mottled Sculpin										
Whitefin Shiner										
Silvery Minnow										
Rosyface Chub		14			5	1	2		12	5
Bluehead Chub	35	35	16	27	61	1	19	6	34	34
Golden Shiner							1		7	
Highfin Shiner					18			12		
Spottail Shiner										
Yellowfin Shiner	99	22	9	43	46	5	18		54	66
Sandbar Shiner										
Creek Chub	34	1	25	36	3	2	18	7		8
Chain Pickerel								2		
Redfin Pickerel										
Yellow Bullhead					4	1	1	1	2	
Brown Bullhead										
Black Bullhead										
Snail Bullhead										
Margined Madtom					1					1
Tadpole Madtom										
Speckled Madtom										1
Flat Bullhead										
Savannah Darter										
Christmas darter					7			2	2	
turquoise darter										
Tessellated Darter					4				1	
Blackbanded darter		5					1		2	3
Yellow perch		1								
Mosquitofish					1		1		9	
Rainbow trout										
Total	171	92	50	107	206	13	89	57	180	157
Stream Order	1	2	2	2	2	2	2	2	2	2
Number of Species	4	9	3	4	18	7	12	11	16	14
Ecoregion	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP

Common Name	87	75	89	96	222	155	154	151	99	131
American Eel									2	
Pirate Perch			4		1					
Creek Chubsucker			1			1				
Northern hogsucker		18		2		3	1	5	6	1
Spotted Sucker							2			
Striped jumprock		4								
Silver redhorse		1								
Flier										
Blue spotted sunfish										
Redbreast Sunfish	12	9	1			28	7	9	17	3
Green Sunfish		4	8	10		4	7			1
Wamouth	1				1	5	3			1
Bluegill	6		9			21	7			10
Pumpkinseed										
Longear sunfish										
Redear sunfish										5
spotted sunfish										
Redeye Bass		2								2
largemouth Bass					1	1	2		1	
Black Crappie										
Mottled Sculpin										
Whitefin Shiner					2					1
Silvery Minnow										
Rosyface Chub			7			4	1		21	
Bluehead Chub	2	64	13	88		8	18	35	14	10
Golden Shiner										
Highfin Shiner										
Spottail Shiner						4	4	29	11	3
Yellowfin Shiner		67	47	117	18	16	9	157	4	2
Sandbar Shiner										
Creek Chub	1	19	5	16	14			20		2
Chain Pickerel										
Redfin Pickerel										
Yellow Bullhead							1	1	1	2
Brown Bullhead										2
Black Bullhead										
Snail Bullhead			1							
Margined Madtom			3		4					2
Tadpole Madtom									1	
Speckled Madtom										
Flat Bullhead									1	
Savannah Darter										
Christmas darter			3	4						
turquoise darter										
Tessellated Darter	1			7		2	1		5	
Blackbanded darter		4						2	10	
Yellow perch										
Mosquitofish					7					
Rainbow trout										
Total	23	192	102	244	48	97	63	258	94	47
Stream Order	2	2	2	2	2	2	2	2	2	2
Number of Species	6	10	12	7	8	12	13	8	13	15
Ecoregion	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP

Common Name	123	221	135	200	132	149	122	216	205	81
American Eel										
Pirate Perch		1								
Creek Chubsucker			5							
Northern hogsucker		2		2					1	7
Spotted Sucker										
Striped jumprock										
Silver redhorse										
Flier										
Blue spotted sunfish										
Redbreast Sunfish	6	1	15	2	6					3
Green Sunfish	3		2			1			1	7
Wamouth										
Bluegill	35			3	1				1	6
Pumpkinseed										
Longear sunfish										
Redear sunfish					1					
spotted sunfish										
Redeye Bass										
largemouth Bass	1								1	1
Black Crappie										
Mottled Sculpin										
Whitefin Shiner		1			1					
Silvery Minnow										3
Rosyface Chub	5		6						5	
Bluehead Chub	24		1		25	72	12		62	68
Golden Shiner			28							
Highfin Shiner										
Spottail Shiner					1					1
Yellowfin Shiner	60	51	31	8	2	42		11	82	53
Sandbar Shiner										
Creek Chub	6	22	5	13	3	19	1	3	1	6
Chain Pickerel										
Redfin Pickerel										
Yellow Bullhead			2							3
Brown Bullhead										
Black Bullhead		1								
Snail Bullhead										4
Margined Madtom					2					2
Tadpole Madtom										
Speckled Madtom										
Flat Bullhead										
Savannah Darter										
Christmas darter			7							
turquoise darter			1							
Tessellated Darter									1	1
Blackbanded darter				1						4
Yellow perch										
Mosquitofish			24							
Rainbow trout										
Total	140	79	127	29	42	134	13	14	155	169
Stream Order	2	2	2	2	2	2	2	2	2	3
Number of Species	8	7	12	6	9	4	2	2	9	15
Ecoregion	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP

Common Name	224	82	86	102	101	94	143	144	88	147
American Eel										
Pirate Perch	1	1		1	1					
Creek Chubsucker										
Northern hogsucker	5	5	12	1	5	25	9		3	2
Spotted Sucker	4						2			
Striped jumprock		2				7			1	
Silver redhorse						2				
Flier								1		
Blue spotted sunfish										
Redbreast Sunfish	4	9	6	9	7	15		2	42	8
Green Sunfish		7	14		3	5			13	
Wamouth	1				1			3	1	1
Bluegill	9			6		1			1	1
Pumpkinseed										
Longear sunfish										
Redear sunfish	4							1		
spotted sunfish										
Redeye Bass	1					2				
largemouth Bass	1									
Black Crappie	1			1						
Mottled Sculpin										
Whitefin Shiner										
Silvery Minnow					3					
Rosyface Chub	10	6		3	6	23				
Bluehead Chub	14	54	88		38	53	24	12	34	33
Golden Shiner	1									
Highfin Shiner										
Spottail Shiner	6		5			9			22	
Yellowfin Shiner	16	66	98	12	46	51	28	10	34	26
Sandbar Shiner										
Creek Chub				1	4		2			
Chain Pickerel										1
Redfin Pickerel										
Yellow Bullhead								2		3
Brown Bullhead										
Black Bullhead										
Snail Bullhead		1				2			1	
Margined Madtom	1	12	5			2	4	1	1	3
Tadpole Madtom										
Speckled Madtom										1
Flat Bullhead			1		2				2	
Savannah Darter										
Christmas darter		6	6			3				
turquoise darter						2				
Tessellated Darter			3	3	9				3	
Blackbanded darter	3	6	14	3	10	30	4		5	8
Yellow perch	1			2						
Mosquitofish				1						
Rainbow trout										
Total	83	175	252	43	135	232	73	32	163	87
Stream Order	3	3	3	3	3	3	3	3	3	3
Number of Species	18	12	11	12	13	16	7	8	14	11
Ecoregion	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP

Common Name	79	100	93	95	80	155A	39	38	211	210
American Eel										
Pirate Perch		1		3		1				
Creek Chubsucker										
Northern hogsucker	5	6	25	7	9	1			1	2
Spotted Sucker										
Striped jumprock			5	2					2	3
Silver redhorse			5	1						
Flier										
Blue spotted sunfish										
Redbreast Sunfish	8	8	5	16	1	16	17	11	9	3
Green Sunfish	12		1		7	3	7	4	3	1
Wamouth			1			3	2			
Bluegill	11		1		4	11	3	2	1	
Pumpkinseed	2									
Longear sunfish										
Redear sunfish										
spotted sunfish										
Redeye Bass			3	2			1		1	2
largemouth Bass			4							
Black Crappie										
Mottled Sculpin										
Whitefin Shiner								2		
Silvery Minnow		1								
Rosyface Chub		10	6	9			4	2	2	2
Bluehead Chub	89	11	47	11	76	7	20	3	18	42
Golden Shiner			1							
Highfin Shiner										
Spottail Shiner	4				35	6	2			
Yellowfin Shiner	78	19	94	13	73	4	5	3	11	9
Sandbar Shiner				3			3			
Creek Chub	19				12	1		5		
Chain Pickerel							11			
Redfin Pickerel										
Yellow Bullhead				1	1	7				
Brown Bullhead										
Black Bullhead										
Snail Bullhead										
Margined Madtom	1		6	1	5		2	1	2	1
Tadpole Madtom										
Speckled Madtom	1									
Flat Bullhead	2	1								
Savannah Darter		6								
Christmas darter				2						
turquoise darter			16						2	4
Tessellated Darter		6	9	1		1	2	1		
Blackbanded darter	4	8	17	5	4		20	1		
Yellow perch									2	5
Mosquitofish										
Rainbow trout										
Total	236	71	258	78	227	61	99	35	54	74
Stream Order	3	3	3	3	3	3	3	3	3	3
Number of Species	13	10	19	16	11	12	14	11	12	11
Ecoregion	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP

Common Name	133	37	34	32	12	27	19	14	10	11
American Eel										
Pirate Perch			2	1		1				3
Creek Chubsucker			9	1				1		2
Northern hogsucker	1	5	7	1	7		1	2	11	
Spotted Sucker			2							
Striped jumprock				3	2			1		
Silver redhorse					1					
Flier										
Blue spotted sunfish										
Redbreast Sunfish	11	7	21	6	5	5	5	5	2	7
Green Sunfish	2	4	13	2	4		21		13	1
Wamouth	1		2					2		5
Bluegill	7		5		1		1	1		
Pumpkinseed										
Longear sunfish										
Redear sunfish										
spotted sunfish										
Redeye Bass										
largemouth Bass	1				1					
Black Crappie										
Mottled Sculpin										
Whitefin Shiner					2				2	
Silvery Minnow										
Rosyface Chub		13	4	16	1	8	1	5		1
Bluehead Chub	3	41	60	50	88	5	18	27	72	13
Golden Shiner					1		2			
Highfin Shiner		2	20	1						2
Spottail Shiner								3	1	
Yellowfin Shiner		43	66	66	31	13	11	23	50	17
Sandbar Shiner										
Creek Chub		2	3		14		4	1	11	4
Chain Pickerel										
Redfin Pickerel										
Yellow Bullhead					3		1	1		
Brown Bullhead	1	2			1					
Black Bullhead										
Snail Bullhead			1	1		1		3		
Margined Madtom	1	6	2	3				3		
Tadpole Madtom										
Speckled Madtom										
Flat Bullhead										
Savannah Darter										
Christmas darter		7	6	5						2
turquoise darter										
Tessellated Darter		1	3	9			1			
Blackbanded darter		3	2	3			3		3	
Yellow perch								5		
Mosquitofish						3		1		1
Rainbow trout										
Total	28	136	228	168	162	36	69	84	165	58
Stream Order	3	3	3	3	3	3	3	3	3	3
Number of Species	9	13	18	15	15	7	12	16	9	12
Ecoregion	LP	LP	LP	LP	LP	LP	LP	LP	LP	LP

Common Name	8	145	30	176	113	232	231	127	136	138
American Eel										
Pirate Perch			3	1						
Creek Chubsucker										
Northern hogsucker	4	3	2							2
Spotted Sucker										
Striped jumprock										
Silver redhorse										
Flier										
Blue spotted sunfish						1				
Redbreast Sunfish	9	5	10		1			1		1
Green Sunfish	14		1							
Wamouth		1	1		3	1				
Bluegill		3	5		6					
Pumpkinseed					4					
Longear sunfish										
Redear sunfish										
spotted sunfish										
Redeye Bass										
largemouth Bass										
Black Crappie										
Mottled Sculpin									6	3
Whitefin Shiner	2									
Silvery Minnow	1									
Rosyface Chub	2		3							
Bluehead Chub	47	21	23					27		7
Golden Shiner										
Highfin Shiner			1							
Spottail Shiner	1									3
Yellowfin Shiner	26	6	16		6	8	11	119	13	10
Sandbar Shiner										
Creek Chub	2	2	2					35	34	5
Chain Pickerel		2								
Redfin Pickerel										
Yellow Bullhead										
Brown Bullhead	2									
Black Bullhead										
Snail Bullhead			2							
Margined Madtom			1			1				1
Tadpole Madtom										
Speckled Madtom		1					1			
Flat Bullhead										
Savannah Darter					3		2			
Christmas darter			4							
turquoise darter										
Tessellated Darter			9							
Blackbanded darter		2								
Yellow perch										
Mosquitofish				8						
Rainbow trout										
Total	110	46	83	9	23	11	14	182	53	32
Stream Order	3	3		2	2	3	3	1	1	2
Number of Species	11	10	15	2	6	4	3	4	3	8
Ecoregion	LP	LP	LP	MACP	SH	SH	SH	UP	UP	UP

Common Name	238	51	163	166	236	237	164	167	Total
American Eel	1								2
Pirate Perch	5	2	2	2	1	1	5	3	45
Creek Chubsucker			4	1					33
Northern hogsucker									237
Spotted Sucker									10
Striped jumprock									29
Silver redhorse									10
Flier		1							1
Blue spotted sunfish							1		1
Redbreast Sunfish		3	1	2		1	16	13	533
Green Sunfish							1		250
Wamouth		4	1				2	1	44
Bluegill			1					6	194
Pumpkinseed		2							19
Longear sunfish							3	8	11
Redear sunfish									12
spotted sunfish		2	5	11			3	3	22
Redeye Bass									15
largemouth Bass		1						2	29
Black Crappie									2
Mottled Sculpin									42
Whitefin Shiner									16
Silvery Minnow									8
Rosyface Chub									225
Bluehead Chub		1	2	20			10		2098
Golden Shiner									42
Highfin Shiner									54
Spottail Shiner									147
Yellowfin Shiner	2	2	38	15	4	6	42		2866
Sandbar Shiner	2								6
Creek Chub	11			3		3			816
Chain Pickerel			2	3			2	2	25
Redfin Pickerel	1				1				0
Yellow Bullhead		2							40
Brown Bullhead									8
Black Bullhead									1
Snail Bullhead									15
Margined Madtom	1					1	1		75
Tadpole Madtom									1
Speckled Madtom	2					2			7
Flat Bullhead									11
Savannah Darter	2								61
Christmas darter									40
turquoise darter									43
Tessellated Darter	3		1	1			11	1	70
Blackbanded darter			2				4		198
Yellow perch	1				1				3
Mosquitofish									46
Rainbow trout									1
Total	31	20	59	58	7	14	101	39	
Stream Order	1	1	2	2	2	2	2	3	
Number of Species	11	10	11	9	4	6	13	9	
Ecoregion	US/SP	US/SP	US/SP	US/SP	US/SP	US/SP	US/SP	US/SP	

Savannah River REMAP IBI Final Results

	1		2		3		4		5		6		7		8		9		
	Benthic Invertivores		Brillouin Diversity Index		Non-native species		Number of native suckers		Number of native sunfishes		Number of minnows species		Number of species		Number of darter species		Proportion of omnivores		
Stream Station	Metric Result	IBI Score	Metric Result	IBI Score	Metric Result	IBI Score	Metric Result	IBI Score	Metric Result	IBI Score	Metric Result	IBI Score	Metric Result	IBI Score	Metric Result	IBI Score	Metric Result	IBI Score	Total IBI Score
13	2.21	1	0.51	3	1.47	5	2.00		1.00	1	5.00	5	11.00	5	1.00	3	12.13	5	33
15	0.00	1	0.51	3	0.00	5	0.00	3	1.00	1	3.00	3	6.00	3	0.00	1	41.84	3	23
33	0.00	1	0.43	3	1.33	5	0.00	3	1.00	1	3.00	3	5.00	3	0.00	1	72.00	1	21
69	0.00	1	0.41	3	0.00	5	0.00	3	0.00	1	3.00	3	3.00	1	0.00	1	63.27	1	19
71	0.00	1	0.29	1	0.00	5	0.00	3	1.00	1	3.00	3	6.00	3	0.00	1	80.77	1	19
72	0.00	1	0.39	3	0.00	5	0.00	3	0.00	1	3.00	3	3.00	1	0.00	1	40.59	3	21
77	0.00	1	0.43	3	0.00	5	0.00	3	1.00	1	3.00	3	4.00	1	0.00	1	40.35	3	21
78	0.00	1	0.54	5	4.20	5	0.00	3	3.00	3	4.00	3	8.00	5	0.00	1	31.93	3	29
83	0.00	1	0.41	3	0.00	5	0.00	3	0.00	1	3.00	3	3.00	1	0.00	1	79.59	1	19
85	3.23	3	0.74	5	3.23	5	0.00	3	4.00	3	4.00	3	11.00	5	1.00	3	38.71	3	33
98	0.00	1	0.49	3	0.00	5	0.00	3	1.00	1	5.00	5	7.00	3	0.00	1	44.29	3	25
103	4.35	3	0.59	5	0.00	5	1.00	5	1.00	1	4.00	3	10.00	5	2.00	5	38.74	3	35
104	10.14	5	0.59	5	0.00	5	1.00	5	2.00	1	3.00	3	8.00	5	2.00	5	42.03	3	37
130	0.00	1	0.54	5	15.38	3	0.00	3	4.00	3	1.00	1	7.00	3	0.00	1	0.00	5	25
148	1.32	1	0.43	3	0.00	5	0.00	3	0.00	1	3.00	3	5.00	3	1.00	3	56.58	3	25
162	0.00	1	0.08	1	0.00	5	0.00	3	0.00	1	1.00	1	2.00	1	0.00	1	93.94	1	15
197	0.00	1	0.52	5	41.18	1	0.00	3	3.00	3	2.00	1	5.00	3	0.00	1	31.37	3	21
207	5.88	3	0.51	3	0.00	5	1.00	5	3.00	3	4.00	3	8.00	5	0.00	1	28.10	5	33
213	0.00	1	0.32	3	0.00	5	0.00	3	0.00	1	3.00	3	3.00	1	0.00	1	40.38	3	21
214	3.49	3	0.27	1	0.00	5	1.00	5	1.00	1	3.00	3	5.00	3	0.00	1	12.79	5	27
9	15.38	5	0.00	1	0.00	5	1.00	1	1.00	1	4.00	3	7.00	3	0.00	1	23.08	5	25
22	5.62	1	0.74	5	23.60	1	2.00	3	2.00	1	5.00	5	12.00	3	1.00	1	42.70	3	23
28	5.26	1	0.77	5	3.51	5	1.00	1	4.00	3	3.00	3	11.00	3	1.00	1	22.81	5	27
29	8.25	3	0.88	5	4.37	5	2.00	3	4.00	3	5.00	5	18.00	5	2.00	3	31.07	5	37
41	4.44	1	0.83	5	2.78	5	1.00	1	5.00	5	4.00	3	16.00	5	3.00	5	22.78	5	35
64	0.00	1	0.46	3	0.00	5	0.00	1	1.00	1	3.00	3	4.00	1	0.00	1	58.88	3	19
65	0.00	1	0.41	3	0.00	5	0.00	1	0.00	1	3.00	3	3.00	1	0.00	1	82.00	1	17
68	18.48	5	0.67	5	1.09	5	2.00	3	0.00	1	4.00	3	9.00	3	1.00	1	39.13	5	31
74	15.29	5	0.73	5	1.91	5	2.00	3	3.00	3	4.00	3	14.00	5	1.00	1	26.75	5	35
75	14.06	5	0.68	5	2.08	5	3.00	5	2.00	1	3.00	3	10.00	3	1.00	1	43.23	3	31
87	4.35	1	0.46	3	0.00	5	0.00	1	3.00	3	2.00	1	6.00	1	1.00	1	13.04	5	21
89	3.92	1	0.72	5	7.84	5	1.00	1	3.00	3	4.00	3	12.00	3	1.00	1	17.65	5	27
96	5.33	1	0.52	3	4.10	5	1.00	1	1.00	1	3.00	3	7.00	3	2.00	3	42.62	3	23
99	22.34	5	0.85	5	0.00	5	1.00	1	1.00	1	4.00	3	13.00	3	2.00	3	29.79	5	31
122	0.00	1	0.09	1	0.00	5	1.00	1	0.00	1	2.00	1	2.00	1	0.00	1	100.00	1	13
123	0.00	1	0.62	5	2.14	5	1.00	1	3.00	3	4.00	3	8.00	3	0.00	1	21.43	5	27
131	2.13	1	0.87	5	2.13	5	1.00	1	5.00	5	5.00	5	15.00	5	0.00	1	31.91	5	33
132	0.00	1	0.52	3	0.00	5	0.00	1	3.00	3	5.00	5	9.00	3	0.00	1	69.05	3	25
135	10.24	3	0.81	5	1.57	5	1.00	1	2.00	1	5.00	5	12.00	3	2.00	3	26.77	5	31
149	0.00	1	0.42	3	0.75	5	0.00	1	1.00	1	3.00	3	4.00	1	0.00	1	67.91	3	19
151	2.71	1	0.53	3	0.00	5	1.00	1	1.00	1	4.00	3	8.00	3	1.00	1	32.56	5	23
154	6.35	1	0.83	5	11.11	3	2.00	3	4.00	3	4.00	3	13.00	3	1.00	1	34.92	5	27
155	6.19	1	0.80	5	4.12	5	2.00	3	4.00	3	4.00	3	12.00	3	1.00	1	12.37	5	29
200	10.34	3	0.52	3	0.00	5	1.00	1	2.00	1	2.00	1	6.00	1	1.00	1	44.83	3	19

Savannah River REMAP IBI Final Results

	1		2		3		4		5		6		7		8		9		
	Benthic Invertivores		Brillouin Diversity Index		Non-native species		Number of native suckers		Number of native sunfishes		Number of minnows species		Number of species		Number of darter species		Proportion of omnivores		
Stream Station	Metric Result	IBI Score	Metric Result	IBI Score	Metric Result	IBI Score	Metric Result	IBI Score	Metric Result	IBI Score	Metric Result	IBI Score	Metric Result	IBI Score	Metric Result	IBI Score	Metric Result	IBI Score	Total IBI Score
205	1.29	1	0.41	3	0.65	5	1.00	1	2.00	1	4.00	3	9.00	3	1.00	1	40.65	5	23
216	0.00	1	0.18	1	0.00	5	0.00	1	0.00	1	2.00	1	2.00	1	0.00	1	21.43	5	17
221	2.53	1	0.37	3	1.27	5	1.00	1	1.00	1	3.00	3	7.00	3	0.00	1	27.85	5	23
222	0.00	1	0.60	5	0.00	5	0.00	1	1.00	1	3.00	3	8.00	3	0.00	1	29.17	5	25
8	3.64	1	0.66	1	12.73	3	1.00	1	2.00	3	7.00	5	11.00	3	0.00	1	45.45	1	19
10	8.48	1	0.61	1	7.88	5	1.00	1	2.00	3	5.00	3	9.00	3	1.00	3	50.91	1	21
11	6.90	1	0.78	3	1.72	5	1.00	1	3.00	3	5.00	3	12.00	3	1.00	3	29.31	3	25
12	6.17	1	0.63	1	2.47	5	3.00	5	3.00	3	6.00	5	15.00	5	0.00	1	63.58	1	27
14	4.76	1	0.80	3	5.95	5	3.00	5	3.00	3	5.00	3	16.00	5	0.00	1	36.90	3	29
19	7.25	1	0.73	3	30.43	1	1.00	1	3.00	3	5.00	3	12.00	3	2.00	3	34.78	3	21
27	0.00	1	0.62	1	0.00	5	0.00	1	1.00	1	3.00	1	7.00	1	0.00	1	13.89	5	17
32	13.10	3	0.71	3	1.19	5	3.00	5	2.00	3	4.00	3	15.00	5	3.00	5	29.76	3	35
34	12.72	3	0.87	5	5.70	5	3.00	5	4.00	5	5.00	3	18.00	5	3.00	5	27.63	3	39
37	11.76	1	0.77	3	2.94	5	1.00	1	2.00	3	5.00	3	13.00	3	3.00	5	31.62	3	27
38	5.71	1	0.76	3	11.43	3	0.00	1	3.00	3	5.00	3	11.00	3	2.00	3	22.86	3	23
39	22.22	3	0.88	5	7.07	5	0.00	1	4.00	5	5.00	3	14.00	3	2.00	3	22.22	3	31
79	3.81	1	0.70	1	5.93	5	1.00	1	4.00	5	4.00	3	13.00	3	1.00	3	48.31	1	23
80	5.73	1	0.70	1	3.08	5	1.00	1	3.00	3	4.00	3	11.00	3	1.00	3	54.19	1	21
81	7.10	1	0.71	3	4.14	5	1.00	1	3.00	3	5.00	3	15.00	5	2.00	3	44.38	1	25
82	10.86	1	0.71	3	4.00	5	2.00	3	2.00	3	3.00	1	12.00	3	2.00	3	30.86	3	25
86	13.89	3	0.67	1	5.56	5	1.00	1	2.00	3	3.00	1	11.00	3	3.00	5	37.30	3	25
88	7.36	1	0.79	3	7.98	5	2.00	3	4.00	5	3.00	1	14.00	3	2.00	3	35.58	3	27
93	34.11	5	0.88	5	0.39	5	3.00	5	4.00	5	4.00	3	19.00	5	4.00	5	18.99	5	43
94	29.74	5	0.90	5	2.16	5	3.00	5	3.00	3	4.00	3	16.00	5	3.00	5	26.72	3	39
95	23.08	5	0.90	5	0.00	5	3.00	5	1.00	1	4.00	3	16.00	5	3.00	5	15.38	5	39
100	28.17	5	0.79	3	0.00	5	1.00	1	1.00	1	4.00	3	10.00	3	2.00	3	16.90	5	29
101	17.78	3	0.77	3	2.22	5	1.00	1	3.00	3	5.00	3	13.00	3	2.00	3	32.59	3	27
102	16.28	3	0.77	3	4.65	5	1.00	1	2.00	3	3.00	1	12.00	3	2.00	3	2.33	5	27
133	3.57	1	0.61	1	7.14	5	1.00	1	4.00	5	1.00	1	9.00	3	0.00	1	10.71	5	23
143	20.55	3	0.60	1	0.00	5	2.00	3	0.00	1	3.00	1	7.00	1	1.00	3	35.62	3	21
144	0.00	1	0.59	1	0.00	5	0.00	1	4.00	5	2.00	1	8.00	1	0.00	1	37.50	3	19
145	10.87	1	0.67	1	0.00	5	1.00	1	3.00	3	3.00	1	10.00	3	1.00	3	50.00	1	19
147	11.49	1	0.66	1	0.00	5	1.00	1	3.00	3	2.00	1	11.00	3	1.00	3	37.93	3	21
155.1	3.28	1	0.81	3	4.92	5	1.00	1	4.00	5	4.00	3	12.00	3	1.00	3	22.95	3	27
210	12.16	3	0.61	1	8.11	5	2.00	3	2.00	3	3.00	1	11.00	3	1.00	3	56.76	1	23
211	9.26	1	0.74	3	9.26	5	2.00	3	3.00	3	3.00	1	12.00	3	1.00	3	33.33	3	25
224	14.46	3	0.94	5	1.20	5	2.00	3	4.00	5	5.00	3	18.00	5	1.00	3	25.30	3	35
30	18.07	3	0.85	5	1.20	5	1.00	1	4.00	5	5.00	3	15.00	5	2.00	3	30.12	3	33

Summary of Biological Indicator Scores and Results of the Lower Piedmont Ecological Index (LPEI)

Station	Station	Order	Macroinvertebrate				FISH		LPEI	
			Habitat		EPT		Fish IBI		Total	Stream
			Result	Score	Index	Score	Result	Score	Index Score	Classification
8	8	3	64	3	3	1	19	1	5	Poor
9	9	2	94	5	4	1	25	3	9	Fair
10	10	3	80	3	4	1	21	1	5	Poor
11	11	3	47	1	3	1	25	3	5	Poor
12	12	3	83	3	5	1	27	3	7	Poor
13	13	1	61	3	3	1	33	5	9	Fair
14	14	3	45	1	3	1	29	3	5	Poor
15	15	1	87	3	2	1	23	3	7	Poor
19	19	3	91	5	5	1	21	1	7	Poor
22	22	2	93	5	5	1	23	3	9	Fair
27	27	3	64	3	3	1	17	1	5	Poor
28	28	2	92	5	2	1	27	3	9	Fair
29	29	2	119	5	7	3	37	5	13	Good
30	30	3	116	5	5	1	33	5	11	FAIR
32	32	3	112	5	5	1	35	5	11	FAIR
33	33	1	75	3	4	1	21	1	5	Poor
34	34	3	113	5	6	3	39	5	13	Good
37	37	3	111	5	7	3	27	3	11	Good
38	38	3	88	5	5	1	23	3	9	Fair
39	39	3	82	3	2	1	31	5	9	Fair
41	41	2	48	1	4	1	35	5	7	Poor
64	64	2	45	1	7	3	19	1	5	Poor
65	65	2	41	1	5	1	17	1	3	Poor
68	68	2	104	5	15	5	31	5	15	Good
69	69	1	84	3	12	5	19	1	9	Fair
71	71	1	76	3	8	3	19	1	7	Poor
72	72	1	82	3	18	5	21	1	9	Fair
74	74	2	41	1	9	5	35	5	11	FAIR
75	75	2	54	3	9	5	31	5	13	Good
77	77	1	105	5	10	5	21	1	11	FAIR
78	78	1	91	5	4	1	29	3	9	Fair
79	79	3	53	3	7	3	23	3	9	Fair
80	80	3	52	1	8	3	21	1	5	Poor
81	81	3	52	1	8	3	25	3	7	Poor
82	82	3	107	5	8	3	25	3	11	Good
83	83	1	66	3	11	5	19	1	9	Fair
85	85	1	45	1	5	1	33	5	7	Poor
86	86	3	72	3	9	5	25	3	11	Good
87	87	2	30	1	7	3	21	1	5	Poor
88	88	3	68	3	11	5	27	3	11	Good
93	93	3	104	5	10	5	43	5	15	Good
94	94	3	59	3	8	3	39	5	11	Good
95	95	3	99	5	10	5	39	5	15	Good
96	96	2	103	5	10	5	23	3	13	Good
98	98	1	69	3	12	5	25	3	11	Good
99	99	2	72	3	8	3	31	5	11	Good
100	100	3	49	1	8	3	29	3	7	Poor
101	101	3	48	1	6	3	27	3	7	Poor
102	102	3	49	1	6	3	27	3	7	Poor
103	103	1	89	5	8	3	35	5	13	Good
104	104	1	70	3	6	3	37	5	11	Good
122	122	2	53	3	5	1	13	1	5	Poor
123	123	2	86	3	6	3	27	3	9	Fair
130	130	1	54	3	1	1	25	3	7	Poor
131	131	2	62	3	8	3	33	5	11	Good

Summary of Biological Indicator Scores and Results of the Lower Piedmont Ecological Index (LPEI)

Station	Station	Order	Macroinvertebrate				FISH		LPEI	
			Habitat		EPT		Fish IBI		Total	
			Result	Score	Index	Score	Result	Score	Index Score	Stream Classification
132	132	2	48	1	8	3	25	3	7	Poor
133	133	3	62	3	7	3	23	3	9	Fair
135	135	2	75	3	7	3	31	5	11	Good
143	143	3	93	5	10	5	21	1	11	FAIR
144	144	3	51	1	10	5	19	1	7	Poor
145	145	3	47	1	11	5	19	1	7	Poor
147	147	3	48	1	10	5	21	1	7	Poor
148	148	1	55	3	9	5	25	3	11	Good
149	149	2	52	1	6	3	19	1	5	Poor
151	151	2	51	1	5	1	23	3	5	Poor
154	154	2	68	3	11	5	27	3	11	Good
155	155	2	71	3	10	5	29	3	11	Good
155.1	155.1	3	72	3	8	3	27	3	9	Fair
162	162	1	95	5	9	5	15	1	11	Good
197	197	1	52	1	6	3	21	1	5	Poor
200	200	2	58	3	11	5	19	1	9	Fair
205	205	2	63	3	5	1	23	3	7	Poor
210	210	3	103	5	9	5	23	3	13	Good
213	213	1	57	3	12	5	21	1	9	Fair
214	214	1	74	3	7	3	27	3	9	Fair
216	216	2	46	1	9	5	17	1	7	Poor
221	221	2	67	3	12	5	23	3	11	Good
222	222	2	66	3	8	3	25	3	9	Fair

Station	Order	Habitat		EPT		IBI		Total Score	Stream Classification
		Index	Score	Index	Score	Index	Score		
4	1	76	3	3	1				
13	1	61	3	3	1	33	5	9	Fair
15	1	87	3	2	1	23	3	7	Poor
33	1	75	3	4	1	21	1	5	Poor
44	1	75	3	3	1		1		
69	1	84	3	12	5	19	1	9	Fair
71	1	76	3	8	3	19	1	7	Poor
72	1	82	3	18	5	21	1	9	Fair
77	1	105	5	10	5	21	1	11	Fair
78	1	91	5	4	1	29	3	9	Fair
83	1	66	3	11	5	19	1	9	Fair
85	1	45	1	5	1	33	5	7	Poor
97	1	40	1	11	5		1		
98	1	69	3	12	5	25	3	11	Fair
103	1	89	5	8	3	35	5	13	Good
104	1	70	3	6	3	37	5	11	Fair
130	1	54	3	1	1	25	3	7	Poor
148	1	55	3	9	5	25	3	11	Fair
162	1	95	5	9	5	15	1	11	Fair
197	1	52	1	6	3	21	1	5	Poor
207	1			6	3	33	5		
213	1	57	3	12	5	21	1	9	Fair
214	1	74	3	7	3	27	3	9	Fair
9	2	94	5	4	1	25	3	9	Fair
22	2	93	5	5	1	23	3	9	Fair
28	2	92	5	2	1	27	3	9	Fair
29	2	119	5	7	3	37	5	13	Good
31	2	87	3				1		
41	2	48	1	4	1	35	5	7	Poor
45	2	45	1	1	1		1		
64	2	45	1	7	3	19	1	5	Poor
65	2	41	1	5	1	17	1	3	Poor
68	2	104	5	15	5	31	5	15	Good
74	2	41	1	9	5	35	5	11	Fair
75	2	54	3	9	5	31	5	13	Good
87	2	30	1	7	3	21	1	5	Poor
89	2			4	1	27	3		
96	2	103	5	10	5	23	3	13	Good
99	2	72	3	8	3	31	5	11	Fair
122	2	53	3	5	1	13	1	5	Poor
123	2	86	3	6	3	27	3	9	Fair
131	2	62	3	8	3	33	5	11	Fair
132	2	48	1	8	3	25	3	7	Poor
135	2	75	3	7	3	31	5	11	Fair
149	2	52	1	6	3	19	1	5	Poor
151	2	51	1	5	1	23	3	5	Poor
154	2	68	3	11	5	27	3	11	Fair
155	2	71	3	10	5	29	3	11	Fair
200	2	58	3	11	5	19	1	9	Fair
205	2	63	3	5	1	23	3	7	Poor
216	2	46	1	9	5	17	1	7	Poor
221	2	67	3	12	5	23	3	11	Fair
222	2	66	3	8	3	25	3	9	Fair
8	3	64	3	3	1	19	1	5	Poor
10	3	80	3	4	1	21	1	5	Poor
11	3	47	1	3	1	25	3	5	Poor
12	3	83	3	5	1	27	3	7	Poor
14	3	45	1	3	1	29	3	5	Poor
19	3	91	5	5	1	21	1	7	Poor
21	3	67	3	5	1		1		

27	3	64	3	3	1	17	1	5	Poor
30	3	116	5	5	1	33	5	11	Fair
32	3	112	5	5	1	35	5	11	Fair
34	3	113	5	6	3	39	5	13	Good
37	3	111	5	7	3	27	3	11	Fair
38	3	88	5	5	1	23	3	9	Fair
39	3	82	3	2	1	31	5	9	Fair
79	3	53	3	7	3	23	3	9	Fair
80	3	52	1	8	3	21	1	5	Poor
81	3	52	1	8	3	25	3	7	Poor
82	3	107	5	8	3	25	3	11	Fair
86	3	72	3	9	5	25	3	11	Fair
88	3	68	3	11	5	27	3	11	Fair
93	3	104	5	10	5	43	5	15	Good
94	3	59	3	8	3	39	5	11	Fair
95	3	99	5	10	5	39	5	15	Good
100	3	49	1	8	3	29	3	7	Poor
101	3	48	1	6	3	27	3	7	Poor
102	3	49	1	6	3	27	3	7	Poor
133	3	62	3	7	3	23	3	9	Fair
143	3	93	5	10	5	21	1	11	Fair
144	3	51	1	10	5	19	1	7	Poor
145	3	47	1	11	5	19	1	7	Poor
147	3	48	1	10	5	21	1	7	Poor
155.1	3	72	3	8	3	27	3	9	Fair
210	3	103	5	9	5	23	3	13	Good
211	3			7	3	25	3		
224	3			11	5	35	5		

	Scores	Percent
Good	9	11.5
Fir	38	48.7
Poor	31	39.7
Total	78	100