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WATER QUALITY ASSESSMENT AND TROPHIC STATUS OF EASTERN KENTUCKY RESERVOIRS

FINAL REPORT

by

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ADDENDUM
For
Water Quality Assessment and Trophic Status of Eastern Kentucky Reservoirs
Final Report
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The attached Appendix C replaces the one that is contained in this report. Please replace Appendix C with this Addendum. If you have any questions, please feel free to contact me.

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APPENDIX C. LAKE DEPTH PROFILES

Lake	Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
				m	oC		ppm	µS		m	m	m
Carnico	Dam	980518	1153	0	24.87	8.58	9.14	243	0.0	2.33		6.0
Carnico	Dam	980518		1	24.22	8.63	9.89	240	3.7			
Carnico	Dam	980518		2	21.07	8.57	10.48	239	3.8			
Carnico	Dam	980518		3	17.68	7.78	7.08	241	5.0			
Carnico	Dam	980518		4	16.26	7.57	5.55	242	4.2			
Carnico	Dam	980518		5	15.67	7.58	5.32	241	4.3			
Carnico	Dam	980518		6	14.12	7.47	4.05	245	48.3		6	
Carnico	Upper	980518		0	25.53	8.48	8.67	237	30.7	1.56		3.0
Carnico	Upper	980518		1	24.93	8.39	8.76	237	2.8			
Carnico	Upper	980518		2	24.53	8.06	7.49	240	17.3			
Carnico	Upper	980518		3	18.35	7.67	6.15	240	0.8		3	
Carnico	Dam	980724	1600	0	28.57	8.99	10.06	182	0.0	0.77		2.3
Carnico	Dam	980724		1	28.37	8.97	10.93	181	15.9			
Carnico	Dam	980724		2	27.38	8.84	9.93	182	14.5			
Carnico	Dam	980724		3	25.33	7.64	3.74	196	7.6			
Carnico	Dam	980724		4	22.26	7.42	0.53	229	7.8			
Carnico	Dam	980724		5	18.36	7.33	0.20	256	11.0			
Carnico	Dam	980724		6	14.45	7.20	0.13	255	11.4			
Carnico	Dam	980724		7	12.50	7.15	0.10	256	14.1			
Carnico	Dam	980724		8	11.49	7.12	0.09	258	18.1		8.3	
Carnico	Upper	980724		0	29.43	8.90	9.24	182	10.5	0.59		2.8
Carnico	Upper	980724		1	27.92	8.89	10.19	182	18.5			
Carnico	Upper	980724		2	27.48	8.12	5.89	186	34.6			
Carnico	Upper	980724		3	25.57	7.48	2.18	199	51.8			
Carnico	Upper	980724		3.3	24.43	7.35	0.87	204	53.1		3.3	
Carnico	Dam	981017	1620	0	18.28	8.07	8.54	193		1.24		4.1
Carnico	Dam	981017		1	18.30	8.04	8.00	193				
Carnico	Dam	981017		2	18.11	7.99	7.66	195				
Carnico	Dam	981017		3	17.86	7.93	7.08	197				
Carnico	Dam	981017		4	17.77	7.89	7.01	197				
Carnico	Dam	981017		5	17.62	7.77	5.68	203				
Carnico	Dam	981017		6	17.41	7.70	4.15	199				
Carnico	Dam	981017		7	14.30	7.42	1.61	271				
Carnico	Dam	981017		8	12.00	7.38	1.48	268				
Carnico	Dam	981017		9	10.57	7.32	1.45	269				
Carnico	Dam	981017		10	10.38	7.31	1.37	281			10	
Carnico	Upper	981017		0	18.88	8.19	9.27	194		1.51		3.2
Carnico	Upper	981017		1	18.90	8.17	9.35	194				
Carnico	Upper	981017		2	18.88	8.16	9.12	192				
Carnico	Upper	981017		2.6	18.86	8.15	9.15	193			2.6	
Carter Ca	Dam	981017	1207	0	18.00	7.54	7.31	256		1.22		3.0
Carter Ca	Dam	981017		1	17.80	7.56	7.50	254				
Carter Ca	Dam	981017		2	16.89	7.57	7.26	253				
Carter Ca	Dam	981017		3	16.87	7.56	7.06	256				
Carter Ca	Dam	981017		4	16.84	7.56	7.00	253				
Carter Ca	Dam	981017		5	16.79	7.53	6.20	250				

Lake	Site	Date	Time	Depth m	Temp oC	pH	D.O. ppm	Cond. µS	FTU	Zsd m	Zmax m	Photic Zone m
Carter Ca	Dam	981017		6	16.25	7.43	3.44	256				
Carter Ca	Dam	981017		7	15.95	7.32	1.65	257			7	
Carter Ca	Upper	981017		0	17.41	7.70	7.76	254		1.02		
Carter Ca	Upper	981017		1	16.77	7.66	7.00	251				
Carter Ca	Upper	981017		2	16.55	7.64	6.23	253			2	
Carter Ca	Dam	980518	1408	0.0	23.34	8.1	8.99	274	0.0	2.16		4.6
Carter Ca	Dam	980518		1.0	20.63	8.25	11.5	258	1.0			
Carter Ca	Dam	980518		2.0	17.12	8.46	12.8	225	2.9			
Carter Ca	Dam	980518		3.0	12.92	8.02	9.42	202	13.1			
Carter Ca	Dam	980518		4.0	11.80	7.68	6.63	213	11.9			
Carter Ca	Dam	980518		5.0	11.32	7.59	5.25	226	9.8			
Carter Ca	Dam	980518		6.0	10.51	7.46	2.55	224	14.0			
Carter Ca	Dam	980518		7.0	9.06	7.42	1.93	234	10.8			
Carter Ca	Dam	980518		8.0	7.81	7.27	0.21	277	10.2		8	
Carter Ca	Upper	980518		0.0	23.67	8.1	8.87	282	10.0	1.69		
Carter Ca	Upper	980518		1.0	22.65	7.77	8.37	287	3.3			
Carter Ca	Upper	980518		2.0	16.05	7.65	6.94	258	10.7		2	
Carter Ca	Dam	980724	950	0	28.04	7.99	7.11	281	0.5	2.70		4.9
Carter Ca	Dam	980724		1	27.73	7.98	7.42	283	0.6			
Carter Ca	Dam	980724		2	27.28	7.59	6.77	285	0.5			
Carter Ca	Dam	980724		3	22.46	7.56	7.75	230	2.3			
Carter Ca	Dam	980724		4	17.30	7.25	2.87	209	1.2			
Carter Ca	Dam	980724		5	14.70	7.08	0.56	216	1.9			
Carter Ca	Dam	980724		6	13.14	7.05	0.22	225	14.3			
Carter Ca	Dam	980724		7	11.53	6.94	0.13	250	8.0			
Carter Ca	Dam	980724		8	9.74	6.9	0.09	315	9.0			
Carter Ca	Dam	980724		8.7	8.85	6.83	0.08	442	12.2		8.7	
Carter Ca	Upper	980724		0	27.88	7.67	6.48	291	2.3	1.80		2.8
Carter Ca	Upper	980724		1	27.61	7.6	6.58	291	3.2			
Carter Ca	Upper	980724		2	27.17	7.4	5.1	295	7.5			
Carter Ca	Upper	980724		2.8	24.90	7.11	0.49	303	55.4		2.8	
Fox Creek	Dam	981017	1420	0	16.92	8.02	9.45	206		0.89		2.0
Fox Creek	Dam	981017		1	16.50	7.82	7.60	209				
Fox Creek	Dam	981017		2	16.40	7.82	8.32	209				
Fox Creek	Dam	981017		3	16.34	7.63	5.50	208				
Fox Creek	Dam	981017		4	15.59	7.18	1.56	281				
Fox Creek	Dam	981017		5	15.07	7.01	1.34	320			5.2	
Fox Creek	Dam	980724	1253	0	29.34	8.68	10.28	202	19.1	1.07		2.5
Fox Creek	Dam	980724		1	27.72	8.63	10.66	201	4.2			
Fox Creek	Dam	980724		2	22.00	6.94	1.03	156	32.6			
Fox Creek	Dam	980724		3	18.61	9.84	0.27	214	21.9			
Fox Creek	Dam	980724		4	13.85	6.81	0.18	251	16.3			
Fox Creek	Dam	980724		4.5	13.37	6.83	0.13	254	18.4		4.5	
Fox Creek	Dam	980521	1031	0	21.42	7.27	5.75	195	50.0	0.28		1.3
Fox Creek	Dam	980521		1	20.60	7.20	4.59	194				
Fox Creek	Dam	980521		2	16.69	7.07	1.60	191				
Fox Creek	Dam	980521		3	14.04	6.84	0.09	202				

Lake	Site	Date	Time	Depth m	Temp oC	pH	D.O. ppm	Cond. µS	FTU	Zsd m	Zmax m	Photic Zone m
Fox Creek	Dam	980521		4	11.43	6.86	0.06	247				
Fox Creek	Dam	980521		4.8	10.90	7.17	0.06	271			4.8	
Greenbo	Dam	980518	1000	0	23.30	6.94	8.01	82	0.0	7.01		8.25
Greenbo	Dam	980518		1	22.52	6.91	7.93	80	0.0			
Greenbo	Dam	980518		2	19.48	6.9	8.67	78	0.0			
Greenbo	Dam	980518		3	17.96	6.87	9.5	76	0.0			
Greenbo	Dam	980518		4	15.19	6.83	9.32	75	0.0			
Greenbo	Dam	980518		5	12.82	6.74	9.66	74	0.0			
Greenbo	Dam	980518		6	10.43	6.68	10.3	75	0.0			
Greenbo	Dam	980518		7	8.08	6.57	9.11	75	0.0			
Greenbo	Dam	980518		8	7.21	6.46	6.57	75	0.0			
Greenbo	Dam	980518		9	6.69	6.45	4.49	75	0.0			
Greenbo	Dam	980518		10	6.46	6.47	4.03	76	0.0			
Greenbo	Dam	980518		11	6.30	6.56	3.58	79	0.0			
Greenbo	Dam	980518		12	6.28	6.56	3.52	79	0.0			
Greenbo	Dam	980518		13	6.27	6.66	3.21	79	0.5			
Greenbo	Dam	980518		14	6.24	6.71	3.12	79	0.9			
Greenbo	Dam	980518		15	6.23	6.71	2.9	80	1.1			
Greenbo	Dam	980518		16	6.21	6.75	2.47	80	3.4			
Greenbo	Dam	980518		17	6.20	6.75	0.75	80	13.2			
Greenbo	Dam	980518		18	6.20	6.82	0.21	81	26.1		18	
Greenbo	Mid	980518	1027	0	23.47	6.68	8.01	79	0.0	6.59		8.99
Greenbo	Mid	980518		1	22.99	6.76	8.1	79	0.0			
Greenbo	Mid	980518		2	21.48	6.62	8.9	78	0.0			
Greenbo	Mid	980518		3	18.40	6.61	9.96	77	0.0			
Greenbo	Mid	980518		4	15.59	6.65	10.6	73	0.0			
Greenbo	Mid	980518		5	13.52	6.69	10.82	74	0.0			
Greenbo	Mid	980518		6	10.72	6.71	11.35	75	0.0			
Greenbo	Mid	980518		7	9.02	6.61	9.11	74	0.0			
Greenbo	Mid	980518		8	7.96	6.55	8.69	75	0.0			
Greenbo	Mid	980518		9	7.22	6.32	4.88	75	0.0			
Greenbo	Mid	980518		10	6.80	6.18	4.17	75	0.0			
Greenbo	Mid	980518		11	6.66	6.15	3.58	76	0.0			
Greenbo	Mid	980518		12	6.48	6.12	3.63	,76	0.0			
Greenbo	Mid	980518		13	6.32	6.16	2.95	78	0.0		13	
Greenbo	Upper	980518		0	23.79	6.65	8.07	78	0.0	5.51		9.2
Greenbo	Upper	980518		1	23.50	6.73	8.01	79	0.0			
Greenbo	Upper	980518		2	21.44	6.63	8.94	77	0.0			
Greenbo	Upper	980518		3	19.30	6.59	9.15	76	0.0			
Greenbo	Upper	980518		4	14.98	6.63	10.61	72	0.0			
Greenbo	Upper	980518		5	12.83	6.67	11.21	73	0.0			
Greenbo	Upper	980518		6	11.42	6.71	10.99	73	0.0			
Greenbo	Upper	980518		7	9.31	6.61	8.65	75	0.0			
Greenbo	Upper	980518		8	7.90	6.28	3.40	77	0.0			
Greenbo	Upper	980518		9	7.16	6.14	2.35	77	0.0			
Greenbo	Upper	980518		10	6.66	6.11	2.53	77	0.0		10	
Greenbo	Dam	980702	947	0	27.47	6.89	7.87	84	36.8	4.98		6.3

Lake	Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
				m	oC		ppm	µS		m	m	m
Greenbo	Dam	980702		1	27.41	6.81	7.92	82	0.0			
Greenbo	Dam	980702		2	26.95	6.76	7.74	78	0.0			
Greenbo	Dam	980702		3	22.93	6.57	8.99	75	0.2			
Greenbo	Dam	980702		4	18.89	6.45	7.00	75	1.0			
Greenbo	Dam	980702		5	15.86	6.35	5.97	80	0.6			
Greenbo	Dam	980702		6	12.60	6.32	6.39	80	0.3			
Greenbo	Dam	980702		7	10.34	6.28	6.72	80	0.4			
Greenbo	Dam	980702		8	8.53	6.23	6.34	80	0.3			
Greenbo	Dam	980702		9	7.65	6.14	4.52	81	0.2			
Greenbo	Dam	980702		10	7.15	6.06	2.42	81	0.6			
Greenbo	Dam	980702		11	6.82	6.02	1.49	82	1.1			
Greenbo	Dam	980702		12	6.69	6.00	1.03	82	0.7			
Greenbo	Dam	980702		13	6.57	6.00	0.54	83	1.1			
Greenbo	Dam	980702		14	6.51	6.00	0.15	84	4.0			
Greenbo	Dam	980702		15	6.47	6.00	0.08	86	4.9			
Greenbo	Dam	980702		16	6.43	6.04	0.06	96	4.3		16	
Greenbo	Mid	980702	1019	0	27.47	6.91	7.93	77	0.3	4.79		6.5
Greenbo	Mid	980702		1	27.36	6.74	8.07	76	0.0			
Greenbo	Mid	980702		2	27.06	6.66	8.00	76	1.0			
Greenbo	Mid	980702		3	23.08	6.73	10.35	70	0.9			
Greenbo	Mid	980702		4	20.52	6.70	9.87	69	1.3			
Greenbo	Mid	980702		5	16.74	6.53	8.65	72	0.9			
Greenbo	Mid	980702		6	13.27	6.44	7.38	75	0.9			
Greenbo	Mid	980702		7	10.33	6.25	5.57	77	0.3			
Greenbo	Mid	980702		8	9.06	6.17	4.79	77	0.5			
Greenbo	Mid	980702		9	7.99	6.09	2.39	78	0.8			
Greenbo	Mid	980702		10	7.51	6.03	1.09	79	1.1			
Greenbo	Mid	980702		11	7.07	6.01	0.46	79	2.6			
Greenbo	Mid	980702		12	6.89	6.01	0.23	80	2.5			
Greenbo	Mid	980702		12.9	6.74	6.11	0.10	89	14.0		12.9	
Greenbo	Upper	980702	1044	0	27.27	6.81	8.25	74	0.0	3.04		
Greenbo	Upper	980702		1	27.24	6.73	8.25	74	0.0			
Greenbo	Upper	980702		2	26.97	6.60	8.10	74	1.4			
Greenbo	Upper	980702		3	26.26	6.40	7.17	74	1.4			
Greenbo	Upper	980702		4	19.78	6.38	7.91	68	1.9			
Greenbo	Upper	980702		5	16.94	6.32	6.64	73	16.7		5	
Greenbo	Dam	980925	1556	0	24.00	6.74	7.63	78	0.0	5.89		8.7
Greenbo	Dam	980925		1	23.80	6.64	7.68	78	0.0			
Greenbo	Dam	980925		2	23.75	6.45	7.67	78	0.0			
Greenbo	Dam	980925		3	23.71	6.47	7.69	77	0.0			
Greenbo	Dam	980925		4	23.57	6.50	7.61	78	0.0			
Greenbo	Dam	980925		5	22.58	6.46	7.19	77	0.0			
Greenbo	Dam	980925		6	17.67	6.18	4.83	87	0.7			
Greenbo	Dam	980925		7	13.22	6.08	1.54	88	0.6			
Greenbo	Dam	980925		8	10.24	6.17	0.85	90	1.8			
Greenbo	Dam	980925		9	8.60	6.25	0.43	93	1.4			
Greenbo	Dam	980925		10	7.77	6.22	0.28	91	0.0			

Lake	Site	Date	Time	Depth m	Temp oC	pH	D.O. ppm	Cond. µS	FTU	Zsd m	Zmax m	Photic Zone m
Greenbo	Dam	980925		11	7.14	6.33	0.21	97	0.0			
Greenbo	Dam	980925		12	6.94	6.43	0.17	103	0.8			
Greenbo	Dam	980925		13	6.85	6.52	0.15	109	0.9			
Greenbo	Dam	980925		14	6.80	6.60	0.12	112	1.7			
Greenbo	Dam	980925		15	6.74	6.67	0.11	118	1.5			
Greenbo	Dam	980925		16	6.67	6.75	0.10	126	2.9			
Greenbo	Dam	980925		16.9	6.64	6.95	0.08	155	0.0		16.9	
Greenbo	Mid	980925		0	23.79	6.59	7.34	74	0.0	4.51		7.2
Greenbo	Mid	980925		1	23.76	6.56	7.55	74	0.0			
Greenbo	Mid	980925		2	23.61	6.43	7.60	74	0.0			
Greenbo	Mid	980925		3	23.50	6.45	7.66	74	0.0			
Greenbo	Mid	980925		4	23.40	6.45	7.57	74	0.0			
Greenbo	Mid	980925		5	22.74	6.34	6.70	74	0.2			
Greenbo	Mid	980925		6	19.34	6.11	3.60	82	0.1			
Greenbo	Mid	980925		7	13.09	6.10	2.06	84	0.9			
Greenbo	Mid	980925		8	10.74	6.18	0.96	85	0.1			
Greenbo	Mid	980925		9	9.05	6.21	0.61	86	1.6			
Greenbo	Mid	980925		10	8.27	6.35	0.43	94	3.6			
Greenbo	Mid	980925		11	7.50	6.45	0.30	97	1.4			
Greenbo	Mid	980925		12	7.03	6.69	0.20	114	26.5		12.8	
Greenbo	Upper	980925		0	23.65	6.45	7.30	72	0.0			
Greenbo	Upper	980925		1	23.60	6.43	7.40	73	0.0			
Greenbo	Upper	980925		2	23.50	6.44	7.54	73	0.3			
Greenbo	Upper	980925		3	23.41	6.45	7.51	73	0.4			
Greenbo	Upper	980925		3.6	23.38	6.48	7.50	72	8.6		3.6	
Cannon	Dam	981017	1230	0	19.75	6.85	6.25	34	0.0	4.32		14.0
Cannon	Dam	981017		1	19.73	6.65	6.22	34	0.0			
Cannon	Dam	981017		2	19.71	6.54	6.44	34	0.0			
Cannon	Dam	981017		3	19.70	6.56	6.59	34	0.9			
Cannon	Dam	981017		4	19.70	6.62	6.63	34	0.7			
Cannon	Dam	981017		5	19.69	6.71	6.68	34	1.2			
Cannon	Dam	981017		6	19.04	6.61	6.91	34	1.6			
Cannon	Dam	981017		7	13.30	6.32	7.41	36	1.4			
Cannon	Dam	981017		8	10.26	6.21	6.78	36	2.0			
Cannon	Dam	981017		9	9.16	6.18	6.40	37	1.9			
Cannon	Dam	981017		10	7.97	6.15	5.86	37	1.4			
Cannon	Dam	981017		11	7.14	6.11	5.35	37	2.6			
Cannon	Dam	981017		12	6.67	6.08	4.92	37	3.1			
Cannon	Dam	981017		13	6.43	6.08	4.70	37	2.7			
Cannon	Dam	981017		14	6.20	6.01	4.09	38	2.8			
Cannon	Dam	981017		15	6.17	5.94	3.56	38	3.1			
Cannon	Dam	981017		16	6.09	5.90	3.10	39	3.5			
Cannon	Dam	981017		17	6.05	5.88	2.70	39	6.2			
Cannon	Dam	981017		18	5.99	5.86	2.24	40	7.1			
Cannon	Dam	981017		18.6	6.00	5.80	1.73	42	33.4		18.6	
Cannon	Upper	981017		0	20.17	6.84	6.35	34	0.0	4.26		13.0
Cannon	Upper	981017		1	19.84	6.66	6.52	34	0.0			

Lake	Site	Date	Time	Depth m	Temp oC	pH	D.O. ppm	Cond. µS	FTU	Zsd m	Zmax m	Photic Zone m
Cannon	Upper	981017		2	19.66	6.59	6.64	34	0.6			
Cannon	Upper	981017		3	19.58	6.51	6.73	34	2.0			
Cannon	Upper	981017		4	19.54	6.50	6.81	34	1.7			
Cannon	Upper	981017		5	19.49	6.54	6.88	34	1.8			
Cannon	Upper	981017		6	18.78	6.48	7.33	34	1.2			
Cannon	Upper	981017		7	13.48	6.19	7.32	36	0.8			
Cannon	Upper	981017		8	10.22	6.12	6.75	36	1.3			
Cannon	Upper	981017		9	8.87	6.09	6.14	36	1.9			
Cannon	Upper	981017		10	7.83	6.06	5.88	36	1.5			
Cannon	Upper	981017		11	7.23	6.04	5.26	36	2.1			
Cannon	Upper	981017		12	6.69	6.02	4.83	37	2.0			
Cannon	Upper	981017		13	6.42	5.98	4.25	38	2.6			
Cannon	Upper	981017		14	6.24	5.94	3.76	38	3.9			
Cannon	Upper	981017		15	6.13	5.86	3.03	39	3.4			
Cannon	Upper	981017		16	6.06	5.86	2.39	41	3.7			
Cannon	Upper	981017		17	6.02	5.86	1.91	41	6.4			
Cannon	Upper	981017		18	6.01	5.87	1.65	41	7.6			
Cannon	Upper	981017		19	5.99	5.87	1.47	41	9.0			
Cannon	Upper	981017		19.8	5.99	5.83	1.14	42	9.0		19.8	
Cannon	Dam	980526	1425	0	24.51	7.39	8.38	40	0.0	2.60		8.7
Cannon	Dam	980526		1	24.24	7.35	8.44	40	0.7			
Cannon	Dam	980526		2	22.15	7.19	10.23	39	2.2			
Cannon	Dam	980526		3	16.93	7.38	10.83	37	2.4			
Cannon	Dam	980526		4	13.39	7.20	10.34	37	2.7			
Cannon	Dam	980526		5	11.16	7.07	9.75	38	2.9			
Cannon	Dam	980526		6	9.81	6.99	9.44	39	2.0			
Cannon	Dam	980526		7	8.41	6.90	9.18	40	0.9			
Cannon	Dam	980526		8	7.81	6.85	8.98	40	0.6			
Cannon	Dam	980526		9	7.10	6.77	8.69	40	1.3			
Cannon	Dam	980526		10	6.67	6.71	8.32	40	0.7			
Cannon	Dam	980526		11	6.46	6.64	7.93	40	0.4			
Cannon	Dam	980526		12	6.25	6.60	7.39	41	0.3			
Cannon	Dam	980526		13	6.06	6.53	6.88	41	0.0			
Cannon	Dam	980526		14	5.93	6.47	6.66	41	0.0			
Cannon	Dam	980526		15	5.87	6.44	6.38	41	0.0			
Cannon	Dam	980526		16	5.81	6.39	6.03	41	0.0			
Cannon	Dam	980526		17	5.76	6.35	5.84	41	0.0			
Cannon	Dam	980526		18	5.74	6.33	5.69	42	0.0			
Cannon	Dam	980526		19	5.72	6.32	5.61	42	0.0			
Cannon	Dam	980526		20	5.69	6.29	5.44	42	0.0			
Cannon	Dam	980526		21	5.69	6.28	5.24	42	0.0			
Cannon	Dam	980526		22	5.69	6.25	4.70	43	0.0			
Cannon	Dam	980526		23	5.69	6.24	4.39	44	0.0		23	
Cannon	Upper	980526		0	25.26	7.27	8.22	36	0.0	2.71		9.8
Cannon	Upper	980526		1	24.57	7.31	8.38	36	0.6			
Cannon	Upper	980526		2	21.91	7.28	10.28	36	1.2			
Cannon	Upper	980526		3	17.84	7.41	11.10	35	1.1			

Lake	Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
				m	oC		ppm	µS		m	m	m
Cannon	Upper	980526		4	13.15	7.18	10.66	34	1.5			
Cannon	Upper	980526		5	10.99	7.08	10.21	36	1.1			
Cannon	Upper	980526		6	9.06	7.02	9.95	37	0.5			
Cannon	Upper	980526		7	7.62	6.97	9.51	38	0.0			
Cannon	Upper	980526		8	7.10	6.89	9.13	38	0.0			
Cannon	Upper	980526		9	6.83	6.80	8.71	38	0.0			
Cannon	Upper	980526		10	6.47	6.71	8.31	38	0.7			
Cannon	Upper	980526		11	6.34	6.66	8.10	38	0.0			
Cannon	Upper	980526		12	6.11	6.58	7.88	38	0.0			
Cannon	Upper	980526		13	6.01	6.56	7.55	38	0.0			
Cannon	Upper	980526		14	5.91	6.52	7.31	38	0.0			
Cannon	Upper	980526		15	5.84	6.48	7.13	38	0.0			
Cannon	Upper	980526		16	5.78	6.46	7.00	38	0.0			
Cannon	Upper	980526		17	5.71	6.42	6.66	39	0.0			
Cannon	Upper	980526		18	5.68	6.40	6.52	39	0.0			
Cannon	Upper	980526		19	5.65	6.37	6.33	39	0.0			
Cannon	Upper	980526		20	5.62	6.33	6.19	39	0.0			
Cannon	Upper	980526		21	5.61	6.31	6.07	39	0.0			
Cannon	Upper	980526		22	5.59	6.28	5.76	39	0.0			
Cannon	Dam	980822	800	0	27.32	7.41	7.82	37	0.9	4.32		9.8
Cannon	Dam	980822		1	27.32	7.40	7.81	37	0.7			
Cannon	Dam	980822		2	27.32	7.12	7.81	37	1.0			
Cannon	Dam	980822		3	27.32	7.03	7.88	36	0.9			
Cannon	Dam	980822		4	24.98	7.49	11.26	36	1.3			
Cannon	Dam	980822		5	19.04	7.58	12.14	37	0.6			
Cannon	Dam	980822		6	13.81	7.37	12.40	38	0.3			
Cannon	Dam	980822		7	11.00	7.03	11.52	38	0.3			
Cannon	Dam	980822		8	9.06	6.80	9.65	39	0.7			
Cannon	Dam	980822		9	7.79	6.61	8.10	39	0.3			
Cannon	Dam	980822		10	7.20	6.53	7.49	39	0.1			
Cannon	Dam	980822		11	6.74	6.42	6.92	39	0.2			
Cannon	Dam	980822		12	6.46	6.35	6.61	39	0.1			
Cannon	Dam	980822		13	6.23	6.30	6.32	39	0.0			
Cannon	Dam	980822		14	6.09	6.25	5.90	39	0.0			
Cannon	Dam	980822		15	5.93	6.21	5.43	39	0.0			
Cannon	Dam	980822		16	5.87	6.17	4.93	39	0.0			
Cannon	Dam	980822		17	5.82	6.15	4.60	39	0.0			
Cannon	Dam	980822		18	5.80	6.12	4.20	40	0.0			
Cannon	Dam	980822		19	5.78	6.10	3.64	40	0.2			
Cannon	Dam	980822		20	5.77	6.08	3.18	41	2.1			
Cannon	Dam	980822		21	5.75	6.07	2.65	41	1.7			
Cannon	Dam	980822		22	5.75	6.06	2.25	42	1.9			
Cannon	Dam	980822		23	5.73	6.05	1.65	42	0.8			
Cannon	Dam	980822		24	5.72	6.06	1.26	43	2.3			
Cannon	Dam	980822		25	5.72	6.05	1.09	43	3.3		25	
Cannon	Upper	980822		0	27.25	7.11	7.72	34	0.0	3.59		7.9
Cannon	Upper	980822		1	27.24	7.10	7.75	34	0.0			

Lake	Site	Date	Time	Depth m	Temp oC	pH	D.O. ppm	Cond. µS	FTU	Zsd m	Zmax m	Photic Zone m
Cannon	Upper	980822		2	27.25	7.03	7.78	34	0.0			
Cannon	Upper	980822		3	27.24	6.39	7.79	34	0.0			
Cannon	Upper	980822		4	26.29	6.71	9.11	34	7.9			
Cannon	Upper	980822		5	19.01	7.60	12.03	36	4.7			
Cannon	Upper	980822		6	13.78	6.97	11.61	36	2.0			
Cannon	Upper	980822		7	10.81	6.69	10.39	36	0.3			
Cannon	Upper	980822		8	8.80	6.51	8.59	37	0.9			
Cannon	Upper	980822		9	7.98	6.45	7.86	36	0.0			
Cannon	Upper	980822		10	7.15	6.37	7.24	37	0.3			
Cannon	Upper	980822		11	6.70	6.29	6.67	37	0.0			
Cannon	Upper	980822		12	6.42	6.25	6.30	38	0.0			
Cannon	Upper	980822		13	6.25	6.22	5.57	38	0.0			
Cannon	Upper	980822		14	6.09	6.16	5.28	38	0.0			
Cannon	Upper	980822		15	6.00	6.12	4.83	39	0.0			
Cannon	Upper	980822		16	5.93	6.11	4.46	39	0.0			
Cannon	Upper	980822		17	5.87	6.10	4.07	40	0.0			
Cannon	Upper	980822		18	5.83	6.09	3.50	40	0.0			
Cannon	Upper	980822		19	5.84	6.07	3.05	40	0.0			
Cannon	Upper	980822		20	5.82	6.07	2.46	41	2.2			
Cannon	Upper	980822		21	5.82	6.09	1.85	43	5.0		21	
Fishpond	Dam	981017	1600	0	20.03	8.02	7.49	651	2.5	5.16		7.8
Fishpond	Dam	981017		1	19.38	8.03	7.51	657	0.5			
Fishpond	Dam	981017		2	19.26	8.05	7.41	660	1.0			
Fishpond	Dam	981017		3	19.10	8.08	7.36	662	1.2			
Fishpond	Dam	981017		4	19.03	8.10	7.27	665	0.5			
Fishpond	Dam	981017		5	19.00	8.12	7.20	668	0.5			
Fishpond	Dam	981017		6	18.94	8.13	7.18	670	1.3			
Fishpond	Dam	981017		7	16.42	8.14	9.11	613	5.8			
Fishpond	Dam	981017		8	12.72	7.82	8.11	612	2.0			
Fishpond	Dam	981017		9	10.58	7.41	5.09	613	1.9			
Fishpond	Dam	981017		10	9.05	7.30	3.91	611	1.3			
Fishpond	Dam	981017		11	8.15	7.27	3.33	614	3.4			
Fishpond	Dam	981017		12	7.95	7.25	2.98	612	2.3			
Fishpond	Dam	981017		13	6.78	7.22	2.42	612	1.4			
Fishpond	Dam	981017		14	6.56	7.20	2.05	610	1.8			
Fishpond	Dam	981017		15	6.31	7.16	1.67	613	1.0			
Fishpond	Dam	981017		16	6.30	7.15	1.45	614	0.9			
Fishpond	Dam	981017		17	6.12	7.13	1.21	620	0.7			
Fishpond	Dam	981017		18	6.06	7.12	1.03	620	0.6			
Fishpond	Dam	981017		19	6.05	7.11	0.90	623	0.8			
Fishpond	Dam	981017		20	6.00	7.08	0.78	630	2.3			
Fishpond	Dam	981017		21	5.99	7.07	0.63	634	1.2			
Fishpond	Dam	981017		22.2	6.02	7.06	0.54	635	74.1		22.2	
Fishpond	Upper	981017		0	20.42	8.12	7.26	672	0.0	5.90		10.0
Fishpond	Upper	981017		1	19.74	8.08	7.27	678	0.3			
Fishpond	Upper	981017		2	19.17	8.09	7.33	680	0.3			
Fishpond	Upper	981017		3	19.06	8.08	7.34	681	2.0			

Lake	Site	Date	Time	Depth m	Temp oC	pH	D.O. ppm	Cond. µS	FTU	Zsd m	Zmax m	Photic Zone m
Fishpond	Upper	981017		4	19.01	8.09	7.26	684	1.6			
Fishpond	Upper	981017		5	18.95	8.10	7.23	687	1.3			
Fishpond	Upper	981017		6	18.89	8.08	6.89	690	1.9			
Fishpond	Upper	981017		7	15.04	7.65	6.71	640	1.8			
Fishpond	Upper	981017		8	12.01	7.33	4.17	629	1.6			
Fishpond	Upper	981017		9	10.45	7.31	2.81	627	0.7			
Fishpond	Upper	981017		10	9.32	7.31	2.12	630	5.5			
Fishpond	Upper	981017		11	8.06	7.23	1.71	629	1.9			
Fishpond	Upper	981017		12	7.33	7.22	1.42	626	2.3			
Fishpond	Upper	981017		13	6.82	7.19	1.11	624	1.2			
Fishpond	Upper	981017		14	6.55	7.17	0.88	625	0.7			
Fishpond	Upper	981017		15	6.40	7.16	0.67	626	0.7			
Fishpond	Upper	981017		16	6.30	7.14	0.51	628	0.6			
Fishpond	Upper	981017		17	6.16	7.12	0.44	631	0.7		17	
Fishpond	Dam	980821	1434	0	26.59	8.43	7.89	695	0.0	4.54		7.9
Fishpond	Dam	980821		1	26.08	8.43	8.24	699	11.2			
Fishpond	Dam	980821		2	25.92	8.40	8.31	699	0.0			
Fishpond	Dam	980821		3	25.77	8.35	8.29	699	0.0			
Fishpond	Dam	980821		4	23.73	7.77	8.49	695	1.0			
Fishpond	Dam	980821		5	18.93	8.35	12.87	649	3.0			
Fishpond	Dam	980821		6	15.28	8.26	12.57	633	1.1			
Fishpond	Dam	980821		7	12.07	8.28	12.02	625	7.5			
Fishpond	Dam	980821		8	10.60	8.06	10.08	622	13.1			
Fishpond	Dam	980821		9	8.96	7.88	7.84	621	0.0			
Fishpond	Dam	980821		10	8.04	7.62	3.54	621	2.1			
Fishpond	Dam	980821		11	7.52	7.56	1.96	621	2.6			
Fishpond	Dam	980821		12	7.00	7.54	0.71	622	0.4			
Fishpond	Dam	980821		13	6.62	7.51	0.43	622	0.2			
Fishpond	Dam	980821		14	6.49	7.49	0.27	623	0.0			
Fishpond	Dam	980821		15	6.31	7.48	0.24	624	0.0			
Fishpond	Dam	980821		16	6.00	7.47	0.22	625	0.0			
Fishpond	Dam	980821		17	5.98	7.45	0.20	626	0.0			
Fishpond	Dam	980821		18	5.98	7.42	0.20	629	0.0			
Fishpond	Dam	980821		19	5.98	7.40	0.20	634	0.0			
Fishpond	Dam	980821		20	5.98	7.38	0.20	640	0.2			
Fishpond	Dam	980821		21	5.98	7.38	0.20	644	0.0			
Fishpond	Dam	980821		22	5.97	7.36	0.20	654	5.3			
Fishpond	Dam	980821		23	6.00	7.19	0.20	645	0.6		23	
Fishpond	Upper	980821		0	27.74	8.36	8.02	694	0.0	3.95		7.7
Fishpond	Upper	980821		1	26.22	8.36	8.63	701	5.9			
Fishpond	Upper	980821		2	25.97	8.32	8.63	702	0.0			
Fishpond	Upper	980821		3	25.78	8.32	8.56	703	0.0			
Fishpond	Upper	980821		4	24.00	7.77	8.04	734	0.0			
Fishpond	Upper	980821		5	19.88	7.69	10.49	664	0.0			
Fishpond	Upper	980821		6	14.73	7.95	10.53	644	6.4			
Fishpond	Upper	980821		7	12.45	7.61	5.01	642	3.1			
Fishpond	Upper	980821		8	10.27	7.44	1.90	642	5.9			

Lake	Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
				m	oC		ppm	µS		m	m	m
Fishpond	Upper	980821		9	8.93	7.41	0.90	631	1.1		9	
Fishpond	Upper	980528	1820	0	23.64	8.6	8.06	578	0	5.83		10.9
Fishpond	Upper	980528		1	23.26	8.54	8.65	600	0			
Fishpond	Upper	980528		2	21.73	8.27	10.4	712	0			
Fishpond	Upper	980528		3	17.96	8.30	12.58	711	0.0			
Fishpond	Upper	980528		4	15.05	8.31	12.10	671	0.2			
Fishpond	Upper	980528		5	13.28	8.41	11.80	641	0.0			
Fishpond	Upper	980528		6	11.02	8.59	12.78	609	0.0			
Fishpond	Upper	980528		7	9.41	8.54	11.60	593	0.0			
Fishpond	Upper	980528		8	8.05	8.28	9.05	592	0.3			
Fishpond	Upper	980528		9	7.56	8.04	6.14	593	8.8			
Fishpond	Upper	980528		10	7.22	7.83	3.34	592	3.6			
Fishpond	Upper	980528		11	6.67	7.73	2.13	592	1.1			
Fishpond	Upper	980528		12	6.48	7.68	1.24	592	2.3			
Fishpond	Upper	980528		13	6.20	7.60	0.50	590	3.7			
Fishpond	Upper	980528		14	6.07	7.58	0.18	590	5.2			
Fishpond	Upper	980528		15	5.98	7.56	0.14	594	0.0			
Fishpond	Upper	980528		16	5.95	7.54	0.11	596	0.0		16	
Fishpond	Dam	980528	1650	0	23.86	8.66	8.07	598	0.0	4.86		9.2
Fishpond	Dam	980528		1	23.84	8.60	8.24	600	0.0			
Fishpond	Dam	980528		2	20.24	8.60	12.83	633	0.0			
Fishpond	Dam	980528		3	17.99	8.51	12.29	637	0.0			
Fishpond	Dam	980528		4	15.09	8.47	11.81	636	0.0			
Fishpond	Dam	980528		5	12.63	8.55	12.19	613	0.0			
Fishpond	Dam	980528		6	10.99	8.82	14.54	598	0.0			
Fishpond	Dam	980528		7	9.27	8.93	15.93	590	0.0			
Fishpond	Dam	980528		8	8.03	8.65	12.46	593	0.0			
Fishpond	Dam	980528		9	7.30	8.30	9.42	596	0.0			
Fishpond	Dam	980528		10	6.91	8.04	6.73	598	2.5			
Fishpond	Dam	980528		11	6.62	7.92	5.08	597	2.3			
Fishpond	Dam	980528		12	6.35	7.80	2.88	597	4.3			
Fishpond	Dam	980528		13	6.09	7.70	1.02	598	11.1			
Fishpond	Dam	980528		14	5.92	7.63	0.34	599	9.3			
Fishpond	Dam	980528		15	5.86	7.60	0.27	600	8.3			
Fishpond	Dam	980528		16	5.81	7.59	0.20	602	2.2			
Fishpond	Dam	980528		17	5.76	7.60	0.14	604	0.0			
Fishpond	Dam	980528		18	5.75	7.60	0.11	604	0.0			
Fishpond	Dam	980528		19	5.73	7.60	0.09	606	0.0			
Fishpond	Dam	980528		23	5.72	7.53	0.07	616	0.0		23	
Martin	Upper	980521	1055	0	23.40	7.59	7.74	68	10	1.94		3.7
Martin	Upper	980521		1	22.77	7.4	7.39	68	3.2			
Martin	Upper	980521		2	16.89	7.02	7.51	60	14.1			
Martin	Upper	980521		3	13.74	6.91	6.04	63	9.6			
Martin	Upper	980521		4	11.35	6.89	5.53	76	11.2			
Martin	Upper	980521		4.8	10.37	6.89	5.37	100	10.6		4.8	
Martin	Dam	980521		0	23.79	7.1	7.96	68	2.6	1.68		3.4
Martin	Dam	980521		1	21.95	6.98	9.36	64	5.5			

Lake	Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
				m	oC		ppm	µS		m	m	m
Martin	Dam	980521		2	16.96	6.97	9.42	71	9.7			
Martin	Dam	980521		3	13.41	6.84	8.74	64	9.2			
Martin	Dam	980521		4	11.34	6.81	8	73	9.9			
Martin	Dam	980521		5	10.39	6.8	6.89	100	6.3			
Martin	Dam	980521		6	7.41	6.86	3.61	101	5.6			
Martin	Dam	980521		7	6.47	6.98	3.4	576	2.4			
Martin	Dam	980521		8	6.04	7.07	3.18	637	2.6			
Martin	Dam	980521		9	5.95	7.11	2.61	673	1.5			
Martin	Dam	980521		10	5.92	7.25	1.96	689	1.4			
Martin	Dam	980521		11	5.92	7.17	1.27	699	2.1			
Martin	Dam	980521		12.5	5.90	7.15	1.04	698	4.7		12.5	
Martin	Upper	980702	1400	0	26.81	7.01	7.22	179	0.1	2.22		4.92
Martin	Upper	980702		1	26.41	7.03	7.39	175	0.9			
Martin	Upper	980702		2	25.41	6.88	6.59	148	1.6			
Martin	Upper	980702		3	22.07	6.68	6.13	105	2.2			
Martin	Upper	980702		4	19.00	6.55	4.74	89	5.7			
Martin	Upper	980702		5	16.37	6.44	2.26	89	10.6			
Martin	Upper	980702		6	12.80	6.38	0.79	96	12.2			
Martin	Upper	980702		6.5	10.40	6.52	0.14	415	9		6.5	
Martin	Dam	980702		0	26.78	7.23	7.6	201	1.3	1.35		4.33
Martin	Dam	980702		1	26.38	7.18	7.65	197	1			
Martin	Dam	980702		2	25.74	7.19	7.12	280	1.9			
Martin	Dam	980702		3	25.52	7.27	7.24	284	2.9			
Martin	Dam	980702		4	18.10	6.87	5.01	104	8.2			
Martin	Dam	980702		5	16.02	6.67	3.99	98	7.2			
Martin	Dam	980702		6	12.57	6.59	1.78	95	16.7			
Martin	Dam	980702		7	8.44	6.68	1.23	507	3.1			
Martin	Dam	980702		8	7.01	6.79	0.84	544	2.3			
Martin	Dam	980702		9	6.55	6.85	0.83	588	1.4			
Martin	Dam	980702		10	6.32	6.89	0.38	607	1.3			
Martin	Dam	980702		11	6.27	6.91	0.09	623	1.1			
Martin	Dam	980702		12	6.23	6.94	0.03	627	81.4			
Martin	Dam	980925		0	23.34	8.05	7.36	597	5.9	1.35		4.3
Martin	Dam	980925		1	23.27	8.03	7.44	596	4.6			
Martin	Dam	980925		2	23.01	7.99	7.40	590	6.5			
Martin	Dam	980925		3	22.94	8.00	7.40	600	5.9			
Martin	Dam	980925		4	22.57	8.04	7.43	634	7.1			
Martin	Dam	980925		5	21.52	7.89	6.61	654	7.6			
Martin	Dam	980925		6	14.55	7.28	2.51	590	4.3			
Martin	Dam	980925		7	9.94	7.22	1.21	621	1.9			
Martin	Dam	980925		8	7.97	7.24	0.65	658	3.7			
Martin	Dam	980925		9	7.39	7.27	0.46	674	1.6		9	
Martin	Upper	980925		0	23.08	7.86	7.04	565	0.0	1.00		3.6
Martin	Upper	980925		1	22.96	7.89	7.06	568	10.1			
Martin	Upper	980925		2	22.85	7.86	6.99	565	8.1			
Martin	Upper	980925		3	22.74	7.81	6.81	561	9.1			
Martin	Upper	980925		4	22.49	7.72	6.45	553	11.1			

Lake	Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
				m	oC		ppm	µS		m	m	m
Martin	Upper	980925		5	22.32	7.50	5.07	584	39.0			
Martin	Upper	980925		5.8	19.57	7.28	3.27	554	58.6		5.8	
Pan Bowl	Mid	980528	1431	0	25.55	7.08	7.7	163	9.8	1.39		3.4
Pan Bowl	Mid	980528		1	23.94	7.11	8.37	171	3.8			
Pan Bowl	Mid	980528		2	18.07	7.20	9.62	160	4.3			
Pan Bowl	Mid	980528		3	13.89	6.93	1.61	178	2.1			
Pan Bowl	Mid	980528		4	12.23	6.85	0.22	204	3.5			
Pan Bowl	Mid	980528		4.5	11.73	6.91	0.11	232	8.6		4.5	
Pan Bowl	Dam	980528		0	25.08	7.19	8.14	169	4.6	1.62		3.79
Pan Bowl	Dam	980528		1	24.09	7.20	7.9	170	2.6			
Pan Bowl	Dam	980528		2	18.06	7.19	8.22	188	3.3			
Pan Bowl	Dam	980528		3	14.8	6.99	3.17	195	2.5			
Pan Bowl	Dam	980528		4	12.75	6.89	0.45	202	1.7			
Pan Bowl	Dam	980528		5	11.34	6.87	0.12	243	2.7		5	
Pan Bowl	Mid	980727		0	27.32	7.31	7.15	150	0	1.33		3.3
Pan Bowl	Mid	980727		1	27.12	7.4	7.67	152	2.9			
Pan Bowl	Mid	980727		2	26.59	7.07	6.35	152	5.2			
Pan Bowl	Mid	980727		3	23.64	6.8	1.83	156	9.2			
Pan Bowl	Mid	980727		4	18.11	6.72	0.54	194	10.7			
Pan Bowl	Mid	980727		4.69	14.52	6.81	0.23	244	19.5		4.69	
Pan Bowl	Dam	980727		0	27.83	7.35	7.61	146	0.2	1.15		3
Pan Bowl	Dam	980727		1	27.37	7.39	7.46	148	2.9			
Pan Bowl	Dam	980727		2	26.09	7.38	7.55	149	4.4			
Pan Bowl	Dam	980727		3	21.35	6.92	2.63	159	5.9			
Pan Bowl	Dam	980727		4	15.99	6.73	0.65	208	7.1			
Pan Bowl	Dam	980727		5	13.57	6.78	0.26	256	8.6			
Pan Bowl	Dam	980727		5.45	12.67	6.89	0.19	302	18.6		5.45	
Pan Bowl	Mid	980926	1100	0	19.1	6.66	2.06	176	0	1.54		3.1
Pan Bowl	Mid	980926		1	18.78	6.61	1.82	176	2.5			
Pan Bowl	Mid	980926		2	18.72	6.65	1.78	176	4.2			
Pan Bowl	Mid	980926		3	18.7	6.67	1.76	176	4.7			
Pan Bowl	Mid	980926		4	18.69	6.69	1.74	176	5.2			
Pan Bowl	Mid	980926		4.73	18.67	6.68	1.48	177	10.8		4.73	
Pan Bowl	Dam	980926		0	20.01	6.67	2.93	173	0	2.55		2.8
Pan Bowl	Dam	980926		1	18.92	6.57	2.38	172	2.4			
Pan Bowl	Dam	980926		2	18.79	6.6	2.11	172	3.3			
Pan Bowl	Dam	980926		3	18.77	6.64	1.99	172	3.3			
Pan Bowl	Dam	980926		4	18.75	6.66	1.80	173	3.6			
Pan Bowl	Dam	980926		5	18.65	6.67	1.62	175	3.1			
Pan Bowl	Dam	980926		5.8	15.99	7.03	0.26	524	45.4		5.8	
Greenbr	Mid	980519		0	26.70	8.65	11.33	320	0.0	1.56		3.1
Greenbr	Mid	980519		1	24.92	8.63	13.02	323	8.3			
Greenbr	Mid	980519		2	18.24	7.89	6.61	346	6.6			
Greenbr	Mid	980519		3	15.65	7.48	0.38	361	4.6			
Greenbr	Mid	980519		4	14.77	7.40	0.15	366	3.8			
Greenbr	Mid	980519		5	13.74	7.38	0.11	363	2.5			
Greenbr	Mid	980519		6	12.81	7.37	0.09	358	4.0			

Lake	Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
				m	oC		ppm	µS		m	m	m
Greenbr	Mid	980519		6.5	12.39	7.37	0.06	365			6.5	
Greenbr	Dam	980519		0	27.01	8.22	11.01	304	0.0	1.42		3.9
Greenbr	Dam	980519		1	26.39	8.21	11.25	311	8.0			
Greenbr	Dam	980519		2	20.74	7.88	9.48	323	6.1			
Greenbr	Dam	980519		3	16.25	7.41	0.49	344	3.4			
Greenbr	Dam	980519		4	14.73	7.36	0.30	347	3.2			
Greenbr	Dam	980519		5	13.90	7.35	0.20	348	2.1			
Greenbr	Dam	980519		6	13.44	7.33	0.07	345	2.5			
Greenbr	Dam	980519		7	12.22	7.33	0.05	346	2.6			
Greenbr	Dam	980519		8	11.40	7.33	0.03	344	3.2			
Greenbr	Dam	980519		9	10.71	7.33	0.03	349	3.1			
Greenbr	Dam	980519		10	8.69	7.36	0.01	369				
Greenbr	Dam	980519		11.5	8.43	7.33	0.01	377			11.5	
Greenbr	Mid	980727	1025	0	26.38	9.05	11.55	230	33.9	0.41		1.9
Greenbr	Mid	980727		1	26.26	8.91	11.26	235	29.3			
Greenbr	Mid	980727		2	25.62	7.61	1.00	289	12.3			
Greenbr	Mid	980727		3	21.66	7.34	0.15	287	15.0			
Greenbr	Mid	980727		4	20.03	7.30	0.10	303	16.8			
Greenbr	Mid	980727		5	17.79	7.32	0.08	356	14.1			
Greenbr	Mid	980727		6	14.53	7.31	0.06	357	8.6			
Greenbr	Mid	980727		7	13.12	7.24	0.06	365	9.6			
Greenbr	Mid	980727		7.82	12.45	7.22	0.05	367	28.0		7.82	
Greenbr	Dam	980727		0	26.50	8.91	12.92	237	31.8	0.42		2.0
Greenbr	Dam	980727		1	26.10	8.31	9.23	258	25.3			
Greenbr	Dam	980727		2	25.64	7.64	2.71	288	11.4			
Greenbr	Dam	980727		3	22.15	7.41	1.01	295	14.9			
Greenbr	Dam	980727		4	20.07	7.32	0.38	315	15.9			
Greenbr	Dam	980727		5	17.65	7.31	0.23	359	11.9			
Greenbr	Dam	980727		6	14.43	7.29	0.16	359	8.9			
Greenbr	Dam	980727		7	13.23	7.27	0.13	360	7.5			
Greenbr	Dam	980727		8	12.24	7.23	0.11	364	5.4			
Greenbr	Dam	980727		9	11.89	7.22	0.09	366	6.3			
Greenbr	Dam	980727		10	11.35	7.19	0.08	370	7.0			
Greenbr	Dam	980727		11	10.85	7.17	0.07	375	10.4			
Greenbr	Dam	980727		11.4	10.63	7.16	0.07	380	51.9		11.4	
Greenbr	Mid	981016		0	20.96	7.57	5.37	269	0.0	1.01		3.1
Greenbr	Mid	981016		1	17.98	7.48	5.31	272	8.2			
Greenbr	Mid	981016		2	17.72	7.22	3.73	274	7.8			
Greenbr	Mid	981016		3	17.47	7.17	2.83	276	11.7			
Greenbr	Mid	981016		4	16.95	7.04	0.68	304	23.4			
Greenbr	Mid	981016		5	15.49	6.94	0.31	374	22.9			
Greenbr	Mid	981016		5.32	14.93	6.94	0.20	392	62.2		5.32	
Greenbr	Dam	981016		0	21.99	7.39	4.65	276	4.1	2.55		2.9
Greenbr	Dam	981016		1	18.76	7.57	5.51	275	7.3			
Greenbr	Dam	981016		2	17.74	7.36	4.58	275	7.2			
Greenbr	Dam	981016		3	17.52	7.23	3.66	276	7.2			
Greenbr	Dam	981016		4	17.28	7.09	1.74	290	15.3			

Lake	Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
				m	oC		ppm	µS		m	m	m
Greenbr	Dam	981016		5	14.57	6.97	0.76	379	7.9			
Greenbr	Dam	981016		6	13.35	6.93	0.44	387	6.1			
Greenbr	Dam	981017		7	12.71	6.90	0.30	394	5.7			
Greenbr	Dam	981018		8	12.07	6.87	0.20	400	5.1			
Greenbr	Dam	981019		9	11.57	6.84	0.15	406	5.9			
Greenbr	Dam	981020		10	11.08	6.77	0.12	429	7.2			
Greenbr	Dam	981021		10.2	10.91	6.74	0.10	442	21.3		10.2	
Mill Cr	Dam	980521	1709	0	25.25	7.56	8.18	83	0.0	1.98		5.1
Mill Cr	Dam	980521		1	20.16	7.30	9.59	82	1.0			
Mill Cr	Dam	980521		2	15.06	7.28	9.27	80	3.8			
Mill Cr	Dam	980521		3	11.59	7.20	8.40	81	3.6			
Mill Cr	Dam	980521		4	9.61	7.16	8.34	88	3.9			
Mill Cr	Dam	980521		5	7.75	7.15	8.35	97	2.5			
Mill Cr	Dam	980521		6	6.44	7.15	8.17	100	1.5			
Mill Cr	Dam	980521		7	5.96	7.12	7.83	103	1.4			
Mill Cr	Dam	980521		8	5.58	7.05	6.47	112	1.7			
Mill Cr	Dam	980521		9	5.36	7.00	5.68	119	1.4			
Mill Cr	Dam	980521		10	5.29	6.96	4.89	125	1.4			
Mill Cr	Dam	980521		11	5.25	6.90	4.07	130	1.4			
Mill Cr	Dam	980521		12	5.30	6.85	2.65	137	1.2			
Mill Cr	Dam	980521		13	5.41	6.80	0.52	150	2.8			
Mill Cr	Dam	980521		13.8	5.49	6.89	0.29	171	14.8		13.8	
Mill Cr	Dam	980705	1100	0	23.26	7.66	8.99	78	8.6	0.78		2.8
Mill Cr	Dam	980705		1	20.62	7.65	9.27	71	17.5			
Mill Cr	Dam	980705		2	17.83	7.15	6.98	72	45.4			
Mill Cr	Dam	980705		3	16.62	6.86	4.66	81	72.2			
Mill Cr	Dam	980705		4	12.48	6.79	5.13	94	40.5			
Mill Cr	Dam	980705		5	8.73	6.79	5.92	101	13.5			
Mill Cr	Dam	980705		6	7.44	6.76	6.06	103	11.4			
Mill Cr	Dam	980705		7	6.60	6.72	5.51	107	8.9			
Mill Cr	Dam	980705		8	6.12	6.65	4.68	112	8.2			
Mill Cr	Dam	980705		9	5.82	6.57	3.55	118	6.5			
Mill Cr	Dam	980705		10	5.58	6.52	1.80	125	6.5			
Mill Cr	Dam	980705		11	5.55	6.48	0.45	135	7.2			
Mill Cr	Dam	980705		12	5.62	6.47	0.18	154	9.4			
Mill Cr	Dam	980705		13	5.69	6.48	0.12	175	7.1			
Mill Cr	Dam	980705		14	5.81	6.54	0.09	199	3.7		14	
Mill Cr	Dam	981016	1740	0	21.49	7.05	5.56	122	24.0	3.37		7.0
Mill Cr	Dam	981016		1	18.32	6.94	5.67	120	0.2			
Mill Cr	Dam	981016		2	18.45	6.92	5.72	119	0.0			
Mill Cr	Dam	981016		3	17.95	6.95	5.79	119	0.1			
Mill Cr	Dam	981016		4	17.72	6.97	5.81	118	0.0			
Mill Cr	Dam	981016		5	15.94	6.45	3.89	109	0.8			
Mill Cr	Dam	981016		6	10.92	6.43	3.47	111	0.1			
Mill Cr	Dam	981016		7	9.02	6.41	2.87	115	0.2			
Mill Cr	Dam	981016		8	7.32	6.40	1.59	119	0.0			
Mill Cr	Dam	981016		9	6.88	6.40	1.21	123	0.7			

Lake	Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
				m	oC		ppm	µS		m	m	m
Mill Cr	Dam	981016		10	6.46	6.46	0.94	142	0.5			
Mill Cr	Dam	981016		11	6.17	6.58	0.75	168	2.4			
Mill Cr	Dam	981016		12	6.15	6.66	0.59	182	3.4			
Mill Cr	Dam	981016		13	6.19	6.71	0.47	205	4.2			
Mill Cr	Dam	981016		13.2	6.26	6.73	0.37	234	3.1		13.2	
Tyner	Dam	981016	930	0	18.63	7.21	7.40	62	2.7	3.4		7.0
Tyner	Dam	981016		1	18.67	7.15	7.29	62	3.3			
Tyner	Dam	981016		2	18.66	7.14	7.26	61	2.6			
Tyner	Dam	981016		3	18.66	7.18	7.32	61	3.4			
Tyner	Dam	981016		4	18.65	7.19	7.17	61	3.9			
Tyner	Dam	981016		5	18.58	7.05	6.86	61	5.6			
Tyner	Dam	981016		6	13.84	6.39	3.11	82	7.8			
Tyner	Dam	981016		7	10.82	6.39	1.82	87	7.7			
Tyner	Dam	981016		8	9.19	6.45	1.11	88	5.0			
Tyner	Dam	981016		9	8.47	6.56	0.79	98	5.3			
Tyner	Dam	981016		10	8.07	6.63	0.50	106	4.5			
Tyner	Dam	981016		11	7.82	6.65	0.35	114	4.4			
Tyner	Dam	981016		11.9	7.71	6.65	0.29	119	4.2		11.9	
Tyner	Dam	980526	1130	0	23.71	7.60	8.54	73	0.4	3.35		5.6
Tyner	Dam	980526		1	23.59	7.47	8.57	73	2.6			
Tyner	Dam	980526		2	21.96	7.31	8.30	74	3.6			
Tyner	Dam	980526		3	17.10	7.23	8.94	73	3.7			
Tyner	Dam	980526		4	13.92	6.94	4.48	73	3.3			
Tyner	Dam	980526		5	12.38	6.85	3.82	75	2.2			
Tyner	Dam	980526		6	9.49	6.77	3.49	75	1.9			
Tyner	Dam	980526		7	8.27	6.71	3.57	75	1.6			
Tyner	Dam	980526		8	7.57	6.67	3.61	75	1.3			
Tyner	Dam	980526		9	7.27	6.61	3.33	76	0.9			
Tyner	Dam	980526		10	7.04	6.58	2.97	77	3.4			
Tyner	Dam	980526		11	6.94	6.54	2.72	78	1.1			
Tyner	Dam	980526		12	6.85	6.52	2.25	80	1.1			
Tyner	Dam	980526		13	6.88	6.52	2.00	81	1.1			
Tyner	Dam	980526		13.9	6.84	6.52	1.91	82	0.7		13.9	
Tyner	Dam	980822	1142	0	27.43	7.71	7.89	62	0.9	3.35		5.6
Tyner	Dam	980822		1	27.15	7.64	7.97	63	0.8			
Tyner	Dam	980822		2	27.01	7.58	7.98	63	1.0			
Tyner	Dam	980822		3	26.63	7.31	7.70	63	7.0			
Tyner	Dam	980822		4	23.22	7.36	9.28	65	1.8			
Tyner	Dam	980822		5	16.36	6.73	3.28	69	6.1			
Tyner	Dam	980822		6	11.65	6.60	1.21	79	2.7			
Tyner	Dam	980822		7	9.69	6.62	0.71	78	0.6			
Tyner	Dam	980822		8	8.56	6.61	0.34	76	1.3			
Tyner	Dam	980822		9	8.10	6.65	0.25	81	0.5			
Tyner	Dam	980822		10	7.79	6.71	0.21	89	0.5			
Tyner	Dam	980822		11	7.60	6.79	0.18	99	1.9			
Tyner	Dam	980822		12	7.45	6.84	0.15	108	3.1			
Tyner	Dam	980822		13	7.43	6.87	0.13	110	3.1		13	

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INTRODUCTION

Eleven reservoirs in eastern and central Kentucky were assessed to determine if there were any significant problems with nonpoint pollution. All reservoirs were sampled at least three times during the growing season in accordance to the guidelines set forth in the Memorandum of Agreement between Morehead State University and the Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water. All the data from this study has been submitted to Mr. Cliff Schneider at the Division of Water. The data are available on STORET, and are included in the appendices of this report. This report summarizes results of the investigations of the eleven reservoirs. Also included are recommendations on potential nonpoint pollution problems that may need to be addressed in the future.

The lakes are ranked in terms of water quality. This report presents the lakes as ranked--from highest quality to poorest. The discussions of the land use in the watersheds are based upon professional judgment, personal observations of the region, as well as, inferences from the water quality data collected.

METHODS

Three times during the 1998 growing season, eleven lakes were sampled. Lakes and sampling sites for analysis were selected by the Kentucky Division of Water. Maps of lakes and sampling sites are included in **Appendix D**. At each site, a profile was taken of dissolved oxygen, temperature, pH, and conductivity using a Hydrolab Datasonde 4 (Hydrolab Corporation, Austin, TX). The probe was calibrated within 24 h of sampling. Dissolved oxygen was air calibrated based upon barometric pressure, pH was calibrated using 4.00, 7.00, and 10.00 standards, temperature using an NIST certified thermometer, and conductivity using NIST certified standards (Fisher Scientific, Pittsburgh, PA). The datasonde was fitted with an underwater light sensor, which was compared to a deck sensor to determine photic zone depths. The photic zone was considered to end at the depth where 99.9% of the deck measurement of photosynthetically active radiation (PAR) disappeared. Secchi depth was determined as the average of measurements taken by two or three observers.

Duplicate photic zone water samples were taken at each site for all parameters. Water samples were taken with a Van Dorn bottle every 0.5 meters of the photic zone--500 ml from each depth was mixed in an acid washed bucket to obtain an integrative photic zone sample. This sample was filtered through a precombusted 0.45 µm glass fiber filter (Whatman GF/A) directly after sampling on the boat.

The filter was placed in a centrifuge tube, wrapped in aluminum foil, and placed on ice. In the lab, 10 ml of 90% alkalized acetone was added to the filter, the filter was homogenized, then left to steep at < 4°C for at least 24 hours. The tube was centrifuged and the extract examined for chlorophyll a using a Turner Model 10AU Flourometer (Turner Designs, 845 W. Maude Ave., Sunnyvale, CA 94086) (EPA Method 445.0). The flourometer was standardized using NIST certified standards purchased from Turner Designs, and checked against standards using chlorophyll *a* from *Anacystis nidulans* (Sigma Chemical Co., P.O. Box 14508, St. Louis, MO 63178). These were also checked against Turner gel standards.

Concentrations of soluble reactive phosphorus in the filtrant were analyzed using the ascorbic acid method (EPA Method 365.3). Total phosphorus was determined after persulfate digestion (EPA Method 365.3). Ammonium was determined via Nesslerization, and nitrite with the sulfanilamide method (EPA Method 354.1). Nitrate was determined by using the sulfanilamide method after copperized cadmium reduction (EPA Method 353.3). Total Kjeldahl nitrogen was determined by digestion with sulfuric acid, potassium sulfate, and mercuric sulfate (EPA Method 351.3) in a Lachet BD-46 Block Digestor programmed for Kjeldahl digestions (Lachet Instruments, 6645 West Mill Road, Milwaukee, WI, 53218). Alkalinity was determined by titration with 0.02 *N* sulfuric acid to the appropriate bromcresol green-methyl red end point using a NIST certified buret.

All spectrophotometric analyses were performed using a Hach DR 2010 or 2000 Spectrophotometer (Hach Chemical Company, P.O. Box 389, Loveland, CO) fitted with a flow-through cell to eliminate problems with matched glassware. Every time a set of samples was analyzed, two sets of standards were analyzed concurrently with the samples to construct a standard curve for each chemical analyzed. Standard curves always included at least three samples inside the range of concentrations measured, and two samples at the extremes of the concentrations measured. The two sets of standards were made by diluting standards purchased from two separate suppliers (Hach Chemical Co. and Fisher Scientific).

Carlson's TSI (Carlson, 1977) was calculated for total phosphorus, chlorophyll a, and Secchi depth. To help assess nonpoint pollution problems, comparisons were made between TSIs

(Carlson, 1991; Havens, 1995). Determinations of water quality were completed using the best professional judgment of the principal investigator, based upon his experience and knowledge of regional reservoirs (Davis, 1995) and the effects of nonpoint pollution on aquatic ecosystems (Reeder, 1994).

RESULTS AND DISCUSSION

Cannon Creek Lake

Cannon Creek is a soft water, very low alkalinity lake. Of the dozens of lakes I have analyzed in the Commonwealth, this lake has the highest water quality. It is located near some of the highest points in the state, near pristine forest. For a lake in the mountains, it is extraordinarily wide. The low nutrient concentrations, low productivity, and width result in a water column that stays oxidized into the hypolimnion. Similar oligotrophic reservoirs in eastern Kentucky are anoxic at synonymous depths.

The Secchi transparency and chlorophyll concentrations are commensurate with what would be found in most oligotrophic lakes. There is more phosphorus than would normally be found in an oligotrophic lake, which could suggest a nitrogen, rather than phosphorus, limitation to algal growth. However, it is not uncommon for lakes in this region to have high total phosphorus, but still be phosphorus limited. Bioassay experiments in similar oligotrophic lakes in eastern Kentucky usually resulted in a determination that phosphorus is the limiting nutrient. Most of the total phosphorus in the water must not be bioavailable. This could be the result of organic matter (tree pollen, leaves) adding to the total phosphorus in the water, but not providing bioavailable phosphorus.

Like many of the lakes in this study, the watershed of this lake was mined and logged near the beginning of this century. The current watershed is mostly forested. Because this lake is the water supply for the city of Pineville and the surrounding area, keeping water quality high is of paramount importance.

The lake is used for recreation, but gas motors are prohibited. The area near the dirt boat ramp has some solid waste problems (mostly litter). There are unkempt campsites dotting the perimeter of the lake. During the performance of this research, there was moderate to low fishing pressure.

This lake is more susceptible to mining than any other lake studied. Any disturbance to the watershed could be catastrophic. The low alkalinity water has no ability to buffer perturbations. It is important that the watershed for this lake stay undisturbed. There will probably be pressure to mine this area, since the geology suggests significant coal seams exist under the mountains. Mining is the worst possible activity that could occur to this type of low alkalinity lake. Most of the native biota of the lake would be quickly killed, and water treatment expenses would increase.

Because the watershed is mostly forested, there is not a significant problem with nonpoint sources of pollution. Little evidence was observed that nonpoint pollution was threatening the water quality of the lake.

Greenbo Lake

Greenbo is also a soft water, low alkalinity lake--probably due to its position near the coal fields. This lake had the greatest transparency of any lake measured in this region. There is little inorganic nitrogen, and this nitrogen tends to stay oxidized (more nitrate than ammonium). This suggests there is little problem with BOD causing anoxia in the photic zone. Total phosphorus is fairly low, and there is little bioavailable phosphorus, resulting in low algal biomass.

The Secchi depth and chlorophyll concentrations are commensurate with what would be found in most oligotrophic lakes in the region. There is more phosphorus than would normally be found in an oligotrophic lake, which could suggest a nitrogen, rather than phosphorus, limitation to algal growth. However, it is not uncommon for lakes in this region to have high total phosphorus, but still be phosphorus limited. Bioassay experiments in similar oligotrophic lakes in eastern Kentucky inevitably result in finding a phosphorus limitation. Most of the total phosphorus in the water must not be bioavailable. This could be the result of organic matter (tree pollen, leaves) adding to the total phosphorus in the water, but not the bioavailable phosphorus.

Greenbo has a fairly pristine forested watershed because it is located within a state resort park. There is a boat dock near the main inflow. Boat speed is regulated (idle speed on entire lake), but not horsepower. There was moderate to-high fishing pressure at the times the lake was analyzed. There was no obvious problem with water quality near the boat dock and ramp, nor any sediment pollution near the inflows. The lake is in steeply sloping mountains; therefore, the light does not penetrate strongly to the shaded edges of the lake. The lake had been stocked with grass carp in the past, which educed most of the littoral vegetation. Evidence suggests nonpoint pollution is not affecting the water quality of this lake.

Fishpond Lake

Fishpond had extraordinary hardness and alkalinity. It has a higher alkalinity than the lakes sampled in the limestone region of the Commonwealth--despite its location high on a mountain in the middle of the Pennsylvanian rocks that characterize the eastern Kentucky coal fields. For a small reservoir, it is extremely deep because of the steepness of the landscape where the dam was built.

Low iron concentrations, high conductivity and alkalinity, and high pH, suggest the water is being limed. This would precipitate the iron, strip the phosphate from the water, and increase the conductivity and alkalinity. There was another enigma in this lake: most of the limited amount of phosphorus appears to be bioavailable, yet chlorophyll concentrations are low to moderate. One possible reason for this is due to the lab methodology used to measure soluble reactive phosphate. The acidic reagents used to measure SRP may be breaking the loosely bound calcium phosphate complexes, formed by liming, that were held together under the high pH. These complexes may not be readily bioavailable to the lake phytoplankton, yet we would measure them as ortho-phosphate.

Another reason for the high total phosphorus, low chlorophyll relationship could be that inorganic nitrogen is the primary limiting factor in this lake. The water is clear, creating a deep photic zone. The Secchi depth is quite deep for a lake with chlorophyll averaging nearly 4μg/L. Therefore, there is little non-algal turbidity (tripton). The photic zone stays well oxygenated.

Fishpond sits high in the mountains and most of the watershed is forested. A roadway circles the lake. We observed a great deal of recreational use for such a small remote area, with numerous picnic areas dotting the lakeside. There is a boat dock near the middle of the lake, and another near the dam. There is no obvious runoff of sediment near the inflows. The lake is in steeply sloping mountains; therefore no prolonged strong solar insulation reaches the edge of the lake.

Mill Creek Lake

This is a small reservoir located within Natural Bridge State Resort Park. The water has a moderate alkalinity and high iron concentrations. Inorganic nitrogen concentrations and iron concentrations are higher than I expected to find in a lake located within what appears to be a pristine watershed. This could be due to the rock type and its erodability. Most of the inorganic nitrogen is oxidized, and the oxygen concentrations are relatively high for a small serpentine mountain reservoir.

Phosphorus concentrations are fairly high, creating moderate algal growth and reduced transparency. However, some of the transparency reduction is due to tripton since the Secchi depths are shallower than would be predicted given the algal biomass. This tripton could be sediment, but we were unable to locate a significant source.

The area is very popular for recreation because it is near the internationally popular Red River Gorge and Natural Bridge recreation sites. There is a large parking area and boat ramp at the dam. The watershed is a protected forest. Despite that, the water quality is not indicative of an oligotrophic reservoir, which is what would be expected from an examination of the maps and a tour of the watershed. No obvious problem with human disturbance near the boat dock or within the watershed was observed.

Any management strategy in the watershed should look at reducing sediment and phosphorus loading. Perhaps activity in the upper watershed could be adding phosphorus to the lake. We were unable to discern any current problems with nonpoint pollution in the watershed. The steep slopes in the watershed cause the area to respond to any pollutant loading fairly rapidly so continued monitoring is important.

Martin County: Curtis Crum Lake (Inez)

Inez is a small reservoir used for drinking water and recreation. On the first two sampling dates, we observed extraordinary increases in salinity and conductivity near the bottom of the lake. Initially, we suspected something had been dumped into the lake by vandals. However, on the last sampling date, the high alkalinity was evenly distributed throughout the lake. The unusual water conditions were probably created by some sort of "management strategy," because the measurements are not congruent with the lake's morphometry, landscape position, and geology.

The alkalinity was moderate, but peculiar for a lake in the eastern Kentucky coal region. The nitrogen levels were not high, but total phosphorus was higher than would be expected. The majority of the inorganic nitrogen is oxidized and the photic zone did not have significant problems with anoxia. Despite the high total phosphorus, there is little algal growth in the lake. Perhaps whatever is being added to the lake has algacidal effects. Despite the low chlorophyll concentrations, the Secchi depth averaged only about 3 meters--about half as deep as would be expected in a lake with such low algal biomass.

The watershed is mostly forested. There is a dirt access road to a ramp near the back of the lake that runs along one side of the lake. The area near the dirt ramp seems to be well used by local beer drinkers that do not properly dispose of their trash. Most of the watershed is forested. There is no obvious nonpoint pollution in the watershed.

Tyner Reservoir

Tyner is a fairly soft water lake, but it is still well buffered for a lake in its region. The transparency is very good. The top four meters of the photic zone tend to stay well oxygenated. This may be facilitated by planktonic photosynthesis--the pH is high for a lake with low conductivity and the line where primary production stops is distinct near the metalimnion.

Inorganic nitrogen concentrations are low and dominated by nitrate. Ammonium concentrations were extremely low. Total and soluble reactive phosphate concentrations were also low. There was more algal biomass than would be expected given the paucity of nutrients. This could be caused by high organismal turnover rates—perhaps a coupling between bacteria and plankton algae. High total nitrogen concentrations support this hypothesis.

Tyner is a water supply. There is a water plant located by the outlet and a dirt road leading to a mud boat ramp. The boat ramp area may be providing a bit of sediment to the lake, but it does not look significant. There are cattle grazing up to the edge of the lake and the pasture is probably the cause of the high chlorophyll levels in the lake. Given the poor agricultural management, the water quality is still fairly good. Perhaps the animal density is low.

Carter Caves Lake (Smokey Valley)

Carter Caves Lake has moderately hard water and a large shallow inflow dominated by submersed aquatic vegetation. The hardness is probably due to its geologic position near the karst section of eastern Kentucky. The Secchi depth and total phosphorus concentrations are commensurate with what would be found in most eutrophic lakes. Low chlorophyll suggests that most of the turbidity in this lake is not due to algae, suggesting sediment runoff is significant. The water is cloudy. There are moderate quantities of inorganic nitrogen, and much of this is reduced (ammonium), suggesting that anoxia and decomposition in the photic zone are reducing water quality. This will restrict fish production in the lake. Total phosphorus is moderately high and a significant percentage is bioavailable. However, algal biomass is not as high as would be expected given the abundance of nutrients.

Smokey Valley has a fairly pristine forested watershed because it is located within a state resort park. There is a boat dock on the edge of the main inflow and a boat-house midway up the lake. No gas motors are allowed on the lake. The shallow back-waters were choked with submersed aquatic vegetation during the last sampling visit. These weeds were too thick to promote their use as a fish nursery, but they should prevent sediment and nutrients from reaching the dam.

Lake Carnico

Carnico is a hard water, moderate alkalinity lake. This is probably due to its geologic position near the central Kentucky limestone region. The lake has moderate concentrations of nitrate and ammonium. There was a problem with nitrogen reduction during the mid-summer sampling period (more ammonium than nitrate). Total phosphorus is indicative of a eutrophic lake.

There was much variability in water quality during different sampling periods. There was also variability in conductivity in the water column. This suggests some sort of "management" being performed--either liming, fertilization, or both. This would certainly not be necessary to raise the productivity of the lake, because it is in a nutrient rich rock type and the land use in the watershed probably contributes significant quantities of bioavailable nutrients.

The oxygen levels in the photic zone were generally high as was the algal biomass. The data suggest there may be non-algal turbidity. Contrary to normal lakes, the deepest Secchi depths were sometimes observed when algal biomass was the highest.

The lake is located near a golf course. Vacation homes ring the portions of the lake not bordered by the golf course. The houses surrounding the lake are on steeply sloping, loose soils.

There is a boat dock and sand beach near the dam that was always busy when we collected samples and there was moderate fishing pressure. Boat speed and horsepower are regulated. There is no obvious problem with water quality near the boat dock and ramp, nor obvious runoff of sediment near the inflows. Although there is a small buffer of trees between the golf course and the lake, nutrients, pesticides and herbicides probably still drain into the lake.

Action should be taken to create more of a buffer between the lake and the practices in the watershed, and any liming or fertilization activities should cease.

Pan Bowl Lake

Pan Bowl is a fairly large oxbow of the Kentucky River. The water color is usually brown or gray. Alkalinity is moderate and nitrogen concentrations are not a significant concern, but the phosphate concentrations are high. The water supports a healthy algal population, but the concentrations of algal biomass are not as high as would be expected for a lake with such low transparency. Therefore, it could be surmised that tripton is a significant contributor to the turbidity of the water. This could be creating a light limitation for the plankton algae.

Despite relatively low nitrogen to phosphorus ratios, we did not observe manifestations characteristic of nuisance blue-green algal blooms. Autochthonous and allochthonous organic loading is having a dramatic effect on the water quality. During October, even the upper layers of water had less than 3 mg/L of dissolved oxygen. Few species of fish could survive in this water. It is also probable that microbial pathogens are introduced into the water from the surrounding homes.

Nonpoint and point pollution are both evident in this watershed. Because of its morphometry, this lake would probably be eutrophic regardless of the watershed characteristics. Although much of the higher elevations in the watershed are forested, the lake fringe is bordered by homes and commercial development. Because it is isolated hydrologically (no large distinct inflows or outflows), the lake gets most of its inflow via sheet flow passing through the houses and road that ring the lake. There was a massive construction project going on within the "U" of the Pan Bowl, which created significant particulate air pollution. These particulates contributed to the poor water quality as they settled.

Management of the watershed problems would be relatively difficult. The lake is used for swimming and fishing. The recreational use is high because of its location within a metropolitan area and houses ring the lake. Dryfall is probably a significant source of nitrogen and phosphorus as well as particulate material.

Greenbriar Lake

Greenbriar is a hard water, high alkalinity lake because it lays in the limestone region near central Kentucky. The lake has high concentrations of total and bioavailable phosphorus. This supports some algal growth but not extraordinary phytoplankton biomass. Inorganic nitrogen is also high with much of the nitrogen being reduced (ammonium). The high iron and soluble reactive phosphorus concentrations and anoxic hypolimnion indicate that there is internal as well as external loading of phosphorus.

The low Secchi depths would normally indicate that the lake should have nearly double the algal biomass. Chlorophyll concentrations in the lake are probably limited by light. Most of the tripton (non-algal turbidity) is brown so there is probably watershed soil coming into the lake.

Greenbriar is a "pay lake" with a serpentine shape. The nonpoint pollution problem is readily evident. The watershed is mostly grazing land and most of the pastures reach to the edge of the lake. There is no buffer along the majority of the lake's perimeter. It was not uncommon for us to see cattle grazing in the lake. Most of the water quality problems in this lake probably stem from the agricultural practices in the watershed.

Although it is a narrow "pay lake," we did not see much fishing pressure on the lake. The lake has horsepower limits and a ramp at the dam. There did not appear to be any effects on the water quality from the commercial activities.

Fox Creek Lake (Sandlick)

Fox Creek Lake has moderate to high alkalinity brown water. The water was not clear during any sampling event. This lake had the highest algal biomass and lowest transparency. Decaying organic matter kept dissolved oxygen levels low.

The inorganic nitrogen concentrations were the highest measured during the course of this study. Most of the nitrogen was reduced to ammonium and anoxia (defined as < 4 mg/L D.O.) reached into the shallow photic zone. Total phosphorus concentrations were high but not extraordinary. The total phosphorus concentrations were more than adequate to support strong algal blooms and high phytoplankton biomass. The high iron concentrations suggest benthic anoxia is adequate to allow the sediment to act as a source of orthophosphate into the lake; therefore, the lake could have a problem with "runaway" eutrophication.

Although the algal biomass was high, the water was not green. Because the Secchi depths indicate a stronger degree of eutrophication than chlorophyll, some of the turbidity is probably non-algal.

We tested to see if tripton could be due to cattle waste. Near the dam, fecal coliform concentrations were 40 colonies per 100 ml, and total coliform was 1920 colonies per 100 ml. At the beach, fecal coliforms were 60 colonies per 100 ml, and total coliform was 2400 colonies per ml.

Fox Creek is a "pay lake" with a diversity of land uses in the watershed. The lake had numerous small trailers around it used by recreational visitors. Each trailer had its own waste disposal container for sewage. No evidence was found that human sewage from the trailers was going into the lake.

Much of the area bordering the lake is forested but the small ring of forest is surrounded by agricultural land. Agriculture is probably the primary land use in the watershed. There is a boat ramp near the dam. There was moderate fishing pressure. There is no obvious problem with water quality near the boat dock and ramp due to activities there. The watershed problems in Fleming County are well quantified by the Commonwealth of Kentucky. Measures are already being taken to reduce nonpoint pollution in this region.

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APPENDIX A. RECOMMENDATIONS

- Fox Creek Lake needs watershed management to control agricultural runoff. Plans are already in place to implement strategies to help contain and reduce the current nutrient loading. Because Fox Creek is small, it has a chance of recovering from the high nutrient inputs.
- Both Greenbriar Lake and Tyner Lake are receiving significant runoff from farms that abut the lake edge. Buffer zones need to be placed between the livestock and the lakes.
- Lake Carnico needs to be investigated further to determine if human management is part of the eutrophication problem and if nonpoint pollution from the golf course and homes is the major contributor of nutrients and sediments. Sediment stabilization is needed on lakeside homes and golf course runoff should be treated, possibly with a wetland treatment system before entering the lake.
- Further analysis is required in the Mill Creek watershed to determine the source of nutrients.
- Fishpond and Curtis Crum (Martin County) lakes have higher alkalinity that their geomorphic position would suggest they should have. There is a probability that this is due to point sources of pollution or some sort of lake management strategy (some fish biologists lime lakes). Investigations should be undertaken to determine the sources of carbonates.
- Although Pan Bowl Lake is not healthy, both nonpoint and point sources of pollution are evident. Because of its landscape position and morphometry, it is not well suited for any simple management plan that could increase water quality. I would suggest monitoring fecal coliform bacteria, and creating buffer zones in the inner portion to reduce nonpoint runoff from the urbanized areas.
- Even though the watershed is protected at Smokey Valley (Carter Caves State Resort Park), there seems to be significant sediment reaching the lake. This watershed needs further study to determine the sources of sediments and nitrogen to the lake. It could be that the easily erodable rock is the main problem. If this is the case, the best way to manage the lake is to increase the wetland perimeter area. This would be expensive and would necessitate replacing part of the walkway along the lake edge with wetland. Because the lake is relatively shallow, it may not be possible to increase the water quality. High water clarity could result in increased plant growth.

- Cannon Creek and Greenbo lakes should be monitored to insure that they keep their high water quality. Because of the low alkalinity in both lakes, no mining activity should be allowed to occur in the watershed since they are particularly susceptible to acid mine drainage.

Table 1. Lake Mean Nutrient Concentrations and Trophic Status Indices (TSI)

	Nutrient (µg/L)											D.O		Turb.	Cond	TSI		
Lake	NO3	NO2	NH4	TKN	Iron	TP	SRP	ALK	SD	Photic	Chl a	mg/L	pH	NTU	µS	Chla	TP	SD
Cannon Creek	134	5	30	300	65	12	7.4	8	3.6	10.5	2.11	6.15	6.5	2	38	38	40	41
Greenbo	78	6	52	233	101	29	2.9	7	5.5	7.9	2.27	5.44	6.47	2	81	39	53	35
Fishpond	119	5	54	617	34	19	10.6	222	5.0	8.9	3.42	5.23	7.12	2	371	43	47	37
Martin Co.	142	9	91	517	173	28	7.9	57	2.9	4.0	1.63	4.86	7.16	8	371	35	52	45
Mill Creek	196	19	72	500	248	25	7.8	28	2.0	5.0	3.47	4.46	6.85	8	122	43	51	50
Tyner	171	7	3	767	102	14	8.2	16	2.6	6.1	7.07	3.2	6.89	3	79	50	42	46
Carter Caves	97	5	129	683	138	21	7.6	109	1.8	3.8	2.55	5.5	7.56	8	261	40	48	52
Carnico	115	5	101	933	162	23	5.5	103	1.3	3.6	4.28	5.94	7.94	16	221	45	49	56
Pan Bowl	111	6	101	717	137	35	12.3	45	1.7	3.2	4.78	3.41	6.92	6	192	46	55	53
Greenbriar	217	8	237	700	224	39	11.8	166	1.0	2.8	5.62	2.57	7.45	12	335	48	57	61
Fox Creek	205	9	367	767	351	16	12.7	64	0.7	1.9	16.8	3.8	7.53	23	223	58	44	64

All nutrient are given in µg/L; alkalinity in mgCaCO3/L; Secchi depth (SD) and photic zone depth (Photic) in m.
D.O., pH, NTU, Cond. means for entire water column, nutrients are means of photic zone.
Lakes are ranked by author from highest to lowest water quality.

APPENDIX B. LAKE NUTRIENT DATA

Lake	Site	Date	Time	Depth	NH3	NOX	TKN	TP	TDP	O-P	CHL A	ALK
				m	ppm	ppm	ppm	ppm	ppm	ppm	ppb	
Greenbo	Dam	980518	1000	8.3	0.053	0.01	0.6	0.048		0.003	0.7	8.3
Greenbo	Mid	980518	1027	9.0	0.03	0.02	0.3	0.042		0.002	0.4	7.3
Greenbo	Upper	980518	1057	9.2	0.02	0.01	0.1	0.030		0.001	0.3	7.3
Greenbo	Dam	980702	947	6.3	0.08	0.01	0.0	0.025		0.004	2.3	11.3
Greenbo	Mid	980702	1019	6.5	0.052	0.01	0.0	0.025		0.003	4.1	8.2
Greenbo	Upper	980702	1044	5.0	0.04	0.01	0.0	0.037		0.004	4.2	8.0
Greenbo	Dam	980925	1556	8.7	0.072	0.24	0.4	0.016		0.005	3.5	5.6
Greenbo	Mid	980925	1556	7.2	0.045	0.24	0.4	0.017		0.004	2.7	5.0
Greenbo	Upper	980925	1556	3.6	0.081	0.21	0.3	0.021		0.002	2.2	5.2
Carter Ca	Dam	980518	1408	4.6	0.03	0.05	0.4	0.035		0.001	0.8	0.0
Carter Ca	Upper	980518	1408	2.0	0.017	0.01	0.3	0.028		0.000	0.1	0.0
Carter Ca	Dam	980724	950	4.9	0.214	0.08	2.0	0.018		0.006	2.0	97.6
Carter Ca	Upper	980724	950	2.8	0.374	0.08	1.4	0.021		0.006	4.7	117.1
Carter Ca	Dam	981017	1207	3.0	0.062	0.19	0.0	0.011		0.018	2.7	110.8
Carter Ca	Upper	981017	1207	2.0	0.081	0.20	0.0	0.015		0.015	5.0	109.0
Carnico	Dam	980518	1153	6.0	0.068	0.12	0.4	0.019		0.001	2.3	176.7
Carnico	Upper	980518	1153	3.0	0.065	0.12	0.6	0.040		0.001	4.5	181.9
Carnico	Dam	980724	1600	2.3	0.175	0.07	2.4	0.024		0.004	2.0	53.9
Carnico	Upper	980724	1600	2.8	0.188	0.07	2.2	0.026		0.005	2.3	52.3
Carnico	Dam	981017	1620	4.1	0.059	0.17	0.0	0.015		0.013	7.9	75.8
Carnico	Upper	981017	1620	3.2	0.05	0.17	0.0	0.014		0.007	6.7	75.5
Greenbr	Dam	980519		3.9	0.138	0.34	0.5	0.063		0.005	1.2	277.6
Greenbr	Mid	980519		3.1	0.119	0.39	0.9	0.056		0.004	0.1	277.8
Greenbr	Dam	980727	1025	2.0	0.304	0.04	1.5	0.024		0.005	2.3	94.9
Greenbr	Mid	980727	1025	1.9	0.182	0.06	0.7	0.023		0.014	1.5	105.4
Greenbr	Dam	981016		2.9	0.32	0.26	0.3	0.037		0.019	13.7	121.1
Greenbr	Mid	981016		3.1	0.362	0.26	0.3	0.034		0.024	14.9	122.0
Mill Cr	Dam	980521	1709	5.1	0.024	0.08	0.9	0.012		0.005	1.1	23.4
Mill Cr	Dam	980705	1100	2.8	0.146	0.28	0.0	0.048		0.011	6.5	21.0
Mill Cr	Dam	981016	1740	7.0	0.046	0.28	0.6	0.016		0.009	2.8	39.9
Pan Bowl	Dam	980528	1431	3.8	0.05	0.11	0.2	0.031		0.017	5.8	37.6
Pan Bowl	Mid	980528		3.4	0.032	0.04	0.7	0.014		0.014	5.7	38.6
Pan Bowl	Dam	980727		3.0	0.171	0.03	1.4	0.049		0.006	2.9	42.5
Pan Bowl	Mid	980727	1100	3.3	0.175	0.04	1.4	0.027		0.006	5.0	44.4
Pan Bowl	Dam	980926	1100	2.8	0.113	0.24	0.3	0.055		0.023	5.7	54.5
Pan Bowl	Mid	980926	1055	3.1	0.067	0.23	0.3	0.036		0.009	3.6	54.6
Martin	Dam	980521	1055	3.4	0.037	0.01	0.7	0.036		0.020	1.0	10.5
Martin	Upper	980521	1400	3.7	0.038	0.01	0.5	0.025		0.018	0.9	10.1
Martin	Dam	980702	1400	4.3	0.09	0.15	0.5	0.021		0.002	2.3	39.5
Martin	Upper	980702		4.9	0.093	0.07	0.2	0.028		0.003	3.0	27.8
Martin	Dam	980925		4.3	0.09	0.17	0.8	0.040		0.003	1.5	114.2
Martin	Upper	980925	1031	3.6	0.135	0.35	0.4	0.020		0.005	1.1	116.8
Fox Creek	Dam	980521	1253	1.3	0.7	0.19	0.6	0.000		0.021	5.2	56.4
Fox Creek	Dam	980724	1420	2.5	0.27	0.01	1.5	0.035		0.007	4.7	56.3
Fox Creek	Dam	981017	1425	2.0	0.13	0.24	0.2	0.013		0.011	40.5	79.5
Cannon	Dam	980526	1425	8.7	0.069	0.12	0.3	0.008		0.004	3.0	6.5

Lake	Site	Date	Time	Depth	NH3	NOX	TKN	TP	TDP	O-P	CHL A	ALK
				m	ppm	ppm	ppm	ppm	ppm	ppm	ppb	
Cannon	Upper	980526	800	9.8	0.061	0.15	0.2	0.009		0.003	3.3	6.8
Cannon	Dam	980822	800	9.8	0.004	0.07	0.3	0.014		0.011	1.6	7.0
Cannon	Upper	980822	1230	7.9	0	0.08	0.4	0.014		0.011	3.1	6.2
Cannon	Dam	981017	1230	14.0	0.02	0.20	0.3	0.007		0.004	0.8	10.1
Cannon	Upper	981017		13.0	0.024	0.21	0.3	0.022		0.008	0.9	9.7
Tyner	Dam	980526	1130	5.6	0.015	0.12	0.7	0.024		0.004	7.2	15.1
Tyner	Dam	980822	1142	5.6	0.038	0.16	0.4	0.008		0.012	6.0	16.8
Tyner	Dam	981016	930	7.0	0.037	0.26	1.2	0.011		0.010	8.0	16.0
Fishpond	Dam	980528	1650	9.2	0.091	0.08	0.5	0.028		0.008	1.8	225.0
Fishpond	Upper	980528	1434	10.9	0.092	0.08	0.9	0.019		0.008	3.3	215.0
Fishpond	Dam	980821	1434	7.9	0.047	0.07	0.5	0.012		0.011	6.7	235.0
Fishpond	Upper	980821	1600	7.7	0.046	0.10	0.5	0.018		0.012	4.7	230.0
Fishpond	Dam	981017	1600	7.8	0.026	0.21	0.7	0.017		0.015	1.3	211.0
Fishpond	Upper	981017		10.0	0.023	0.20	0.6	0.019		0.010	2.7	214.4

APPENDIX C. LAKE DEPTH PROFILES

Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
			m	oC		ppm	µS		m	m	m
Dam	980518	1153	0	24.87	8.58	9.14	243	0.0	2.33		6.0
Dam	980518		1	24.22	8.63	9.89	240	3.7			
Dam	980518		2	21.07	8.57	10.48	239	3.8			
Dam	980518		3	17.68	7.78	7.08	241	5.0			
Dam	980518		4	16.26	7.57	5.55	242	4.2			
Dam	980518		5	15.67	7.58	5.32	241	4.3			
Dam	980518		6	14.12	7.47	4.05	245	48.3		6	
Upper	980518		0	25.53	8.48	8.67	237	30.7	1.56		3.0
Upper	980518		1	24.93	8.39	8.76	237	2.8			
Upper	980518		2	24.53	8.06	7.49	240	17.3			
Upper	980518		3	18.35	7.67	6.15	240	0.8		3	
Dam	980724	1600	0	28.57	8.99	10.06	182	0.0	0.77		2.3
Dam	980724		1	28.37	8.97	10.93	181	15.9			
Dam	980724		2	27.38	8.84	9.93	182	14.5			
Dam	980724		3	25.33	7.64	3.74	196	7.6			
Dam	980724		4	22.26	7.42	0.53	229	7.8			
Dam	980724		5	18.36	7.33	0.20	256	11.0			
Dam	980724		6	14.45	7.20	0.13	255	11.4			
Dam	980724		7	12.50	7.15	0.10	256	14.1			
Dam	980724		8	11.49	7.12	0.09	258	18.1		8.3	
Upper	980724		0	29.43	8.90	9.24	182	10.5	0.59		2.8
Upper	980724		1	27.92	8.89	10.19	182	18.5			
Upper	980724		2	27.48	8.12	5.89	186	34.6			
Upper	980724		3	25.57	7.48	2.18	199	51.8			
Upper	980724		3.3	24.43	7.35	0.87	204	53.1		3.3	
Dam	981017	1620	0	18.28	8.07	8.54	193		1.24		4.1
Dam	981017		1	18.30	8.04	8.00	193				
Dam	981017		2	18.11	7.99	7.66	195				
Dam	981017		3	17.86	7.93	7.08	197				
Dam	981017		4	17.77	7.89	7.01	197				
Dam	981017		5	17.62	7.77	5.68	203				
Dam	981017		6	17.41	7.70	4.15	199				
Dam	981017		7	14.30	7.42	1.61	271				
Dam	981017		8	12.00	7.38	1.48	268				
Dam	981017		9	10.57	7.32	1.45	269				
Dam	981017		10	10.38	7.31	1.37	281			10	
Upper	981017		0	18.88	8.19	9.27	194		1.51		3.2
Upper	981017		1	18.90	8.17	9.35	194				
Upper	981017		2	18.88	8.16	9.12	192				
Upper	981017		2.6	18.86	8.15	9.15	193			2.6	
Dam	981017	1207	0	18.00	7.54	7.31	256		1.22		3.0
Dam	981017		1	17.80	7.56	7.50	254				
Dam	981017		2	16.89	7.57	7.26	253				
Dam	981017		3	16.87	7.56	7.06	256				
Dam	981017		4	16.84	7.56	7.00	253				
Dam	981017		5	16.79	7.53	6.20	250				

Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
			m	oC		ppm	µS		m	m	m
Dam	981017		6	16.25	7.43	3.44	256				
Dam	981017		7	15.95	7.32	1.65	257			7	
Upper	981017		0	17.41	7.70	7.76	254		1.02		
Upper	981017		1	16.77	7.66	7.00	251				
Upper	981017		2	16.55	7.64	6.23	253			2	
Dam	980518	1408	0.0	23.34	8.1	8.99	274	0.0	2.16		4.6
Dam	980518		1.0	20.63	8.25	11.5	258	1.0			
Dam	980518		2.0	17.12	8.46	12.8	225	2.9			
Dam	980518		3.0	12.92	8.02	9.42	202	13.1			
Dam	980518		4.0	11.80	7.68	6.63	213	11.9			
Dam	980518		5.0	11.32	7.59	5.25	226	9.8			
Dam	980518		6.0	10.51	7.46	2.55	224	14.0			
Dam	980518		7.0	9.06	7.42	1.93	234	10.8			
Dam	980518		8.0	7.81	7.27	0.21	277	10.2		8	
Upper	980518		0.0	23.67	8.1	8.87	282	10.0	1.69		
Upper	980518		1.0	22.65	7.77	8.37	287	3.3			
Upper	980518		2.0	16.05	7.65	6.94	258	10.7		2	
Dam	980724	950	0	28.04	7.99	7.11	281	0.5	2.70		4.9
Dam	980724		1	27.73	7.98	7.42	283	0.6			
Dam	980724		2	27.28	7.59	6.77	285	0.5			
Dam	980724		3	22.46	7.56	7.75	230	2.3			
Dam	980724		4	17.30	7.25	2.87	209	1.2			
Dam	980724		5	14.70	7.08	0.56	216	1.9			
Dam	980724		6	13.14	7.05	0.22	225	14.3			
Dam	980724		7	11.53	6.94	0.13	250	8.0			
Dam	980724		8	9.74	6.9	0.09	315	9.0			
Dam	980724		8.7	8.85	6.83	0.08	442	12.2		8.7	
Upper	980724		0	27.88	7.67	6.48	291	2.3	1.80		2.8
Upper	980724		1	27.61	7.6	6.58	291	3.2			
Upper	980724		2	27.17	7.4	5.1	295	7.5			
Upper	980724		2.8	24.90	7.11	0.49	303	55.4		2.8	
Dam	981017	1420	0	16.92	8.02	9.45	206		0.89		2.0
Dam	981017		1	16.50	7.82	7.60	209				
Dam	981017		2	16.40	7.82	8.32	209				
Dam	981017		3	16.34	7.63	5.50	208				
Dam	981017		4	15.59	7.18	1.56	281				
Dam	981017		5	15.07	7.01	1.34	320			5.2	
Dam	980724	1253	0	29.34	8.68	10.28	202	19.1	1.07		2.5
Dam	980724		1	27.72	8.63	10.66	201	4.2			
Dam	980724		2	22.00	6.94	1.03	156	32.6			
Dam	980724		3	18.61	9.84	0.27	214	21.9			
Dam	980724		4	13.85	6.81	0.18	251	16.3			
Dam	980724		4.5	13.37	6.83	0.13	254	18.4		4.5	
Dam	980521	1031	0	21.42	7.27	5.75	195	50.0	0.28		1.3
Dam	980521		1	20.60	7.20	4.59	194				
Dam	980521		2	16.69	7.07	1.60	191				
Dam	980521		3	14.04	6.84	0.09	202				

Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
			m	oC		ppm	µS		m	m	m
Dam	980521		4	11.43	6.86	0.06	247				
Dam	980521		4.8	10.90	7.17	0.06	271			4.8	
Dam	980518	1000	0	23.30	6.94	8.01	82	0.0	7.01		8.25
Dam	980518		1	22.52	6.91	7.93	80	0.0			
Dam	980518		2	19.48	6.9	8.67	78	0.0			
Dam	980518		3	17.96	6.87	9.5	76	0.0			
Dam	980518		4	15.19	6.83	9.32	75	0.0			
Dam	980518		5	12.82	6.74	9.66	74	0.0			
Dam	980518		6	10.43	6.68	10.3	75	0.0			
Dam	980518		7	8.08	6.57	9.11	75	0.0			
Dam	980518		8	7.21	6.46	6.57	75	0.0			
Dam	980518		9	6.69	6.45	4.49	75	0.0			
Dam	980518		10	6.46	6.47	4.03	76	0.0			
Dam	980518		11	6.30	6.56	3.58	79	0.0			
Dam	980518		12	6.28	6.56	3.52	79	0.0			
Dam	980518		13	6.27	6.66	3.21	79	0.5			
Dam	980518		14	6.24	6.71	3.12	79	0.9			
Dam	980518		15	6.23	6.71	2.9	80	1.1			
Dam	980518		16	6.21	6.75	2.47	80	3.4			
Dam	980518		17	6.20	6.75	0.75	80	13.2			
Dam	980518		18	6.20	6.82	0.21	81	26.1		18	
Mid	980518	1027	0	23.47	6.68	8.01	79	0.0	6.59		8.99
Mid	980518		1	22.99	6.76	8.1	79	0.0			
Mid	980518		2	21.48	6.62	8.9	78	0.0			
Mid	980518		3	18.40	6.61	9.96	77	0.0			
Mid	980518		4	15.59	6.65	10.6	73	0.0			
Mid	980518		5	13.52	6.69	10.82	74	0.0			
Mid	980518		6	10.72	6.71	11.35	75	0.0			
Mid	980518		7	9.02	6.61	9.11	74	0.0			
Mid	980518		8	7.96	6.55	8.69	75	0.0			
Mid	980518		9	7.22	6.32	4.88	75	0.0			
Mid	980518		10	6.80	6.18	4.17	75	0.0			
Mid	980518		11	6.66	6.15	3.58	76	0.0			
Mid	980518		12	6.48	6.12	3.63	76	0.0			
Mid	980518		13	6.32	6.16	2.95	78	0.0		13	
Upper	980518		0	23.79	6.65	8.07	78	0.0	5.51		9.2
Upper	980518		1	23.50	6.73	8.01	79	0.0			
Upper	980518		2	21.44	6.63	8.94	77	0.0			
Upper	980518		3	19.30	6.59	9.15	76	0.0			
Upper	980518		4	14.98	6.63	10.61	72	0.0			
Upper	980518		5	12.83	6.67	11.21	73	0.0			
Upper	980518		6	11.42	6.71	10.99	73	0.0			
Upper	980518		7	9.31	6.61	8.65	75	0.0			
Upper	980518		8	7.90	6.28	3.40	77	0.0			
Upper	980518		9	7.16	6.14	2.35	77	0.0			
Upper	980518		10	6.66	6.11	2.53	77	0.0		10	
Dam	980702	947	0	27.47	6.89	7.87	84	36.8	4.98		6.3

Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
			m	oC		ppm	µS		m	m	m
Dam	980702		1	27.41	6.81	7.92	82	0.0			
Dam	980702		2	26.95	6.76	7.74	78	0.0			
Dam	980702		3	22.93	6.57	8.99	75	0.2			
Dam	980702		4	18.89	6.45	7.00	75	1.0			
Dam	980702		5	15.86	6.35	5.97	80	0.6			
Dam	980702		6	12.60	6.32	6.39	80	0.3			
Dam	980702		7	10.34	6.28	6.72	80	0.4			
Dam	980702		8	8.53	6.23	6.34	80	0.3			
Dam	980702		9	7.65	6.14	4.52	81	0.2			
Dam	980702		10	7.15	6.06	2.42	81	0.6			
Dam	980702		11	6.82	6.02	1.49	82	1.1			
Dam	980702		12	6.69	6.00	1.03	82	0.7			
Dam	980702		13	6.57	6.00	0.54	83	1.1			
Dam	980702		14	6.51	6.00	0.15	84	4.0			
Dam	980702		15	6.47	6.00	0.08	86	4.9			
Dam	980702		16	6.43	6.04	0.06	96	4.3		16	
Mid	980702	1019	0	27.47	6.91	7.93	77	0.3	4.79		6.5
Mid	980702		1	27.36	6.74	8.07	76	0.0			
Mid	980702		2	27.06	6.66	8.00	76	1.0			
Mid	980702		3	23.08	6.73	10.35	70	0.9			
Mid	980702		4	20.52	6.70	9.87	69	1.3			
Mid	980702		5	16.74	6.53	8.65	72	0.9			
Mid	980702		6	13.27	6.44	7.38	75	0.9			
Mid	980702		7	10.33	6.25	5.57	77	0.3			
Mid	980702		8	9.06	6.17	4.79	77	0.5			
Mid	980702		9	7.99	6.09	2.39	78	0.8			
Mid	980702		10	7.51	6.03	1.09	79	1.1			
Mid	980702		11	7.07	6.01	0.46	79	2.6			
Mid	980702		12	6.89	6.01	0.23	80	2.5			
Mid	980702		12.9	6.74	6.11	0.10	89	14.0		12.9	
Upper	980702	1044	0	27.27	6.81	8.25	74	0.0	3.04		
Upper	980702		1	27.24	6.73	8.25	74	0.0			
Upper	980702		2	26.97	6.60	8.10	74	1.4			
Upper	980702		3	26.26	6.40	7.17	74	1.4			
Upper	980702		4	19.78	6.38	7.91	68	1.9			
Upper	980702		5	16.94	6.32	6.64	73	16.7		5	
Dam	980925	1556	0	24.00	6.74	7.63	78	0.0	5.89		8.7
Dam	980925		1	23.80	6.64	7.68	78	0.0			
Dam	980925		2	23.75	6.45	7.67	78	0.0			
Dam	980925		3	23.71	6.47	7.69	77	0.0			
Dam	980925		4	23.57	6.50	7.61	78	0.0			
Dam	980925		5	22.58	6.46	7.19	77	0.0			
Dam	980925		6	17.67	6.18	4.83	87	0.7			
Dam	980925		7	13.22	6.08	1.54	88	0.6			
Dam	980925		8	10.24	6.17	0.85	90	1.8			
Dam	980925		9	8.60	6.25	0.43	93	1.4			
Dam	980925		10	7.77	6.22	0.28	91	0.0			

Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
			m	oC		ppm	µS		m	m	m
Dam	980925		11	7.14	6.33	0.21	97	0.0			
Dam	980925		12	6.94	6.43	0.17	103	0.8			
Dam	980925		13	6.85	6.52	0.15	109	0.9			
Dam	980925		14	6.80	6.60	0.12	112	1.7			
Dam	980925		15	6.74	6.67	0.11	118	1.5			
Dam	980925		16	6.67	6.75	0.10	126	2.9			
Dam	980925		16.9	6.64	6.95	0.08	155	0.0		16.9	
Mid	980925		0	23.79	6.59	7.34	74	0.0	4.51		7.2
Mid	980925		1	23.76	6.56	7.55	74	0.0			
Mid	980925		2	23.61	6.43	7.60	74	0.0			
Mid	980925		3	23.50	6.45	7.66	74	0.0			
Mid	980925		4	23.40	6.45	7.57	74	0.0			
Mid	980925		5	22.74	6.34	6.70	74	0.2			
Mid	980925		6	19.34	6.11	3.60	82	0.1			
Mid	980925		7	13.09	6.10	2.06	84	0.9			
Mid	980925		8	10.74	6.18	0.96	85	0.1			
Mid	980925		9	9.05	6.21	0.61	86	1.6			
Mid	980925		10	8.27	6.35	0.43	94	3.6			
Mid	980925		11	7.50	6.45	0.30	97	1.4			
Mid	980925		12	7.03	6.69	0.20	114	26.5		12.8	
Upper	980925		0	23.65	6.45	7.30	72	0.0			
Upper	980925		1	23.60	6.43	7.40	73	0.0			
Upper	980925		2	23.50	6.44	7.54	73	0.3			
Upper	980925		3	23.41	6.45	7.51	73	0.4			
Upper	980925		3.6	23.38	6.48	7.50	72	8.6		3.6	
Dam	981017	1230	0	19.75	6.85	6.25	34	0.0	4.32		14.0
Dam	981017		1	19.73	6.65	6.22	34	0.0			
Dam	981017		2	19.71	6.54	6.44	34	0.0			
Dam	981017		3	19.70	6.56	6.59	34	0.9			
Dam	981017		4	19.70	6.62	6.63	34	0.7			
Dam	981017		5	19.69	6.71	6.68	34	1.2			
Dam	981017		6	19.04	6.61	6.91	34	1.6			
Dam	981017		7	13.30	6.32	7.41	36	1.4			
Dam	981017		8	10.26	6.21	6.78	36	2.0			
Dam	981017		9	9.16	6.18	6.40	37	1.9			
Dam	981017		10	7.97	6.15	5.86	37	1.4			
Dam	981017		11	7.14	6.11	5.35	37	2.6			
Dam	981017		12	6.67	6.08	4.92	37	3.1			
Dam	981017		13	6.43	6.08	4.70	37	2.7			
Dam	981017		14	6.20	6.01	4.09	38	2.8			
Dam	981017		15	6.17	5.94	3.56	38	3.1			
Dam	981017		16	6.09	5.90	3.10	39	3.5			
Dam	981017		17	6.05	5.88	2.70	39	6.2			
Dam	981017		18	5.99	5.86	2.24	40	7.1			
Dam	981017		18.6	6.00	5.80	1.73	42	33.4		18.6	
Upper	981017		0	20.17	6.84	6.35	34	0.0	4.26		13.0
Upper	981017		1	19.84	6.66	6.52	34	0.0			

Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
			m	oC		ppm	µS		m	m	m
Upper	981017		2	19.66	6.59	6.64	34	0.6			
Upper	981017		3	19.58	6.51	6.73	34	2.0			
Upper	981017		4	19.54	6.50	6.81	34	1.7			
Upper	981017		5	19.49	6.54	6.88	34	1.8			
Upper	981017		6	18.78	6.48	7.33	34	1.2			
Upper	981017		7	13.48	6.19	7.32	36	0.8			
Upper	981017		8	10.22	6.12	6.75	36	1.3			
Upper	981017		9	8.87	6.09	6.14	36	1.9			
Upper	981017		10	7.83	6.06	5.88	36	1.5			
Upper	981017		11	7.23	6.04	5.26	36	2.1			
Upper	981017		12	6.69	6.02	4.83	37	2.0			
Upper	981017		13	6.42	5.98	4.25	38	2.6			
Upper	981017		14	6.24	5.94	3.76	38	3.9			
Upper	981017		15	6.13	5.86	3.03	39	3.4			
Upper	981017		16	6.06	5.86	2.39	41	3.7			
Upper	981017		17	6.02	5.86	1.91	41	6.4			
Upper	981017		18	6.01	5.87	1.65	41	7.6			
Upper	981017		19	5.99	5.87	1.47	41	9.0			
Upper	981017		19.8	5.99	5.83	1.14	42	9.0		19.8	
Dam	980526	1425	0	24.51	7.39	8.38	40	0.0	2.60		8.7
Dam	980526		1	24.24	7.35	8.44	40	0.7			
Dam	980526		2	22.15	7.19	10.23	39	2.2			
Dam	980526		3	16.93	7.38	10.83	37	2.4			
Dam	980526		4	13.39	7.20	10.34	37	2.7			
Dam	980526		5	11.16	7.07	9.75	38	2.9			
Dam	980526		6	9.81	6.99	9.44	39	2.0			
Dam	980526		7	8.41	6.90	9.18	40	0.9			
Dam	980526		8	7.81	6.85	8.98	40	0.6			
Dam	980526		9	7.10	6.77	8.69	40	1.3			
Dam	980526		10	6.67	6.71	8.32	40	0.7			
Dam	980526		11	6.46	6.64	7.93	40	0.4			
Dam	980526		12	6.25	6.60	7.39	41	0.3			
Dam	980526		13	6.06	6.53	6.88	41	0.0			
Dam	980526		14	5.93	6.47	6.66	41	0.0			
Dam	980526		15	5.87	6.44	6.38	41	0.0			
Dam	980526		16	5.81	6.39	6.03	41	0.0			
Dam	980526		17	5.76	6.35	5.84	41	0.0			
Dam	980526		18	5.74	6.33	5.69	42	0.0			
Dam	980526		19	5.72	6.32	5.61	42	0.0			
Dam	980526		20	5.69	6.29	5.44	42	0.0			
Dam	980526		21	5.69	6.28	5.24	42	0.0			
Dam	980526		22	5.69	6.25	4.70	43	0.0			
Dam	980526		23	5.69	6.24	4.39	44	0.0		23	
Upper	980526		0	25.26	7.27	8.22	36	0.0	2.71		9.8
Upper	980526		1	24.57	7.31	8.38	36	0.6			
Upper	980526		2	21.91	7.28	10.28	36	1.2			
Upper	980526		3	17.84	7.41	11.10	35	1.1			

Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
			m	oC		ppm	µS		m	m	m
Upper	980526		4	13.15	7.18	10.66	34	1.5			
Upper	980526		5	10.99	7.08	10.21	36	1.1			
Upper	980526		6	9.06	7.02	9.95	37	0.5			
Upper	980526		7	7.62	6.97	9.51	38	0.0			
Upper	980526		8	7.10	6.89	9.13	38	0.0			
Upper	980526		9	6.83	6.80	8.71	38	0.0			
Upper	980526		10	6.47	6.71	8.31	38	0.7			
Upper	980526		11	6.34	6.66	8.10	38	0.0			
Upper	980526		12	6.11	6.58	7.88	38	0.0			
Upper	980526		13	6.01	6.56	7.55	38	0.0			
Upper	980526		14	5.91	6.52	7.31	38	0.0			
Upper	980526		15	5.84	6.48	7.13	38	0.0			
Upper	980526		16	5.78	6.46	7.00	38	0.0			
Upper	980526		17	5.71	6.42	6.66	39	0.0			
Upper	980526		18	5.68	6.40	6.52	39	0.0			
Upper	980526		19	5.65	6.37	6.33	39	0.0			
Upper	980526		20	5.62	6.33	6.19	39	0.0			
Upper	980526		21	5.61	6.31	6.07	39	0.0			
Upper	980526		22	5.59	6.28	5.76	39	0.0			
Dam	980822	800	0	27.32	7.41	7.82	37	0.9	4.32		9.8
Dam	980822		1	27.32	7.40	7.81	37	0.7			
Dam	980822		2	27.32	7.12	7.81	37	1.0			
Dam	980822		3	27.32	7.03	7.88	36	0.9			
Dam	980822		4	24.98	7.49	11.26	36	1.3			
Dam	980822		5	19.04	7.58	12.14	37	0.6			
Dam	980822		6	13.81	7.37	12.40	38	0.3			
Dam	980822		7	11.00	7.03	11.52	38	0.3			
Dam	980822		8	9.06	6.80	9.65	39	0.7			
Dam	980822		9	7.79	6.61	8.10	39	0.3			
Dam	980822		10	7.20	6.53	7.49	39	0.1			
Dam	980822		11	6.74	6.42	6.92	39	0.2			
Dam	980822		12	6.46	6.35	6.61	39	0.1			
Dam	980822		13	6.23	6.30	6.32	39	0.0			
Dam	980822		14	6.09	6.25	5.90	39	0.0			
Dam	980822		15	5.93	6.21	5.43	39	0.0			
Dam	980822		16	5.87	6.17	4.93	39	0.0			
Dam	980822		17	5.82	6.15	4.60	39	0.0			
Dam	980822		18	5.80	6.12	4.20	40	0.0			
Dam	980822		19	5.78	6.10	3.64	40	0.2			
Dam	980822		20	5.77	6.08	3.18	41	2.1			
Dam	980822		21	5.75	6.07	2.65	41	1.7			
Dam	980822		22	5.75	6.06	2.25	42	1.9			
Dam	980822		23	5.73	6.05	1.65	42	0.8			
Dam	980822		24	5.72	6.06	1.26	43	2.3			
Dam	980822		25	5.72	6.05	1.09	43	3.3		25	
Upper	980822		0	27.25	7.11	7.72	34	0.0	3.59		7.9
Upper	980822		1	27.24	7.10	7.75	34	0.0			

Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
			m	oC		ppm	µS		m	m	m
Upper	980822		2	27.25	7.03	7.78	34	0.0			
Upper	980822		3	27.24	6.39	7.79	34	0.0			
Upper	980822		4	26.29	6.71	9.11	34	7.9			
Upper	980822		5	19.01	7.60	12.03	36	4.7			
Upper	980822		6	13.78	6.97	11.61	36	2.0			
Upper	980822		7	10.81	6.69	10.39	36	0.3			
Upper	980822		8	8.80	6.51	8.59	37	0.9			
Upper	980822		9	7.98	6.45	7.86	36	0.0			
Upper	980822		10	7.15	6.37	7.24	37	0.3			
Upper	980822		11	6.70	6.29	6.67	37	0.0			
Upper	980822		12	6.42	6.25	6.30	38	0.0			
Upper	980822		13	6.25	6.22	5.57	38	0.0			
Upper	980822		14	6.09	6.16	5.28	38	0.0			
Upper	980822		15	6.00	6.12	4.83	39	0.0			
Upper	980822		16	5.93	6.11	4.46	39	0.0			
Upper	980822		17	5.87	6.10	4.07	40	0.0			
Upper	980822		18	5.83	6.09	3.50	40	0.0			
Upper	980822		19	5.84	6.07	3.05	40	0.0			
Upper	980822		20	5.82	6.07	2.46	41	2.2			
Upper	980822		21	5.82	6.09	1.85	43	5.0		21	
Dam	981017	1600	0	20.03	8.02	7.49	651	2.5	5.16		7.8
Dam	981017		1	19.38	8.03	7.51	657	0.5			
Dam	981017		2	19.26	8.05	7.41	660	1.0			
Dam	981017		3	19.10	8.08	7.36	662	1.2			
Dam	981017		4	19.03	8.10	7.27	665	0.5			
Dam	981017		5	19.00	8.12	7.20	668	0.5			
Dam	981017		6	18.94	8.13	7.18	670	1.3			
Dam	981017		7	16.42	8.14	9.11	613	5.8			
Dam	981017		8	12.72	7.82	8.11	612	2.0			
Dam	981017		9	10.58	7.41	5.09	613	1.9			
Dam	981017		10	9.05	7.30	3.91	611	1.3			
Dam	981017		11	8.15	7.27	3.33	614	3.4			
Dam	981017		12	7.95	7.25	2.98	612	2.3			
Dam	981017		13	6.78	7.22	2.42	612	1.4			
Dam	981017		14	6.56	7.20	2.05	610	1.8			
Dam	981017		15	6.31	7.16	1.67	613	1.0			
Dam	981017		16	6.30	7.15	1.45	614	0.9			
Dam	981017		17	6.12	7.13	1.21	620	0.7			
Dam	981017		18	6.06	7.12	1.03	620	0.6			
Dam	981017		19	6.05	7.11	0.90	623	0.8			
Dam	981017		20	6.00	7.08	0.78	630	2.3			
Dam	981017		21	5.99	7.07	0.63	634	1.2			
Dam	981017		22.2	6.02	7.06	0.54	635	74.1		22.2	
Upper	981017		0	20.42	8.12	7.26	672	0.0	5.90		10.0
Upper	981017		1	19.74	8.08	7.27	678	0.3			
Upper	981017		2	19.17	8.09	7.33	680	0.3			
Upper	981017		3	19.06	8.08	7.34	681	2.0			

Site	Date	Time	Depth m	Temp oC	pH	D.O. ppm	Cond. µS	FTU	Zsd m	Zmax m	Photic Zone m
Upper	981017		4	19.01	8.09	7.26	684	1.6			
Upper	981017		5	18.95	8.10	7.23	687	1.3			
Upper	981017		6	18.89	8.08	6.89	690	1.9			
Upper	981017		7	15.04	7.65	6.71	640	1.8			
Upper	981017		8	12.01	7.33	4.17	629	1.6			
Upper	981017		9	10.45	7.31	2.81	627	0.7			
Upper	981017		10	9.32	7.31	2.12	630	5.5			
Upper	981017		11	8.06	7.23	1.71	629	1.9			
Upper	981017		12	7.33	7.22	1.42	626	2.3			
Upper	981017		13	6.82	7.19	1.11	624	1.2			
Upper	981017		14	6.55	7.17	0.88	625	0.7			
Upper	981017		15	6.40	7.16	0.67	626	0.7			
Upper	981017		16	6.30	7.14	0.51	628	0.6			
Upper	981017		17	6.16	7.12	0.44	631	0.7		17	
Dam	980821	1434	0	26.59	8.43	7.89	695	0.0	4.54		7.9
Dam	980821		1	26.08	8.43	8.24	699	11.2			
Dam	980821		2	25.92	8.40	8.31	699	0.0			
Dam	980821		3	25.77	8.35	8.29	699	0.0			
Dam	980821		4	23.73	7.77	8.49	695	1.0			
Dam	980821		5	18.93	8.35	12.87	649	3.0			
Dam	980821		6	15.28	8.26	12.57	633	1.1			
Dam	980821		7	12.07	8.28	12.02	625	7.5			
Dam	980821		8	10.60	8.06	10.08	622	13.1			
Dam	980821		9	8.96	7.88	7.84	621	0.0			
Dam	980821		10	8.04	7.62	3.54	621	2.1			
Dam	980821		11	7.52	7.56	1.96	621	2.6			
Dam	980821		12	7.00	7.54	0.71	622	0.4			
Dam	980821		13	6.62	7.51	0.43	622	0.2			
Dam	980821		14	6.49	7.49	0.27	623	0.0			
Dam	980821		15	6.31	7.48	0.24	624	0.0			
Dam	980821		16	6.00	7.47	0.22	625	0.0			
Dam	980821		17	5.98	7.45	0.20	626	0.0			
Dam	980821		18	5.98	7.42	0.20	629	0.0			
Dam	980821		19	5.98	7.40	0.20	634	0.0			
Dam	980821		20	5.98	7.38	0.20	640	0.2			
Dam	980821		21	5.98	7.38	0.20	644	0.0			
Dam	980821		22	5.97	7.36	0.20	654	5.3			
Dam	980821		23	6.00	7.19	0.20	645	0.6		23	
Upper	980821		0	27.74	8.36	8.02	694	0.0	3.95		7.7
Upper	980821		1	26.22	8.36	8.63	701	5.9			
Upper	980821		2	25.97	8.32	8.63	702	0.0			
Upper	980821		3	25.78	8.32	8.56	703	0.0			
Upper	980821		4	24.00	7.77	8.04	734	0.0			
Upper	980821		5	19.88	7.69	10.49	664	0.0			
Upper	980821		6	14.73	7.95	10.53	644	6.4			
Upper	980821		7	12.45	7.61	5.01	642	3.1			
Upper	980821		8	10.27	7.44	1.90	642	5.9			

Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
			m	oC		ppm	µS		m	m	m
Upper	980821		9	8.93	7.41	0.90	631	1.1		9	
Upper	980528	1820	0	23.64	8.6	8.06	578	0	5.83		10.9
Upper	980528		1	23.26	8.54	8.65	600	0			
Upper	980528		2	21.73	8.27	10.4	712	0			
Upper	980528		3	17.96	8.30	12.58	711	0.0			
Upper	980528		4	15.05	8.31	12.10	671	0.2			
Upper	980528		5	13.28	8.41	11.80	641	0.0			
Upper	980528		6	11.02	8.59	12.78	609	0.0			
Upper	980528		7	9.41	8.54	11.60	593	0.0			
Upper	980528		8	8.05	8.28	9.05	592	0.3			
Upper	980528		9	7.56	8.04	6.14	593	8.8			
Upper	980528		10	7.22	7.83	3.34	592	3.6			
Upper	980528		11	6.67	7.73	2.13	592	1.1			
Upper	980528		12	6.48	7.68	1.24	592	2.3			
Upper	980528		13	6.20	7.60	0.50	590	3.7			
Upper	980528		14	6.07	7.58	0.18	590	5.2			
Upper	980528		15	5.98	7.56	0.14	594	0.0			
Upper	980528		16	5.95	7.54	0.11	596	0.0		16	
Dam	980528	1650	0	23.86	8.66	8.07	598	0.0	4.86		9.2
Dam	980528		1	23.84	8.60	8.24	600	0.0			
Dam	980528		2	20.24	8.60	12.83	633	0.0			
Dam	980528		3	17.99	8.51	12.29	637	0.0			
Dam	980528		4	15.09	8.47	11.81	636	0.0			
Dam	980528		5	12.63	8.55	12.19	613	0.0			
Dam	980528		6	10.99	8.82	14.54	598	0.0			
Dam	980528		7	9.27	8.93	15.93	590	0.0			
Dam	980528		8	8.03	8.65	12.46	593	0.0			
Dam	980528		9	7.30	8.30	9.42	596	0.0			
Dam	980528		10	6.91	8.04	6.73	598	2.5			
Dam	980528		11	6.62	7.92	5.08	597	2.3			
Dam	980528		12	6.35	7.80	2.88	597	4.3			
Dam	980528		13	6.09	7.70	1.02	598	11.1			
Dam	980528		14	5.92	7.63	0.34	599	9.3			
Dam	980528		15	5.86	7.60	0.27	600	8.3			
Dam	980528		16	5.81	7.59	0.20	602	2.2			
Dam	980528		17	5.76	7.60	0.14	604	0.0			
Dam	980528		18	5.75	7.60	0.11	604	0.0			
Dam	980528		19	5.73	7.60	0.09	606	0.0			
Dam	980528		23	5.72	7.53	0.07	616	0.0		23	
Upper	980521	1055	0	23.40	7.59	7.74	68	10	1.94		3.7
Upper	980521		1	22.77	7.4	7.39	68	3.2			
Upper	980521		2	16.89	7.02	7.51	60	14.1			
Upper	980521		3	13.74	6.91	6.04	63	9.6			
Upper	980521		4	11.35	6.89	5.53	76	11.2			
Upper	980521		4.8	10.37	6.89	5.37	100	10.6		4.8	
Dam	980521		0	23.79	7.1	7.96	68	2.6	1.68		3.4
Dam	980521		1	21.95	6.98	9.36	64	5.5			

Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
			m	oC		ppm	µS		m	m	m
Dam	980521		2	16.96	6.97	9.42	71	9.7			
Dam	980521		3	13.41	6.84	8.74	64	9.2			
Dam	980521		4	11.34	6.81	8	73	9.9			
Dam	980521		5	10.39	6.8	6.89	100	6.3			
Dam	980521		6	7.41	6.86	3.61	101	5.6			
Dam	980521		7	6.47	6.98	3.4	576	2.4			
Dam	980521		8	6.04	7.07	3.18	637	2.6			
Dam	980521		9	5.95	7.11	2.61	673	1.5			
Dam	980521		10	5.92	7.25	1.96	689	1.4			
Dam	980521		11	5.92	7.17	1.27	699	2.1			
Dam	980521		12.5	5.90	7.15	1.04	698	4.7		12.5	
Upper	980702	1400	0	26.81	7.01	7.22	179	0.1	2.22		4.92
Upper	980702		1	26.41	7.03	7.39	175	0.9			
Upper	980702		2	25.41	6.88	6.59	148	1.6			
Upper	980702		3	22.07	6.68	6.13	105	2.2			
Upper	980702		4	19.00	6.55	4.74	89	5.7			
Upper	980702		5	16.37	6.44	2.26	89	10.6			
Upper	980702		6	12.80	6.38	0.79	96	12.2			
Upper	980702		6.5	10.40	6.52	0.14	415	9		6.5	
Dam	980702		0	26.78	7.23	7.6	201	1.3	1.35		4.33
Dam	980702		1	26.38	7.18	7.65	197	1			
Dam	980702		2	25.74	7.19	7.12	280	1.9			
Dam	980702		3	25.52	7.27	7.24	284	2.9			
Dam	980702		4	18.10	6.87	5.01	104	8.2			
Dam	980702		5	16.02	6.67	3.99	98	7.2			
Dam	980702		6	12.57	6.59	1.78	95	16.7			
Dam	980702		7	8.44	6.68	1.23	507	3.1			
Dam	980702		8	7.01	6.79	0.84	544	2.3			
Dam	980702		9	6.55	6.85	0.83	588	1.4			
Dam	980702		10	6.32	6.89	0.38	607	1.3			
Dam	980702		11	6.27	6.91	0.09	623	1.1			
Dam	980702		12	6.23	6.94	0.03	627	81.4			
Dam	980925		0	23.34	8.05	7.36	597	5.9	1.35		4.3
Dam	980925		1	23.27	8.03	7.44	596	4.6			
Dam	980925		2	23.01	7.99	7.40	590	6.5			
Dam	980925		3	22.94	8.00	7.40	600	5.9			
Dam	980925		4	22.57	8.04	7.43	634	7.1			
Dam	980925		5	21.52	7.89	6.61	654	7.6			
Dam	980925		6	14.55	7.28	2.51	590	4.3			
Dam	980925		7	9.94	7.22	1.21	621	1.9			
Dam	980925		8	7.97	7.24	0.65	658	3.7			
Dam	980925		9	7.39	7.27	0.46	674	1.6		9	
Upper	980925		0	23.08	7.86	7.04	565	0.0	1.00		3.6
Upper	980925		1	22.96	7.89	7.06	568	10.1			
Upper	980925		2	22.85	7.86	6.99	565	8.1			
Upper	980925		3	22.74	7.81	6.81	561	9.1			
Upper	980925		4	22.49	7.72	6.45	553	11.1			

Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
			m	oC		ppm	µS		m	m	m
Upper	980925		5	22.32	7.50	5.07	584	39.0			
Upper	980925		5.8	19.57	7.28	3.27	554	58.6		5.8	
Mid	980528	1431	0	25.55	7.08	7.7	163	9.8	1.39		3.4
Mid	980528		1	23.94	7.11	8.37	171	3.8			
Mid	980528		2	18.07	7.20	9.62	160	4.3			
Mid	980528		3	13.89	6.93	1.61	178	2.1			
Mid	980528		4	12.23	6.85	0.22	204	3.5			
Mid	980528		4.5	11.73	6.91	0.11	232	8.6		4.5	
Dam	980528		0	25.08	7.19	8.14	169	4.6	1.62		3.79
Dam	980528		1	24.09	7.20	7.9	170	2.6			
Dam	980528		2	18.06	7.19	8.22	188	3.3			
Dam	980528		3	14.8	6.99	3.17	195	2.5			
Dam	980528		4	12.75	6.89	0.45	202	1.7			
Dam	980528		5	11.34	6.87	0.12	243	2.7		5	
Mid	980727		0	27.32	7.31	7.15	150	0	1.33		3.3
Mid	980727		1	27.12	7.4	7.67	152	2.9			
Mid	980727		2	26.59	7.07	6.35	152	5.2			
Mid	980727		3	23.64	6.8	1.83	156	9.2			
Mid	980727		4	18.11	6.72	0.54	194	10.7			
Mid	980727		4.69	14.52	6.81	0.23	244	19.5		4.69	
Dam	980727		0	27.83	7.35	7.61	146	0.2	1.15		3
Dam	980727		1	27.37	7.39	7.46	148	2.9			
Dam	980727		2	26.09	7.38	7.55	149	4.4			
Dam	980727		3	21.35	6.92	2.63	159	5.9			
Dam	980727		4	15.99	6.73	0.65	208	7.1			
Dam	980727		5	13.57	6.78	0.26	256	8.6			
Dam	980727		5.45	12.67	6.89	0.19	302	18.6		5.45	
Mid	980926	1100	0	19.1	6.66	2.06	176	0	1.54		3.1
Mid	980926		1	18.78	6.61	1.82	176	2.5			
Mid	980926		2	18.72	6.65	1.78	176	4.2			
Mid	980926		3	18.7	6.67	1.76	176	4.7			
Mid	980926		4	18.69	6.69	1.74	176	5.2			
Mid	980926		4.73	18.67	6.68	1.48	177	10.8		4.73	
Dam	980926		0	20.01	6.67	2.93	173	0	2.55		2.8
Dam	980926		1	18.92	6.57	2.38	172	2.4			
Dam	980926		2	18.79	6.6	2.11	172	3.3			
Dam	980926		3	18.77	6.64	1.99	172	3.3			
Dam	980926		4	18.75	6.66	1.80	173	3.6			
Dam	980926		5	18.65	6.67	1.62	175	3.1			
Dam	980926		5.8	15.99	7.03	0.26	524	45.4		5.8	
Mid	980519		0	26.70	8.65	11.33	320	0.0	1.56		3.1
Mid	980519		1	24.92	8.63	13.02	323	8.3			
Mid	980519		2	18.24	7.89	6.61	346	6.6			
Mid	980519		3	15.65	7.48	0.38	361	4.6			
Mid	980519		4	14.77	7.40	0.15	366	3.8			
Mid	980519		5	13.74	7.38	0.11	363	2.5			
Mid	980519		6	12.81	7.37	0.09	358	4.0			

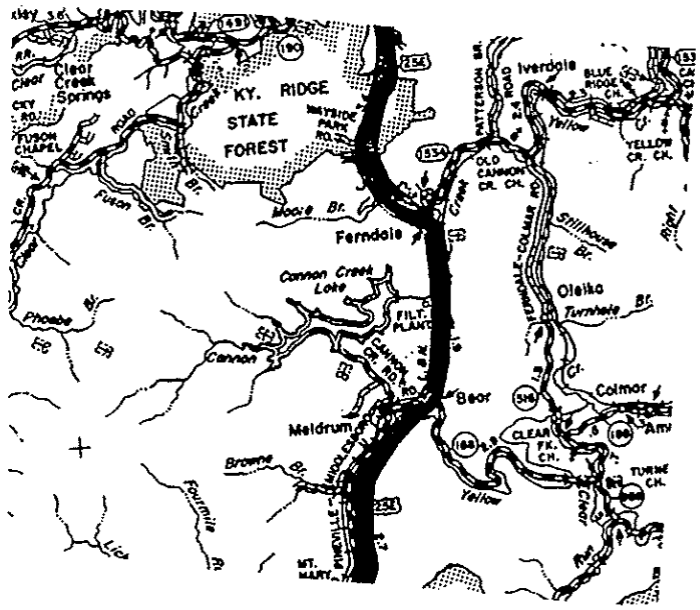
Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
			m	oC		ppm	µS		m	m	m
Mid	980519		6.5	12.39	7.37	0.06	365			6.5	
Dam	980519		0	27.01	8.22	11.01	304	0.0	1.42		3.9
Dam	980519		1	26.39	8.21	11.25	311	8.0			
Dam	980519		2	20.74	7.88	9.48	323	6.1			
Dam	980519		3	16.25	7.41	0.49	344	3.4			
Dam	980519		4	14.73	7.36	0.30	347	3.2			
Dam	980519		5	13.90	7.35	0.20	348	2.1			
Dam	980519		6	13.44	7.33	0.07	345	2.5			
Dam	980519		7	12.22	7.33	0.05	346	2.6			
Dam	980519		8	11.40	7.33	0.03	344	3.2			
Dam	980519		9	10.71	7.33	0.03	349	3.1			
Dam	980519		10	8.69	7.36	0.01	369				
Dam	980519		11.5	8.43	7.33	0.01	377			11.5	
Mid	980727	1025	0	26.38	9.05	11.55	230	33.9	0.41		1.9
Mid	980727		1	26.26	8.91	11.26	235	29.3			
Mid	980727		2	25.62	7.61	1.00	289	12.3			
Mid	980727		3	21.66	7.34	0.15	287	15.0			
Mid	980727		4	20.03	7.30	0.10	303	16.8			
Mid	980727		5	17.79	7.32	0.08	356	14.1			
Mid	980727		6	14.53	7.31	0.06	357	8.6			
Mid	980727		7	13.12	7.24	0.06	365	9.6			
Mid	980727		7.82	12.45	7.22	0.05	367	28.0		7.82	
Dam	980727		0	26.50	8.91	12.92	237	31.8	0.42		2.0
Dam	980727		1	26.10	8.31	9.23	258	25.3			
Dam	980727		2	25.64	7.64	2.71	288	11.4			
Dam	980727		3	22.15	7.41	1.01	295	14.9			
Dam	980727		4	20.07	7.32	0.38	315	15.9			
Dam	980727		5	17.65	7.31	0.23	359	11.9			
Dam	980727		6	14.43	7.29	0.16	359	8.9			
Dam	980727		7	13.23	7.27	0.13	360	7.5			
Dam	980727		8	12.24	7.23	0.11	364	5.4			
Dam	980727		9	11.89	7.22	0.09	366	6.3			
Dam	980727		10	11.35	7.19	0.08	370	7.0			
Dam	980727		11	10.85	7.17	0.07	375	10.4			
Dam	980727		11.4	10.63	7.16	0.07	380	51.9		11.4	
Mid	981016		0	20.96	7.57	5.37	269	0.0	1.01		3.1
Mid	981016		1	17.98	7.48	5.31	272	8.2			
Mid	981016		2	17.72	7.22	3.73	274	7.8			
Mid	981016		3	17.47	7.17	2.83	276	11.7			
Mid	981016		4	16.95	7.04	0.68	304	23.4			
Mid	981016		5	15.49	6.94	0.31	374	22.9			
Mid	981016		5.32	14.93	6.94	0.20	392	62.2		5.32	
Dam	981016		0	21.99	7.39	4.65	276	4.1	2.55		2.9
Dam	981016		1	18.76	7.57	5.51	275	7.3			
Dam	981016		2	17.74	7.36	4.58	275	7.2			
Dam	981016		3	17.52	7.23	3.66	276	7.2			
Dam	981016		4	17.28	7.09	1.74	290	15.3			

Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
			m	oC		ppm	µS		m	m	m
Dam	981016		5	14.57	6.97	0.76	379	7.9			
Dam	981016		6	13.35	6.93	0.44	387	6.1			
Dam	981017		7	12.71	6.90	0.30	394	5.7			
Dam	981018		8	12.07	6.87	0.20	400	5.1			
Dam	981019		9	11.57	6.84	0.15	406	5.9			
Dam	981020		10	11.08	6.77	0.12	429	7.2			
Dam	981021		10.2	10.91	6.74	0.10	442	21.3		10.2	
Dam	980521	1709	0	25.25	7.56	8.18	83	0.0	1.98		5.1
Dam	980521		1	20.16	7.30	9.59	82	1.0			
Dam	980521		2	15.06	7.28	9.27	80	3.8			
Dam	980521		3	11.59	7.20	8.40	81	3.6			
Dam	980521		4	9.61	7.16	8.34	88	3.9			
Dam	980521		5	7.75	7.15	8.35	97	2.5			
Dam	980521		6	6.44	7.15	8.17	100	1.5			
Dam	980521		7	5.96	7.12	7.83	103	1.4			
Dam	980521		8	5.58	7.05	6.47	112	1.7			
Dam	980521		9	5.36	7.00	5.68	119	1.4			
Dam	980521		10	5.29	6.96	4.89	125	1.4			
Dam	980521		11	5.25	6.90	4.07	130	1.4			
Dam	980521		12	5.30	6.85	2.65	137	1.2			
Dam	980521		13	5.41	6.80	0.52	150	2.8			
Dam	980521		13.8	5.49	6.89	0.29	171	14.8		13.8	
Dam	980705	1100	0	23.26	7.66	8.99	78	8.6	0.78		2.8
Dam	980705		1	20.62	7.65	9.27	71	17.5			
Dam	980705		2	17.83	7.15	6.98	72	45.4			
Dam	980705		3	16.62	6.86	4.66	81	72.2			
Dam	980705		4	12.48	6.79	5.13	94	40.5			
Dam	980705		5	8.73	6.79	5.92	101	13.5			
Dam	980705		6	7.44	6.76	6.06	103	11.4			
Dam	980705		7	6.60	6.72	5.51	107	8.9			
Dam	980705		8	6.12	6.65	4.68	112	8.2			
Dam	980705		9	5.82	6.57	3.55	118	6.5			
Dam	980705		10	5.58	6.52	1.80	125	6.5			
Dam	980705		11	5.55	6.48	0.45	135	7.2			
Dam	980705		12	5.62	6.47	0.18	154	9.4			
Dam	980705		13	5.69	6.48	0.12	175	7.1			
Dam	980705		14	5.81	6.54	0.09	199	3.7		14	
Dam	981016	1740	0	21.49	7.05	5.56	122	24.0	3.37		7.0
Dam	981016		1	18.32	6.94	5.67	120	0.2			
Dam	981016		2	18.45	6.92	5.72	119	0.0			
Dam	981016		3	17.95	6.95	5.79	119	0.1			
Dam	981016		4	17.72	6.97	5.81	118	0.0			
Dam	981016		5	15.94	6.45	3.89	109	0.8			
Dam	981016		6	10.92	6.43	3.47	111	0.1			
Dam	981016		7	9.02	6.41	2.87	115	0.2			
Dam	981016		8	7.32	6.40	1.59	119	0.0			
Dam	981016		9	6.88	6.40	1.21	123	0.7			

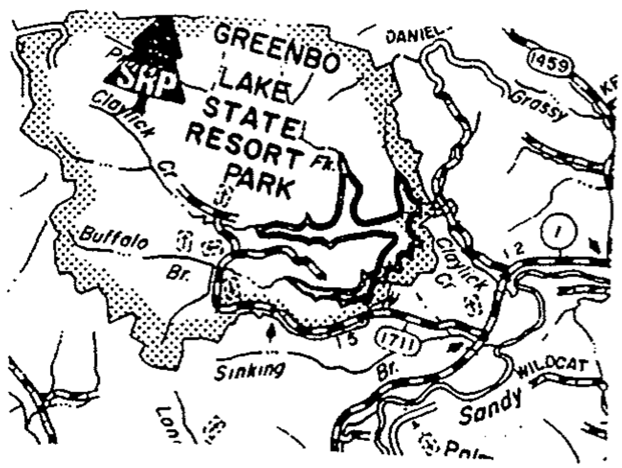
Site	Date	Time	Depth	Temp	pH	D.O.	Cond.	FTU	Zsd	Zmax	Photic Zone
			m	oC		ppm	µS		m	m	m
Dam	981016		10	6.46	6.46	0.94	142	0.5			
Dam	981016		11	6.17	6.58	0.75	168	2.4			
Dam	981016		12	6.15	6.66	0.59	182	3.4			
Dam	981016		13	6.19	6.71	0.47	205	4.2			
Dam	981016		13.2	6.26	6.73	0.37	234	3.1		13.2	
Dam	981016	930	0	18.63	7.21	7.40	62	2.7	3.4		7.0
Dam	981016		1	18.67	7.15	7.29	62	3.3			
Dam	981016		2	18.66	7.14	7.26	61	2.6			
Dam	981016		3	18.66	7.18	7.32	61	3.4			
Dam	981016		4	18.65	7.19	7.17	61	3.9			
Dam	981016		5	18.58	7.05	6.86	61	5.6			
Dam	981016		6	13.84	6.39	3.11	82	7.8			
Dam	981016		7	10.82	6.39	1.82	87	7.7			
Dam	981016		8	9.19	6.45	1.11	88	5.0			
Dam	981016		9	8.47	6.56	0.79	98	5.3			
Dam	981016		10	8.07	6.63	0.50	106	4.5			
Dam	981016		11	7.82	6.65	0.35	114	4.4			
Dam	981016		11.9	7.71	6.65	0.29	119	4.2		11.9	
Dam	980526	1130	0	23.71	7.60	8.54	73	0.4	3.35		5.6
Dam	980526		1	23.59	7.47	8.57	73	2.6			
Dam	980526		2	21.96	7.31	8.30	74	3.6			
Dam	980526		3	17.10	7.23	8.94	73	3.7			
Dam	980526		4	13.92	6.94	4.48	73	3.3			
Dam	980526		5	12.38	6.85	3.82	75	2.2			
Dam	980526		6	9.49	6.77	3.49	75	1.9			
Dam	980526		7	8.27	6.71	3.57	75	1.6			
Dam	980526		8	7.57	6.67	3.61	75	1.3			
Dam	980526		9	7.27	6.61	3.33	76	0.9			
Dam	980526		10	7.04	6.58	2.97	77	3.4			
Dam	980526		11	6.94	6.54	2.72	78	1.1			
Dam	980526		12	6.85	6.52	2.25	80	1.1			
Dam	980526		13	6.88	6.52	2.00	81	1.1			
Dam	980526		13.9	6.84	6.52	1.91	82	0.7		13.9	
Dam	980822	1142	0	27.43	7.71	7.89	62	0.9	3.35		5.6
Dam	980822		1	27.15	7.64	7.97	63	0.8			
Dam	980822		2	27.01	7.58	7.98	63	1.0			
Dam	980822		3	26.63	7.31	7.70	63	7.0			
Dam	980822		4	23.22	7.36	9.28	65	1.8			
Dam	980822		5	16.36	6.73	3.28	69	6.1			
Dam	980822		6	11.65	6.60	1.21	79	2.7			
Dam	980822		7	9.69	6.62	0.71	78	0.6			
Dam	980822		8	8.56	6.61	0.34	76	1.3			
Dam	980822		9	8.10	6.65	0.25	81	0.5			
Dam	980822		10	7.79	6.71	0.21	89	0.5			
Dam	980822		11	7.60	6.79	0.18	99	1.9			
Dam	980822		12	7.45	6.84	0.15	108	3.1			
Dam	980822		13	7.43	6.87	0.13	110	3.1		13	

APPENDIX D. SAMPLE LOCATIONS

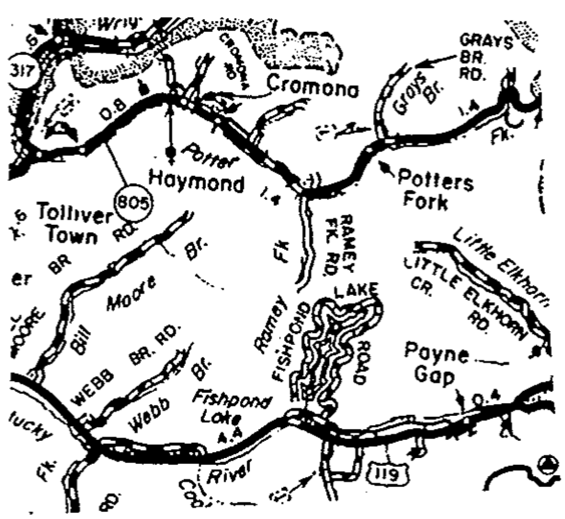
Cannon Creek Lake, Bell County



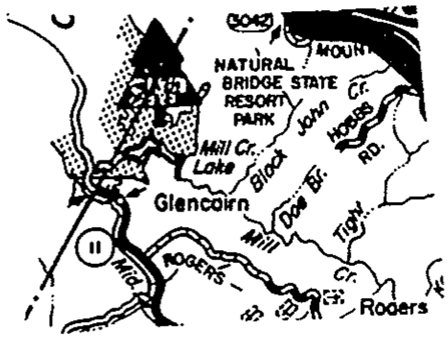
Greenbo Lake, Greenup County



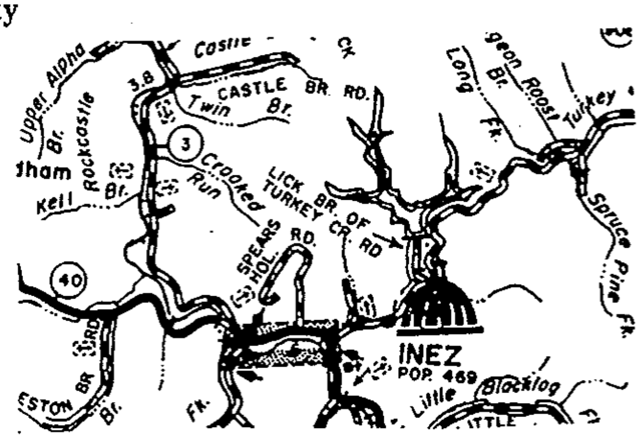
Fishpond Lake, Letcher County



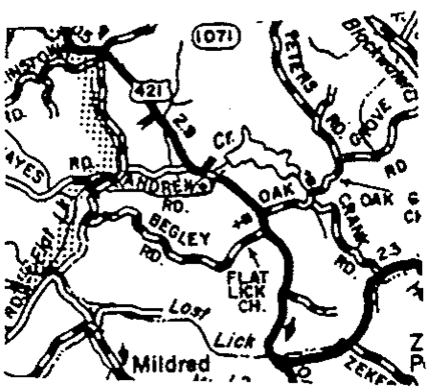
Mill Creek Lake, Wolfe County



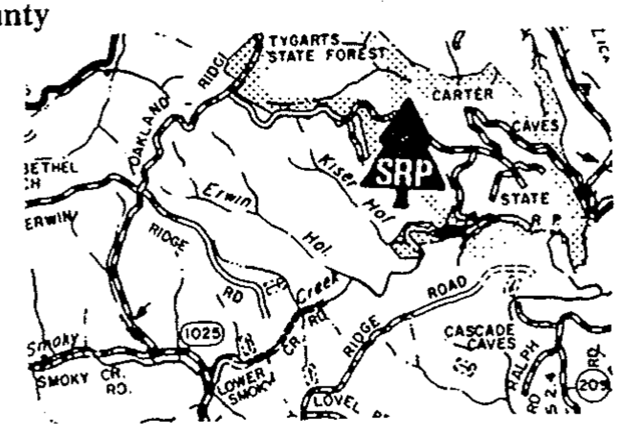
Curtis Crum Lake (Inez), Martin County



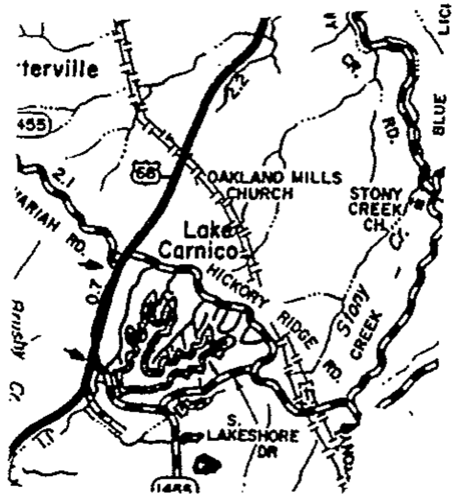
Tyner Reservior, Jackson County



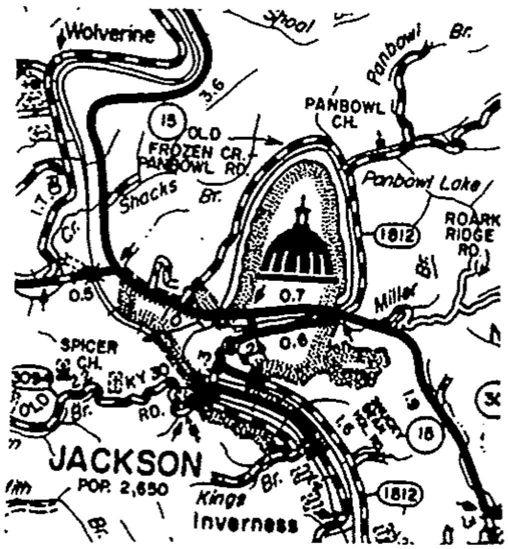
Carter Caves Lake (Smokey Valley), Carter County



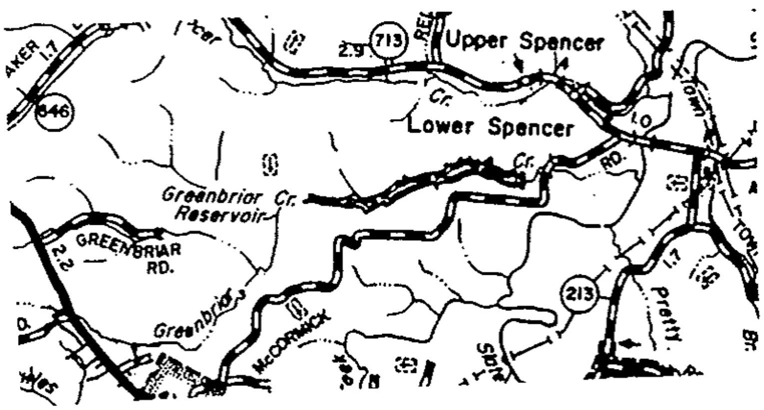
Lake Carnico, Nicholas County



Pan Bowl Lake, Breathitt County



Greenbriar Lake, Montgomery County



Fox Creek, Fleming County