BACTERIOLOGICAL AND BIOLOGICAL ASSESSMENT OF THE GREEN RIVER AND TRADEWATER RIVER WATERSHEDS

Final Report:

Project Period: July 1, 2001 - June 30, 2003

Project Number 00-07 (Bacteriological and Biological Monitoring of the Green River and Tradewater River Watersheds), per U.S.E.P.A. Section §319(h) Nonpoint Source Implementation Program Cooperative Agreement (#C9994861-00) and NREPC MOA-STATE-01 for FFY 2000 to:

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
KENTUCKY DEPARTMENT FOR ENVIRONMENTAL PROTECTION
KENTUCKY DIVISION OF WATER
14 REILLY RD.
FRANKFORT, KY 40601

Prepared by:

Scott A. Grubbs
Center For Biodiversity Studies
Western Kentucky University
Bowling Green, KY 42101
scott.grubbs@wku.edu

8 August 2003

Funding for this project Bacteriological and Biological Monitoring of the Green River and Tradewater River Watersheds was provided in part by a grant from the U.S. Environmental Protection Agency (USEPA) through the Kentucky Division of Water, Nonpoint Source Section, to Western Kentucky University as authorized by the Clean Water Act Amendments of 1987, §319(h) Nonpoint Source Implementation Grant #C9994861-00. The contents of this document do not necessarily reflect the views and policies of the USEPA, KDOW or Western Kentucky University nor does the mention of trade names or commercial products constitute endorsement. This document was printed on recycled paper."

Table of Contents

Acknowledgments

I need to signify the immense amount of work undertaken by Jason Taylor, who was responsible for coordinating and conducting the lion's share of field sampling and laboratory identifications of macroinvertebrates. Carrie Brooks was also instrumental with every phase of this project, and used the resulting data and subsequent analyses to fulfill her commitments towards earning a Master's of Science Degree at Western Kentucky University. Assistance with a variety of field and laboratory duties was provided by Mike Burchett, Joe Ferguson, Ben Hutchins, Brian Lewis, David Minnis, Robert O'Daniel, William Oliver, and Mike Romans. I am grateful to Greg Pond, Kentucky Division of Water (KDOW), for an endless seam of conversations and assistance with macroinvertebrate identifications. A number of additional KDOW personnel all provided assistance when needed, namely Terry Anderson, Gary Beck, Skip Call, Steve McMurray, Randy Payne, Rodney Pierce, Mike Reed, and Corinne Wells.

List of Tables

List of Figures

Executive Summary

A biological assessment using macroinvertebrates within a probabilistic monitoring strategy and a bacteriological assessment using fecal coliform bacteria of the Green River and Tradewater River Basins, Kentucky, U.S.A., was performed in conjunction with Standards and Specifications Section of the Kentucky Division of Water (KDOW). Thirty-five wadable stream sites, ranging in size from 1st to 6th order, were sampled for macroinvertebrates using a multihabitat approach between June and August 2001 from both high-gradient (= riffle-bearing) and low-gradient (= lacking riffles) reaches. The objective was to expand the number of probabilistic monitoring sites from 40 to 75 and use the resulting macroinvertebrate data to assess stream usage, extrapolate the results to cover the entire watershed, and estimate non-point source pollution impacts on streams throughout each basin. Fifty stream sites were monitored for fecal coliform bacteria from June through October 2001 to assess water quality conditions during the contact season. All sites were selected by KDOW personnel and were located at bridges. Fecal coliform analyses followed Standard Methods.

I. Introduction

Water quality in the Green River and Tradewater River Basins, Kentucky, U.S.A., has been historically monitored through a limited ambient monitoring program. The Kentucky Watershed Management Framework increased the number of monitoring sites within each basin in 2001. The Kentucky Division of Water (KDOW) has initiated, also under the watershed management approach, an effort to increase aquatic life use assessments in more streams. Several subbasins in the Green River and Tradewater River Basins are listed as high-priority, non-point source (NPS) impacted. The Green and Tradewater River Basins cover a large area and contain more streams than KDOW staff can monitor. In the summer of 2001 several agencies, including Western Kentucky University (WKU), collaborated on a watershed-scale bioassessment of both basins using macroinvertebrates and fecal coliform bacteria (FC)

Within the past several decades biological monitoring, or biomonitoring for short, has become a common method of assessing water quality of streams and rivers (Rosenberg and Resh, 1993). Physical and chemical parameters, such as pH, turbidity, and nutrient concentrations, are typically measured. Yet time- and point-specific data may not reveal water quality conditions averaged over longer temporal periods (i.e., one year) (Barbour et al., 1999). Therefore, biomonitoring is often preferred because of the ability of aquatic biota to assimilate cumulative effects of multiple environmental stressors (Ohio EPA, 1999). Biomonitoring using algae, fish or macroinvertebrates are relatively inexpensive and results may be obtained more quickly than by testing physical and chemical parameters (Barbour et al., 1999). Aquatic macroinvertebrates are particularly useful because they are ubiquitous, occur in large numbers, generally have a sedentary nature, exhibit relatively long life cycles, and they can be sampled with fairly simple and inexpensive equipments.

A variety of macroinvertebrate community data measures, or metrics, have been created to evaluate water quality. In theory, each metric should contribute relevant and necessary information about the stream quality of a site and be able to summarize data so that managers and other decision makers have an understanding of the health of the aquatic community (Barbour et al., 1992; Resh & Jackson, 1993). Environmental Protection Agency (EPA) rapid bioassessment protocols

(RBP) suggest 14 metrics as the “best candidate” metrics. These include measures of richness, composition, tolerance, feeding, and habitat. Each metric has been tested for its ability to distinguish stream impairments.

The specific purpose of this study was four-fold: (1) expand the number of probabilistic monitoring sites from 40 to 75 and use the resulting macroinvertebrate data to assess stream usage, extrapolate the results to cover the entire watershed, and estimate NPS impacts on streams throughout the study area. Probabilistic monitoring is a survey design by EPA for surveying non-tidal streams and rivers, and incorporating benthic macroinvertebrate sampling is one of the ways this is accomplished. The use of a restricted random sampling scheme can be expected to reflect environmental conditions throughout the basins; (2) determine recreational use support in targeted NPS-impacted subbasins and compare FC levels to non-NPS impacted subbasins, (3) attempt to pinpoint sources of NPS impacts, and (4) use FC data to determine if further sampling should be performed to develop swimming advisories.

II. Description of Study Area

General Description

The Green River and Tradewater River Basins drain 23,906 km^2 and 2,442 km^2, respectively, of the Interior Plateau and Interior Valley and Hills Level III Ecoregions. Both rivers drain into the Ohio River and each basin are impacted by a variety of land use practices including agriculture, coal mining, oil drilling, and forest and commercial use (Burr & Warren, 1986). The impact of these practices on stream quality within these basins has not been studied in great detail.

Macroinvertebrate Sampling Sites

In total, 35 wadable streams sites (Tables I-III) were sampled for benthic macroinvertebrates. Site selection was based on randomized coordinates derived from the E.P.A. EMAP database. However, because the probabilistic design included random sites that were either inaccessible or were dry at the planned time of sampling, these sites were removed and replaced with surrogate sites (Table IV). In particular, 21 high-gradient stream sites and 14 low-gradient stream sites were assessed by WKU using standard biomonitoring procedures according to KDOW Methods for Assessing Biological Integrity of Surface Waters (KDEP, 1993) and Barbour et al. (1999).

Fecal Coliform Bacteria Sampling Sites

Fifty stream sites (Table V) were selected for fecal coliform monitoring by KDOW personnel. All sites were located at bridges. Forty-seven sites were located in the Green River Basin, two sites in the Tradewater River Basin, and the remaining site (Canoe Creek) categorized as an Ohio River tributary. A global positioning system (Garmin Vista Etrex) was used to record sampling site coordinates in decimal degrees.

Table I. General location data for 35 stream sites in the Green River and Tradewater River Basins.

Basin	Stream name	Site code	County	Location
Green	Old Panther Creek	GRBOO-001	Daviess	3 km NE Moseleyville
	West Fork Pond River	GRBOO-004	Christian	4 km SE White Plains
	Indian Camp Creek	GRBOO-008	Butler	9 km N Morgantown
	Deer Creek	GRBOO-009	Webster	9 km NW Slaughters
	Little Muddy Creek	GRBOO-016	Butler	4 km SW Woodbury
	unnamed tributary to Wiggington Creek	GRBOO-022	Logan	7 km NW Auburn
	Bull Run	GRBOO-024	Ohio	7 km NE Rochester
	Deer Creek	GRBOO-025	Webster	7 km E Dixon
	Pond Creek	GRBOO-030	Muhlenberg	7 km S Greenville
	Deer Creek	GRBOO-035	Crittenden	6 km E Carrsville
	unnamed tributary to Pond Creek	GRBOO-036	Muhlenberg	4 km E Cleaton
	unnamed tributary to West Fork Lewis Creek	GRBOO-040	Ohio	5 km N Rockport
	Old Panther Creek	GRBOO-049	Daviess	2 km N Moseleyville
	East Fork Pond River	GRBOO-068	Christian	7 km N Kirkmansville
	Narge Creek	GRBOO-073	Hopkins	10 km SSW Jewel City
	Gilles Ditch	GRBOO-076	Daviess	6 km N Rome
	unnamed tributary to Flat Creek	GRBOO-087	Hopkins	5 km SE Madisonville
	unnamed tributary to Mays Run	GRBOO-088	Hardin	13 km SW Vine Grove
	West Fork Drakes Creek	GRBOO-089	Simpson	5 km NE Franklin
	Beaverdam Creek	GRBOO-097	Edmonson	4 km E Chalybeate
	Deer Creek	GRBOO-100	Webster	6 km SSW Sebree
	Bear Creek	GRBOO-102	Grayson	17 km SE Caneyville
	Sycamore Branch	GRBOO-103	Edmonson	5 km WNW Kyrock
	North Branch South Fork Panther Creek	GRBOO-104	Hancock	10 km SSE Fordsville
	Wolf Lick Creek	GRBOO-105	Logan	3 km NW Lewisburg
	South Fork Little Barren River	GRBOO-106	Metcalfe	8 km NNW Edmonton
	East Fork Little Barren River	GRBOO-109	Metcalfe	10.5 km SE Edmonton
	West Fork Pond River	GRBOO-111	Christian	7 km E Crofton
Tradewater	Tyson Branch Tradewater River	GRBOO-057	Caldwell	4 km E Shady Grove
	Piney Creek	GRBOO-061	Crittenden	10 km SE Marion
	Ward Creek	GRBOO-064	Caldwell	7 km E Princeton
Ohio River tributary	Crooked Creek	GRBOO-067	Crittenden	13 km E Tolu
	Highland Creek	GRBOO-069	Union	3 km W Uniontown
	Bayou Creek	GRBOO-110	Livingston	8 km N Birdsville
	Goose Pond Ditch	GRBOO-112	Union	16 km W Morganfield

Table II. Hydrologic and specific location data for 35 stream sites in the Green River and Tradewater River Basins. 71a = Interior Plateau (IP)/Crawford-Mammoth Cave Uplands; 71e = IP/Western Pennyroyal Karst Plain; 71g = IP/Eastern Highland Rim; 72a = Interior River Valley and Hills (IRVH)/ Wabash-Ohio Bottomlands; 72c = IRVH/Green River-Southern Wabash Lowlands; 72h = IRVH/ Caseyville Hills. See Table I for site code information. Sites organized as in Table I.

Site code	Latitude	Longitude	Level IV Ecoregion	Strahler Order	Distance to source (km)	Basin area (km^2)
GRBOO-001	37.6835	87.1791	72c	5	51.66	298.89
GRBOO-004	37.1361	87.3654	72c	5	33.25	46.28
GRBOO-008	37.3065	86.6902	72c	5	18.18	62.23
GRBOO-009	37.5464	87.5770	72c	5	15.34	41.74
GRBOO-016	37.1593	86.6610	72h	4	15.42	35.77
GRBOO-022	36.8733	86.7717	71a	3	5.28	10.56
GRBOO-024	37.2671	86.8597	72c	2	2.02	4.52
GRBOO-025	37.5065	87.6120	72c	5	15.47	41.92
GRBOO-030	37.1462	87.1601	72c	3	6.21	6.67
GRBOO-035	37.3976	88.3184	72a	5	25.49	63.39
GRBOO-036	37.2422	87.0649	72c	2	5.18	3.52
GRBOO-040	37.3777	87.0026	72c	1	1.44	0.53
GRBOO-049	37.6775	87.2049	72c	5	45.95	302.46
GRBOO-068	37.0710	87.2727	72h	5	44.74	148.64
GRBOO-073	37.4440	87.3878	72c	3	3.33	2.69
GRBOO-076	37.7681	87.1886	72a	3	5.34	2.53
GRBOO-087	37.2859	87.4298	72c	3	4.30	7.32
GRBOO-088	37.7391	86.0833	71a	3	2.14	5.22
GRBOO-089	36.7533	86.5489	71e	4	40.19	122.64
GRBOO-097	37.1218	86.1936	71a	3	4.62	4.89
GRBOO-100	37.5582	87.5451	72c	4	10.45	18.74
GRBOO-102	37.3617	86.3021	72h	4	23.20	57.77
GRBOO-103	37.2738	86.3128	72h	1	1.41	0.30
GRBOO-104	37.7299	86.7300	72h	4	11.46	13.00
GRBOO-105	37.0097	86.9644	71a	5	34.70	111.27
GRBOO-106	37.0430	85.6408	71g	4	32.02	78.63
GRBOO-109	36.9439	85.5011	71g	3	5.94	4.79
GRBOO-111	37.0543	87.4097	72h	5	14.56	32.16
GRBOO-057	37.3321	87.8410	72c	3	5.26	4.66
GRBOO-061	37.3044	87.9689	72h	5	11.94	11.33
GRBOO-064	37.1001	87.8070	71a	3	7.97	6.79
GRBOO-067	37.4312	88.0938	71a	4	32.82	40.97
GRBOO-069	37.7813	87.8933	72a	6	46.06	223.62
GRBOO-110	37.2872	88.4718	71a	4	21.65	35.69
GRBOO-112	37.6240	88.1305	72a	4	18.26	29.87

Table III. Characterization of 35 stream sites in the Green River and Tradewater River Basins as low- (= lacking riffles) or high- gradient (= with at least one natural riffle). See Table I for site code information. Sampling sites GRBOO-076 and higher were surrogate sites. Sites organized as in Table I.

Site code	High-gradient	Low-gradient
GRBOO-001		X
GRBOO-004	X	
GRBOO-008	X	
GRBOO-009		X
GRBOO-016		X
GRBOO-022	X	
GRBOO-024	X	
GRBOO-025	X	
GRBOO-030	X	
GRBOO-035		X
GRBOO-036	X	
GRBOO-040	X	
GRBOO-049	X	
GRBOO-068	X	
GRBOO-073		X
GRBOO-076		X
GRBOO-087	X	
GRBOO-088	X	
GRBOO-089	X	
GRBOO-097	X	
GRBOO-100		X
GRBOO-102	X	
GRBOO-103	X	
GRBOO-104		X
GRBOO-105		X
GRBOO-106	X	
GRBOO-109	X	
GRBOO-111		X
GRBOO-057		X
GRBOO-061		X
GRBOO-064	X	
GRBOO-067	X	
GRBOO-069		X
GRBOO-110	X	
GRBOO-112		X

Table IV. Location data and reasons for 28 stream sites not sampled for macroinvertebrates

Stream name	Site code	Latitude	Longitude	County	Reason
Brushy Fork	GRBOO-003	37.3826	88.0147	Crittenden	Dry
Hogan Slough	GRBOO-005	37.8712	87.8334	Henderson	Dry
unnamed tributary to Craborchard Creek	GRBOO-012	37.1652	87.4850	Hopkins	Dry
Twomile Creek	GRBOO-017	37.6011	87.0714	Daviess	Dry
unnamed tributary to Pond River	GRBOO-020	37.2438	87.3645	Muhlenberg	Inaccessible by foot/boat
Clear Fork	GRBOO-026	36.9728	86.6257	Warren	Landowner denied
unnamed tributary to Hurricane Creek	GRBOO-029	37.3456	88.1419	Crittenden	Dry
unnamed tributary to East Fork	GRBOO-032	37.1300	87.7866	Caldwell	Dry
unnamed tributary to Lick Creek	GRBOO-037	37.8125	87.4409	Henderson	Dry
unnamed tributary to Otter Creek	GRBOO-041	37.4583	87.4301	Hopkins	Dry
unnamed tributary to Clifty Creek	GRBOO-046	37.0118	87.0466	Logan	Dry
unnamed tributary to Piney Creek	GRBOO-048	37.0599	87.7056	Caldwell	Dry
unnamed tributary to Clear Creek	GRBOO-052	37.2809	87.5069	Hopkins	Dry
Hickory Camp Creek	GRBOO-056	37.1817	86.8147	Butler	Dry
Hazel Creek	GRB00-062	37.1427	87.0068	Muhlenberg	Landowner denied
unnamed tributary to East Fork Barren River	GRB00-086	36.7547	85.6531	Monroe	Dry
unnamed tributary to Casey Creek	GRB00-090	37.2585	85.1639	Adair	Dry
Little Claylick Creek	GRB00-091	37.1515	86.5892	Warren	Dry
unnamed tributary to Pond Drain	GRB00-092	37.4530	87.2384	McLean	Dry
unnamed tributary to South Fork Nolin River	GRB00-093	37.5216	85.7658	Larue	Dry
Cave Creek	GRB00-094	37.2542	88.5041	Pope (IL)	Dry
Jarrels Creek	GRB00-095	37.1409	87.2358	Muhlenberg	Dry
unnamed tributary to Muddy Gut Creek	GRB00-096	37.9497	86.7983	Hancock	Dry
Crooked Creek	GRB00-098	37.2598	85.1466	Adair	Dry
unnamed stream	GRB00-099	37.3327	86.9021	Ohio	Dry
unnamed tributary to Difficult Creek	GRB00-101	36.8356	86.1582	Allen	Dry
Sugar Creek	GRB00-107	37.1779	87.8163	Caldwell	Dry
unnamed stream	GRB00-108	37.4987	86.9415	Ohio	Dry

Table V. Sampling location of 50 FC stream sites. All stream sites were located in the Green River Basin except Greasy Creek (FC-T12), Tradewater River (FC-sta.no.50) (both in Tradewater River Basin) and Canoe Creek (FC-T02) (Ohio River tributary).

Site Code	Stream	County	Location	Latitude	Longitude
GRBEX-01	Glens Fork, Russell Creek	Adair	Rte. 55, 6 km SE Columbia	37.0520	-85.2643
GRBEX-02	Russell Creek	Adair	nr. Rte. 206, 1 km E Columbia	37.1053	-85.2883
GRBEX-03	Butlers Fork, Russell Creek	Adair	Rte. 80, Bliss	37.0810	-85.3725
GRBEX-04	Sulphur Creek	Adair	Taylors Ford Rd., 6 km ENE Columbia	37.1128	-85.2339
GRBEX-05	Pettys Fork, Russell Creek	Adair	Rte. 61, 3.5 km W Columbia	37.0974	-85.3340
GRBEX-06	Big Creek	Adair	Rte. 80, Gradyville	37.0624	-85.4295
GRBEX-07	Poplar Grove Branch	Taylor	Union Church Rd., 14 km SE Buffalo	37.4338	-85.5714
GRBEX-08	Upper Brush Creek	Green	Union Church Rd., 14 km SE Buffalo	37.4311	-85.5849
GRBEX-09	Big Reedy Creek	Butler	Rte. 238, 4 km NWN Roundhill	37.2725	-86.4431
GRBEX-10	Claylick Creek	Warren	Old Rte. 263, 3 km W Riverside	37.1556	-86.5722
GRBEX-11	Wolf Lick Creek	Logan	Duncan Ridge Rd., 3 km W Lewisburg	36.9872	-86.9953
GRBEX-12	Indian Camp Creek	Butler	U.S. 231, 9 km N Morgantown	37.2855	-86.7183
GRBEX-13	Bat East Creek	Muhlenberg	Rte. 1163, 8.5 km SE Greenville	37.1560	-87.0973
GRBEX-14	Plum Creek	Muhlenberg	U.S. 431/Rte. 70, 1 km NW Drakesboro	37.2318	-87.0512
GRBEX-15	Lewis Creek	Ohio	U.S. 62, 2 km NE Rockport	37.3475	-86.9843
GRBEX-16	Caney Creek	Grayson	Goffs-Neafus Rd., 10.5 km W Caneyville	37.4228	-86.6105
GRBEX-17	Caney Creek	Ohio	U.S. 62, 8 km ENE Rosine	37.4640	-86.6555
GRBEX-18	McGrady Creek	Ohio	Shiloh Rd., 16 km WNW Caneyville	37.4885	-86.6490
GRBEX-19	Muddy Creek	Ohio	Rte. 505, 19.5 km WNW Caneyville	37.5009	-86.6853
GRBEX-20	Deserter Creek	Daviess	nr. Deserter Creek Rd., 6 km SW Whitesville	37.6362	-86.9016
GRBEX-21	South Fork Panther Creek	Daviess	Rte. 762, 8.5 km SW Whitesville	37.6284	-86.9434
GRBEX-22	East Fork Pond River	Muhlenberg	Lone Star Rd., 7 km N Kirkmansville	37.0695	-87.2546
GRBEX-23	Buck Fork, East Fork Pond River	Christian	Froghop Rd., 5 km SW Kirkmansville	36.9925	-87.2986
GRBEX-24	Buck Creek	Christian	Rte. 189, 1 km E Fearsville	36.9813	-87.3522
GRBEX-25	Jarrels Creek	Muhlenberg	Greens Chapel Rd., 6 km SE White Plains	37.1573	-87.3171
GRBEX-26	E. Branch West Fork Pond River	Christian	Johnson Mille Rd., 7.5 km SE Crofton	37.0247	-87.4032
GRBEX-27	Elk Pond Creek	Muhlenberg	Greens Chapel Rd., 10.5 km WSW Greenville	37.1618	-87.2885
GRBEX-28	Craborchard Creek	Hopkins	U.S. 41, 4 km S Nortonville	37.1577	-87.4644
GRBEX-29	Pleasant Run	Hopkins	U.S. 41, Nortonville	37.1918	-87.4523
GRBEX-30	Flat Creek	Hopkins	Rte. 813, 3 km NE Mortons Gap	37.2506	-87.4547
FC-G51	Billy Creek	Hardin	Peterson Drive, Elizabethtown	37.6824	-85.8956
FC-G59	Valley Creek	Hardin	U.S.31W Bypass/U.S. 62, Elizabethtown	37.6901	-85.8671
FC-G60	Valley Creek	Hardin	Rte. 222, 3 km NW Glendale	37.6127	-85.9311
FC-T02	Canoe Creek	Henderson	nr. U.S. 41 ALT/U.S. 60, Henderson	37.8087	-87.6201
FC-T12	Greasy Creek	Hopkins	Rte. 262, 3 km W Madisonville	37.3352	-87.5332
FC-T25	Plum Creek	Muhlenberg	Rte. 70, 1 km E Browder	37.1983	-87.0316
FC-T34	Rough River	Ohio	Rte. 69, 2 km SW Hartford	37.4388	-86.9280
FC-T35	Mill Creek	Ohio	Rte. 54, 3 km W Fordsville	37.6364	-86.7566
FC-T36	Deserter Creek	Daviess	Rte. 764, 5 km SSW Whitesville	37.6465	-86.8835
FC-T37	South Fork Panther Creek	Ohio	Rte. 764, 8 km S Whitesville	37.6188	-86.8867
FC-T41	North Fork Panther Creek	Daviess	Rte. 142, 12 km NW Whitesville	37.7249	-86.9915
FC-T47	Knoblick Creek	Daviess	Berry Rd., 3 km SSE Curdsville	37.7117	-87.3205
FC-T48	Crooked Creek	Daviess	Crooked Creek Rd., 5 km SE Curdsville	37.7242	-87.2795
FC-sta.no.44	Pond River	Hopkins	Rte. 138/ Rte. 281, Jewel City	37.5272	-87.3542
FC-sta.no.45	Deer Creek	Webster	Rte. 370, 7 km SE Sebree	37.5730	-87.4651
FC-sta.no.46	Wolf Lick Creek	Logan	Iron Mountain Rd., 6 km N Lewisburg	37.0417	-86.9541
FC-sta.no.47	Mud River	Logan	Rte. 1153, 8.5 km NE Lewisburg	37.0486	-86.9060
FC-sta.no.48	Gasper River	Warren	U.S. 231, 1 km SE Hadley	37.0533	-86.5963
FC-sta.no.49	Russell Creek	Green	U.S. 68/Rte. 70, 4 km S Greensburg	37.2278	-85.5114
FC-sta.no.50	Tradewater River	Caldwell	U.S. 62, 1 km SW Dawson Springs	37.1608	-87.7040

III. Materials and Methods

Field Sampling: Macroinverbrates

At each site, the proportion of aquatic habitats within a 100-m reach of the stream was visually determined and sampling was based upon these habitats. For high gradient (riffle-bearing) sites, macroinvertebrate samples were collected from riffles using a 0.5 m^2 kick-seine with a mesh size of 800 x 900 μm. Two one-minute kick samples were collected from two separate riffles within the 100-m reach, composited, and rinsed through a 500-μm sieve. Large objects, such as twigs, leaves and rocks were washed, visually inspected and picked for macroinvertebrates, and removed from the sample.

The high gradient multihabitat sample was comprised of all remaining stream habitat types. If cobble to small boulder-sized rocks were present, 30 rocks were visually inspected and washed into a bucket with care to remove all organisms from the surface. If bedrock was present, a 500-μm mesh D-frame net was placed on the surface and a 0.1 m^2 area above the net was disturbed to detach organisms. This was completed three times and the samples were composited in a bucket. When undercut banks were present, the D-frame net was jabbed into the root mass and shaken vigorously in three different sections. At streams with the presence of *Justacia americana*, the D-frame net was jabbed into the plants in three 1-m sections. The same procedure was followed for other aquatic vegetation. For submerged wood, a total of 6 m in length, ranging between 5 and 25 cm in diameter, was inspected and washed into a bucket. Sediment was sampled by filling a 2-mm mesh sieve with sediment from three areas along the streambed. In addition, a 250-μm mesh sieve was dragged lightly along the streambed in three different places and these samples were added to the rest of the sediment sample.

At low gradient multihabitat sites, the proportion of each habitat type was visually determined within the 100-m reach. A total of 20 sample units were collected from available habitats based upon the proportion of the total habitat that they comprised. For each sample unit of submerged wood, undercut banks, and aquatic vegetation habitats, a D-frame net was thrust into the habitat for

approximately 1 m. If large cobble sized rocks were present, each rock was considered a sample unit and all organisms were picked from the surface and washed into a bucket. Sediment was collected and processed as described above with the high gradient sites. All samples from all habitats were preserved in 95% ethanol and later transferred to 70% ethanol.

Selected in-stream physical and chemical parameters were obtained with an YSI 6820 multiprobe sonde (Tables VI-VII). In-stream, stream bank, and riparian habitat features were quantified following standard EPA guidelines (Barbour et al., 1999) (Tables VIII-XI). Specifically, % sand, % silt, and % clay were combined into one variable (% fines).

Laboratory Methods: Macroinvertebrates

Riffle samples were full sorted at 7x magnification. Rock-pick, wood, undercut bank, sediment, bedrock and aquatic plant samples from both high-gradient multihabitat and low gradient sites were composited prior to sorting. Both sets of multihabitat samples were sorted using a fixed-count subsampling of 300 organisms at 7x. This method used a higher fixed-count value than the surveyed results found by Carter and Resh (2001) for EPA Region 4 and was a moderate value for the United States. All macroinvertebrates were identified to genus with the exceptions of Chironomidae, Hydracarina, and Oligochaeta and some damaged and juvenile individuals that could not be identified below family or order.

Data Analysis: Macroinvertebrates

Data were categorized into six groups based on taxonomic level (family, genus) and habitat (single habitat-riffle, multihabitat-all habitats excluding riffle, and low gradient-all habitats). All juvenile individuals that could not be identified to at least family level were removed from the analysis. Six metrics were calculated for each data group: taxa richness, Ephemeroptera, Plecoptera and Trichoptera (EPT) Richness, the modified Hilsenhoff Biotic Index (HBI), modified % EPT (minus Cheumatopsyche), and % Chironomidae+Oligochaeta, and % clingers. The tolerance values used to calculate the HBI were obtained from Barbour et al. (1999), Lenat

Table VI. Water chemistry data for 21 stream sites characterized as high-gradient. See Table I for site code information. n.a. = no data available.

Site code	pH	Conductivity
GRB00-004	7.36	271
GRB00-008	7.17	178
GRB00-022	7.24	163
GRB00-024	7.44	1308
GRB00-025	7.45	195
GRB00-030	7.39	340
GRB00-036	7.12	952
GRB00-040	7.22	164
GRB00-049	7.70	132
GRB00-064	6.97	193
GRB00-067	7.10	162
GRB00-068	7.33	211
GRB00-087	7.28	1123
GRB00-088	7.38	311
GRB00-089	7.52	300
GRB00-097	7.45	152
GRB00-102	7.35	220
GRB00-103	n.a.	n.a.
GRB00-106	7.57	283
GRB00-109	8.02	246
GRB00-110	7.48	152

Table VII. Water chemistry data for 14 stream sites characterized as low-gradient. See Table I for site code information. n.a. = no data available.

Site code	pH	Conductivity
GRB00-001	7.70	132
GRB00-009	7.51	201
GRB00-016	6.92	290
GRB00-035	7.17	178
GRB00-057	n.a.	n.a.
GRB00-061	7.45	167
GRB00-069	7.40	216
GRB00-073	7.35	393
GRB00-076	7.43	310
GRB00-100	7.51	201
GRB00-104	7.36	126
GRB00-105	7.31	223
GRB00-111	7.20	228
GRB00-112	6.48	181

Table VIII. Habitat data for 21 stream sites treated as high-gradient. See Table I for site code information. EpSb = epifaunal substrate/available cover; Emb = embeddedness; VlDp = velocity/depth regime; SdDp = sediment deposition; Chan = channel flow status; ChAl = channel alteration; FqBn = frequency of riffles; Stb-L = left bank stability; Stb-R = right bank stability; Prt-L = left bank vegetation protection; Prt-R = right bank vegetation protection; Rip-L = left bank riparian protection; Rip-R = right bank riparian protection. See Table I for site code information.

Site code	EpSb	Emb	VlDp	SdDp	Chan	ChAl	FqBn	Stb -L	Stb -R	Prt- L	Prt- R	Rip -L	Rip -R	TOTAL
GRB00-004	11	8	12	13	17	13	8	6	5	7	4	7	5	116
GRB00-008	11	13	13	12	15	13	5	5	4	6	5	4	4	110
GRB00-022	8	8	8	8	7	18	13	5	5	4	4	3	5	96
GRB00-024	6	8	8	13	14	13	18	9	9	9	9	7	7	130
GRB00-025	11	13	13	8	8	8	7	7	2	5	2	7	1	92
GRB00-030	9	13	9	7	9	10	9	5	5	4	4	2	2	88
GRB00-036	13	16	10	13	8	13	17	7	7	6	6	9	7	132
GRB00-040	9	14	6	7	8	20	8	7	7	7	7	9	9	118
GRB00-049	8	2	8	8	8	13	2	6	6	5	5	6	5	82
GRB00-064	13	18	13	15	8	18	10	9	9	9	9	6	7	144
GRB00-067	11	16	13	16	16	14	3	6	7	5	6	8	6	127
GRB00-068	13	18	13	13	7	13	13	8	8	7	7	3	4	127
GRB00-087	9	5	8	15	8	10	2	8	8	8	8	8	8	105
GRB00-088	10	11	12	8	10	18	15	4	4	5	5	4	4	110
GRB00-089	18	16	18	13	13	16	16	7	7	9	9	9	9	160
GRB00-097	14	15	13	18	13	18	18	8	7	8	7	3	4	146
GRB00-102		16	18	15	9	14	13	6	6	6	6	3	3	115
GRB00-103	9	18	10	15	13	18	19	6	7	4	5	1	6	131
GRB00-106	15	16	18	13	8	18	18	8	8	9	9	8	8	156
GRB00-109	10	20	7	19	8	18	5	9	9	9	9	2	2	127
GRB00-110	13	13	8	13	13		8	7	7	7	7	7	10	113

Table IX. Habitat data for 14 stream sites treated as low-gradient. See Table I for site code information. EpSb = epifaunal substrate/available cover; PlSb = pool substrate characterization; PlVr = pool variability = velocity/depth regime; SdDp = sediment deposition; Chan = channel flow status; ChAl = channel alteration; ChSn = channel sinuosity; Stb-L = left bank stability; Stb-R = right bank stability; Prt-L = left bank vegetation protection; Prt-R = right bank vegetation protection; Rip-L = left bank riparian protection; Rip-R = right bank riparian protection. See Table I for site code information.

Site code	EpSb	PlSb	PlVr	SdDp	Chan	ChAl	ChSn	Stb-L	Stb-R	Prt-L	Prt-R	Rip-L	Rip-R	TOTAL
GRB00-001	3	7	2	8	7	7	7	7	7	7	5	8	4	79
GRB00-009	6	7	7	8	12	10	5	3	3	3	3	3	1	71
GRB00-016	11	11	13	16	19	11	8	4	4	4	4	6	6	117
GRB00-035	10	12	13	16	19	17	8	5	5	6	6	9	9	135
GRB00-057	2	8	3	3	13	6	1	2	2	2	2	1	1	46
GRB00-061	10	7	10	10	15	10	5	2	2	3	3	5	2	84
GRB00-069	12	9	14	18	18	17	18	5	4	5	4	10	2	136
GRB00-073	3	6	3	5	0	6	1	3	3	5	5	2	2	44
GRB00-076	3	9	4	7	8	9	2	6	6	7	7	1	1	70
GRB00-100	6	7	7	8	12	10	5	4	4	5	5	5	2	80
GRB00-104	13	11	13	11	15	13	10	5	5	6	6	3	3	114
GRB00-105	6	7	13	18	18	13	5	6	6	5	5	7	5	114
GRB00-111	8	8	13	8	18	11	6	5	5	6	6	5	9	108
GRB00-112	3	8	3	3	8	6	3	4	4	6	6	1	4	59

Table X. Geomorphic characteristics for 21 stream sites characterized as high-gradient. See Table I for site code information. Bedr = bedrock, bldr= boulder, cobl = cobble, grvl = gravel. n.a. = no data available.

Site code	% riffle	% run	% pool	% bedr	% bldr	% cobl	% grvl	% sand	% silt	% clay
GRB00-004	5.0	30.0	65.0	0	0	15	22.5	0	7.5	55
GRB00-008	5.0	10.0	85.0	0	2.5	7.5	12.5	32.5	30	15
GRB00-022	22.5	45.0	32.5	0	0	0	37.5	57.5	5	0
GRB00-024	35.0	60.0	5.0	0	0	15	32.5	12.5	0	40
GRB00-025	5.0	10.0	85.0	0	0	12.5	25	50	10	2.5
GRB00-030	20.0	27.5	52.5	0	2.5	7.5	22.5	17.5	40	10
GRB00-036	37.5	35.0	27.5	0	0	27.5	47.5	15	10	0
GRB00-040	5.0	27.5	67.5	0	0	0	10	55	35	0
GRB00-049	5.0	45.0	50.0	0	0	0	0	10	90	0
GRB00-064	17.5	65.0	17.5	50	5	22.5	22.5	0	0	0
GRB00-067	10.0	22.5	67.5	0	0.5	9.5	22.5	10	25	32.5
GRB00-068	n.a.	n.a.	n.a.	35	2.5	17.5	5	0	40	0
GRB00-087	2.0	78.0	20.0	0	2.5	7.5	5	10	55	20
GRB00-088	15.0	47.5	37.5	0	2.5	27.5	20	5	45	0
GRB00-089	15.0	60.0	25.0	30	0	20	30	10	5	5
GRB00-097	27.5	27.5	45.0	22.5	2.5	57.5	15	2.5	0	0
GRB00-102	35.0	30.0	35.0	0	7.5	47.5	25	15	12.5	0
GRB00-103	67.5	32.5	0.0	0	0	57.5	17.5	15	10	0
GRB00-106	12.5	62.5	25.0	50	0	21.25	11.25	10	7.5	0
GRB00-109	7.5	82.5	10.0	47.5	0	20.15	17.65	11.75	2.95	0
GRB00-110	12.5	35.0	52.5	0	5	35	10	15	20	15

Table XI. Geomorphic characteristics for 14 stream sites characterized as low-gradient. See Table I for site code information. Bedr = bedrock, bldr= boulder, cobl = cobble, grvl = gravel.

Site code	% riffle	% run	% pool	% bedr	% bldr	% cobl	% grvl	% sand	% silt	% clay
GRB00-001	0.0	20.0	80.0	0	0	0	0	0	50	50
GRB00-009	0.0	82.5	17.5	0	0	1	2.5	70	26.5	0
GRB00-016	0.0	0.0	100.0	0	0	5	0	10	10	75
GRB00-035	0.0	0.0	100.0	0	0	0	0	0	20	80
GRB00-057	0.0	0.0	100.0	0	0	0	0	50	50	0
GRB00-061	0.0	0.0	100.0	0	0	0	0	10	40	50
GRB00-069	0.0	0.0	100.0	0	0	0	0	0	10	90
GRB00-073	5.0	15.0	80.0	2.5	0	2.5	7.5	0	0	87.5
GRB00-076	0.0	100.0	0.0	0	0	0	0	0	0	100
GRB00-100	0.0	75.0	25.0	0	0	0	0	75	12.5	12.5
GRB00-104	2.5	10.0	87.5	0	0	7.5	15	27.5	37.5	12.5
GRB00-105	0.0	0.0	100.0	0	0	0	0	30	30	40
GRB00-111	0.0	0.0	100.0	0	0	0	0	33.3	33.3	33.3
GRB00-112	0.0	100.0	0.0	0	0	5	0	30	35	30

(1993), and the KDOW Ecological Data Application System (EDAS (vKY3.0), 2001). Lastly, a multimetric macroinvertebrate index (MBI) was calculated for riffle and low-gradient data. The MBI incorporates each of the six equally-weighted metrics (Table XII).

To assess potential differences between sites both according to environmental parameters and macroinvertebrate assemblages, data were exposed to detrended correspondence analysis (DCA) (PC-ORD, Version 4.17 for Windows, MjM Software, 1999). Environmental data (Tables VI – XI) were left untransformed and macroinvertebrate data were transformed as log 1+x, where x = abundance of a taxon for a given composite sample. For the macroinvertebrate DCA, I chose to both include and downweight rare species. Macroinvertebrates that could not be identified below the level of family, but included individuals of that family taken to genus or species, were omitted.

Two DCA plots were prepared per analysis, one coding sites as either high-gradient or low-gradient, and the second coding sites as residing either within Level III Ecoregion 71 (Interior Plateau) or Ecoregion 72 (Interior River Valley and Hills). DCA was chosen because this ordination technique can handle large, complex datasets and uncover extremely long gradients. Species-site data are typically non-linear and unimodal and thus DCA is considered superior to other ordination techniques (e.g., Principal Components Analysis) when analyzing community data (McGarigal et al., 2000).

Canonical correspondence analysis (CCA) (PC-ORD, 1999) was used to address which environmental variables were attributable for potentially distinct macroinvertebrate assemblages. CCA (ter Braak 1986) ordinates a first matrix (by reciprocal averaging) and constrains it by a multiple regression on environmental variables (e.g., pH) within a second overlapping matrix. Due to a high degree of multicollinearity among geomorphic variables, % gravel and % fines were combined as one variable, and % cobble and % boulder were also consolidated as a single variable.

Table XII. Multimetric Biotic Index (MBI) scoring method for both genus- and family-level taxonomy. X = metric value, except for %Oligochaeta (= Y). Both GMBI and FMBI were calculated as the average of the six individual values. Individual values > 100 and < 0 are scored as 100 and 0, respectively, prior to calculation of MBI. %C+%O = % Chironomidae + % Oligochaeta, % Clng = % Clingers.

		Metric and scoring criteria					
Taxonomic level		Taxa richness	EPT richness	Modified HBI	Modified %EPT	%C+%O	%Clng
Genus (GMBI)	=	(X/65)*100	(X/31)*100	((10-X)/7.75)*100	(X/77)*100	((52-(X + Y))/51.1)*100	(X/74)*100
Family (FMBI)	=	(X/40.25)*100	(X/19.7)*100	((10-X)/6.56)*100	(X/77)*100	((52-(X + Y))/51.1)*100	(X/74)*100

Stream Usage Assessments

An assessment was performed for each sampling site as according to EPA-delineated guidelines 305(b) reporting for water quality (e.g., Appendix IV). The National Water Quality Inventory Report to Congress (305(b) report) is the primary vehicle for informing Congress and the public about general water quality conditions.

Field Sampling and Laboratory Analyses: FC Bacteria

Water samples were obtained monthly from June through October 2001. Samples were collected at bridges by hand-submerging a sterile Thomas Scientific clear plastic bottle and filling to the 100-ml mark. All bottles were immediately placed on ice in a cooler. Duplicate samples were obtained for 10% of all sites each month. Samples were returned to the Western Kentucky University Ogden Environmental Water Quality Laboratory and analyzed within six hours of the sample collection. All samples were analyzed by the Fecal Coliform Membrane Filter Procedure (Section 9222 D; APHA, 1998). Three appropriate dilutions of sample were filtered through 0.45-μm membrane filters and placed on mFC medium (agar or broth with nutrient pad) and incubated at 44.5°C for 22-26 hours. Blue colonies are counted as fecal coliforms and the counts of the three dilutions are averaged to produce a concentration reported in colony forming units per 100 mL.

Data Analysis: FC Bacteria

Because of the inherent variability of FC colony counts associated with discharge, precipitation data (Table 4) available through the U.S.G.S. (U.S.G.S., 2002) were obtained at locations on three different major rivers in the Green River Basin. This data reflected accumulated precipitation two days and four days prior to a given sampling event (Table XIII). Fecal coliform data was plotted as (a) number of sites that exceeded 2000 colonies per 100 ml, and (b) number of sites less than 200 colonies per 100 ml, against both the two- and four-day precipitation data.

Quality Assurance /Quality Control

Biological Assessment

All standard quality assurance/quality control (QA/QC) procedures, as outlined in APHA (1998) and KDOW Quality Assurance Guideline (1986), were followed. Selected and random WKU macroinvertebrate collections were examined by SSS personnel to ensure consistency with taxonomic identifications. The internal KDOW protocols and QA guidelines mentioned above are part of the then-approved EPA-approved Kentucky Department of Environmental Protection (DEP) QA/QC plan. A QA/QC plan had been submitted to the KDOW for approval. All monitoring activities that were conducted as part of this project were consistent with the approved QA/QC plan.

Bacteriological Assessment

All standard QA/QC procedures, as outlined in APHA (1998) and KDOW Quality Assurance Guidelines (1986), were followed. A duplicate number of samples (5, or 10%) were analyzed monthly. All data was submitted on a monthly basis. The internal KDOW protocols and QA guidelines mentioned above are part of the then-approved EPA-approved Kentucky Department of Environmental Protection (DEP) QA/QC plan. A QA/QC plan had been submitted to the KDOW for approval. All monitoring activities that were conducted as part of this project were consistent with the approved QA/QC plan.

Table XIII. Accumulated precipitation (in inches) at three U.S.G.S. stream flow locations two and four days prior to each monthly FC sampling period.

River	Station Number	Location	County	Latitude	Longitude	Month	2 d	4 d
Barren River	03314500	Bowling Green	Warren	37.0031	-86.4304	Jun	0.65	0.65
						Jul	0.00	0.00
						Aug	0.00	0.00
						Sept	0.00	0.00
						Oct	0.01	0.01
Green River	03311500	Lock & Dam # 6 2 km NE Brownsville	Edmonson	37.2062	-86.2608	Jun	0.59	0.59
						Jul	0.00	0.00
						Aug	0.01	0.01
						Sept	0.00	0.26
						Oct	0.01	0.01
Rough River	03318010	nr. Falls of Rough	Breckinridge	37.5896	-86.5517	Jun	0.77	0.77
						Jul	0.00	0.00
						Aug	0.32	0.32
						Sept	0.16	1.07
						Oct	0.00	0.00
Mean across three U.S.G.S. stations						Jun	0.67	0.67
						Jul	0.00	0.00
						Aug	0.11	0.11
						Sept	0.05	0.44
						Oct	0.07	0.07

IV. Results and Discussion

High-Gradient Sites: Green River Basin

The composite riffle sample of GRBOO-004 (West Fork Pond River) was dominated by individuals of two taxa (*Cheumatopsyche* sp. and *Stenelmis* sp), comprising 91% of the total sample (Appendix I). The multihabitat sample contributed an additional 8 taxa (*Palaemonetes* sp., *Hyalella azteca*, *Callibaetis* sp., *Choroterpes* sp., *Enallagma* sp., Corixidae, *Peltodytes* sp., and *Stratiomys* sp.; Appendix II). Both the individual metric scores and the MBI values are indicative of a stream of only fair water quality (Tables XIV-XV), yet designated as non-supportive according to the macroinvertebrate assemblage (Appendix III). This site was characterized by slightly alkaline pH (7.36; Table VI), moderate conductivity (271; Table VI), and a stream reach with a mediocre total habitat score (116; Table VIII) and with meager riffle coverage that was composed of cobble-gravel mix (Table X).

The composite riffle sample of GRBOO-008 (Indian Camp Creek) was dominated by four taxa (*Cheumatopsyche* sp., *Caecidotea* sp., Chironomidae, and *Stenelmis* sp.), comprising 94% of the total sample (Appendix IV). The multihabitat sample contributed an additional 10 taxa (Oligochaeta, *Hyalella azteca*, *Pisidium* sp., *Centroptilum* sp., *Caenis* sp., *Basiaeschna* sp., *Enallagma* sp., *Neurocordulia* sp., *Hydropsyche* sp., and *Bezzia/Palpomyia* sp.; Appendix V). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XIV-XV), and likewise designated as non-supportive according to the macroinvertebrate assemblage (Appendix VI). This site was characterized by slightly alkaline pH (7.17; Table VI), moderately-low conductivity (178; Table VI), and a stream reach with a mediocre total habitat score (110; Table VIII) and with meager riffle coverage that was composed of cobble-gravel-sand mix (Table X).

The composite riffle sample of GRBOO-022 (unnamed tributary to Wiggington Creek) was dominated by two taxa (Chironomidae and *Elimia* sp.), comprising 61% of the total sample (Appendix VII). The multihabitat sample contributed an additional 10 taxa (Cambaridae, *Baetis* sp., Gerridae, *Sialis* sp., Leptoceridae, *Lype diversa*, *Dubiraphia* sp., *Hygrotus* sp., *Atrichopogon*

Table XIV. Individual metric values and multimetric (G-MBI) index values at genus-level resolution for 21 stream sites characterized as high-gradient. See Table I for site code information. Values in bold represent individual components of the G-MBI.

Site code		Taxa Richness		EPT Richness			Modified HBI		Modified %EPT
GRB00-004	26	**40.00**	7	**22.58**	6.16	3.84	**49.51**	1.13	**1.47**
GRB00-008	19	**29.23**	5	**16.13**	6.15	3.86	**49.74**	2.27	**2.95**
GRB00-022	30	**46.15**	4	**12.90**	5.49	4.51	**58.17**	4.54	**5.90**
GRB00-024	22	**33.85**	5	**16.13**	6.24	3.76	**48.46**	11.98	**15.56**
GRB00-025	27	**41.54**	5	**16.13**	6.99	3.01	**38.86**	9.99	**12.97**
GRB00-030	15	**23.08**	1	**3.23**	6.11	3.89	**50.17**	0.00	**0.00**
GRB00-036	6	**9.23**	2	**6.45**	6.16	3.85	**49.61**	69.17	**89.83**
GRB00-040	18	**27.69**	2	**6.45**	7.21	2.79	**35.99**	0.43	**0.56**
GRB00-049	13	**20.00**	1	**3.23**	7.20	2.80	**36.18**	1.99	**2.58**
GRB00-064	28	**43.08**	4	**12.90**	6.65	3.36	**43.29**	5.32	**6.91**
GRB00-067	29	**44.62**	5	**16.13**	6.13	3.87	**49.96**	6.65	**8.64**
GRB00-068	27	**41.54**	12	**38.71**	5.33	4.67	**60.26**	24.66	**32.03**
GRB00-087	10	**15.38**	2	**6.45**	8.09	1.91	**24.63**	0.93	**1.21**
GRB00-088	33	**50.77**	7	**22.58**	5.20	4.80	**61.97**	9.47	**12.30**
GRB00-089	23	**35.38**	8	**25.81**	5.22	4.78	**61.63**	49.82	**64.70**
GRB00-097	43	**66.15**	16	**51.61**	5.29	4.71	**60.76**	3.12	**4.05**
GRB00-102	23	**35.38**	4	**12.90**	6.26	3.74	**48.31**	0.14	**0.18**
GRB00-103	15	**23.08**	1	**3.23**	6.74	3.26	**42.01**	0.00	**0.00**
GRB00-106	21	**32.31**	8	**25.81**	5.51	4.49	**57.96**	11.72	**15.22**
GRB00-109	28	**43.08**	9	**29.03**	5.88	4.12	**53.15**	4.10	**5.32**
GRB00-110	18	**27.69**	1	**3.23**	7.19	2.81	**36.25**	0.00	**0.00**
				%C+%O		%Clng		G-MBI	
GRB00-004	1.60	0.27	1.87	**98.11**	91.96	**100.00**		**51.94**	
GRB00-008	14.72	0.00	14.72	**72.95**	54.91	**74.20**		**40.87**	
GRB00-022	37.82	2.27	40.09	**23.31**	13.46	**18.19**		**27.44**	
GRB00-024	11.05	0.09	11.14	**79.96**	62.85	**84.93**		**46.48**	
GRB00-025	11.07	2.05	13.12	**76.09**	67.73	**91.53**		**46.19**	
GRB00-030	32.63	1.39	34.02	**35.19**	47.22	**63.81**		**29.24**	
GRB00-036	0.00	0.00	0.00	**100.00**	81.06	**100.00**		**59.19**	
GRB00-040	24.64	3.47	28.11	**46.75**	22.80	**30.81**		**24.71**	
GRB00-049	51.98	3.98	55.96	**0.00**	0.28	**0.38**		**10.40**	
GRB00-064	54.48	0.00	54.48	**0.00**	9.97	**13.47**		**19.94**	
GRB00-067	31.95	2.25	34.20	**34.83**	50.32	**68.00**		**37.03**	
GRB00-068	7.53	2.43	9.96	**82.27**	83.19	**100.00**		**59.13**	
GRB00-087	1.85	12.96	14.81	**72.78**	4.63	**6.26**		**21.12**	
GRB00-088	17.10	0.63	17.73	**67.06**	53.10	**71.76**		**47.74**	
GRB00-089	1.88	0.87	2.75	**96.39**	58.51	**79.07**		**60.50**	
GRB00-097	82.41	2.16	84.57	**0.00**	9.50	**12.84**		**32.57**	
GRB00-102	39.11	0.06	39.17	**25.11**	55.58	**75.11**		**32.83**	
GRB00-103	39.93	0.00	39.93	**23.62**	38.56	**52.11**		**24.01**	
GRB00-106	24.45	0.55	25.00	**52.84**	55.60	**75.14**		**43.21**	
GRB00-109	53.54	0.37	53.91	**0.00**	19.40	**26.22**		**26.13**	
GRB00-110	15.64	3.49	19.13	**64.32**	0.20	**0.27**		**21.96**	

sp., and *Chelifera* sp.; Appendix VIII). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XIV-XV) and likewise designated as non-supportive according to the macroinvertebrate assemblage (Appendix IX). This site was characterized by slightly alkaline pH (7.24; Table VI), moderately-low conductivity (163; Table VI), and a stream reach with a mediocre total habitat score (96; Table VIII) and with meager riffle coverage that was composed of gravel-sand mix (Table X).

The composite riffle sample of GRBOO-024 (Bull Run) was dominated by four taxa (*Cheumatopsyche* sp., *Hydropsyche* sp., Chironomidae and *Corbicula fluminea*), comprising 74% of the total sample (Appendix X). The multihabitat sample contributed an additional 8 taxa (*Lirceus* sp., *Tricorythodes* sp., *Argia* sp., *Sialis* sp., *Oecetis* sp., *Dubiraphia* sp., *Macronychus glabratus*, and *Dasyhelea* sp.; Appendix XI). Individual metric scores and the MBI values are indicative of a stream of fair water quality (Tables XIV-XV), yet designated as non-supportive according to the macroinvertebrate assemblage (Appendix XII). This site was characterized by moderately-alkaline pH (7.44; Table VI), high conductivity (1308; Table VI), and a stream reach with a mediocre total habitat score (130; Table VIII) and with meager riffle coverage that was composed of cobble-gravel-sand mix (Table X).

The composite riffle sample of GRBOO-025 (Deer Creek) was dominated by four taxa (*Stenelmis* sp., *Cheumatopsyche* sp., Chironomidae, and *Caenis* sp.), comprising 87% of the total sample (Appendix XIII). The multihabitat sample contributed an additional 9 taxa (*Dugesia* sp., *Pisidium* sp., *Callibaetis* sp., *Stenacron* sp., *Argia* sp., *Enallagma* sp., Libellulidae, Gerridae, and *Gyrinus* sp.; Appendix XIV). Individual metric scores and the MBI values are indicative of a stream of fair water quality (Tables XIV-XV), yet designated as non-supportive according to the macroinvertebrate assemblage (Appendix XV). This site was characterized by moderately-alkaline pH (7.40; Table VI), moderately-low conductivity (195; Table VI), and a stream reach with a mediocre total habitat score (92; Table VIII) and with meager riffle coverage that was composed of gravel-sand mix (Table X).

Table XV. Individual metric values and multimetric (F-MBI) index values at genus-level resolution for 21 stream sites characterized as high-gradient. See Table I for site code information. Values in bold represent individual components of the F-MBI.

Site code		Taxa Richness		EPT Richness			Modified HBI		Modified %EPT
GRB00-004	20	**49.69**	6	**30.46**	5.89	4.11	**62.65**	1.13	**1.47**
GRB00-008	16	**39.75**	4	**20.30**	5.53	4.47	**68.14**	2.27	**2.95**
GRB00-022	23	**57.14**	3	**15.23**	5.75	4.25	**64.79**	4.54	**5.90**
GRB00-024	19	**47.20**	4	**20.30**	5.96	4.04	**61.59**	11.98	**15.56**
GRB00-025	24	**59.63**	5	**25.38**	7.26	2.74	**41.77**	9.99	**12.97**
GRB00-030	15	**37.27**	1	**5.08**	6.04	3.96	**60.37**	0.00	**0.00**
GRB00-036	5	**12.42**	1	**5.08**	5.36	4.64	**70.73**	69.17	**89.83**
GRB00-040	18	**44.72**	2	**10.15**	7.26	2.74	**41.77**	0.43	**0.56**
GRB00-049	13	**32.30**	1	**5.08**	7.59	2.41	**36.74**	1.99	**2.58**
GRB00-064	23	**57.14**	3	**15.23**	7.18	2.82	**42.99**	5.32	**6.91**
GRB00-067	23	**57.14**	5	**25.38**	5.92	4.08	**62.20**	6.65	**8.64**
GRB00-068	23	**57.14**	9	**45.69**	5.12	4.88	**74.39**	24.66	**32.03**
GRB00-087	9	**22.36**	2	**10.15**	7.35	2.65	**40.40**	0.93	**1.21**
GRB00-088	26	**64.60**	5	**25.38**	5.30	4.70	**71.65**	9.47	**12.30**
GRB00-089	20	**49.69**	7	**35.53**	5.41	4.59	**69.97**	49.82	**64.70**
GRB00-097	32	**79.50**	12	**60.91**	5.60	4.40	**67.07**	3.12	**4.05**
GRB00-102	21	**52.17**	3	**15.23**	6.12	3.88	**59.15**	0.14	**0.18**
GRB00-103	12	**29.81**	1	**5.08**	5.95	4.05	**61.74**	0.00	**0.00**
GRB00-106	19	**47.20**	6	**30.46**	5.49	4.51	**68.75**	11.72	**15.22**
GRB00-109	24	**59.63**	7	**35.53**	6.05	3.95	**60.21**	4.10	**5.32**
GRB00-110	16	**39.75**	1	**5.08**	7.44	2.56	**39.02**	0.00	**0.00**
				%C + %O		%Clng		F-MBI	
GRB00-004	1.60	0.27	1.87	**98.11**	91.96	**100.00**		**57.06**	
GRB00-008	14.72	0.00	14.72	**72.95**	54.91	**74.20**		**46.38**	
GRB00-022	37.82	2.27	40.09	**23.31**	13.46	**18.19**		**30.76**	
GRB00-024	11.05	0.09	11.14	**79.96**	62.85	**84.93**		**51.59**	
GRB00-025	11.07	2.05	13.12	**76.09**	67.73	**91.53**		**51.23**	
GRB00-030	32.63	1.39	34.02	**35.19**	47.22	**63.81**		**33.62**	
GRB00-036	0.00	0.00	0.00	**100.00**	81.06	**100.00**		**63.01**	
GRB00-040	24.64	3.47	28.11	**46.75**	22.80	**30.81**		**29.13**	
GRB00-049	51.98	3.98	55.96	**0.00**	0.28	**0.38**		**12.85**	
GRB00-064	54.48	0.00	54.48	**0.00**	9.97	**13.47**		**22.62**	
GRB00-067	31.95	2.25	34.20	**34.83**	50.32	**68.00**		**42.70**	
GRB00-068	7.53	2.43	9.96	**82.27**	83.19	**100.00**		**65.25**	
GRB00-087	1.85	12.96	14.81	**72.78**	4.63	**6.26**		**25.52**	
GRB00-088	17.10	0.63	17.73	**67.06**	53.10	**71.76**		**52.12**	
GRB00-089	1.88	0.87	2.75	**96.39**	58.51	**79.07**		**65.89**	
GRB00-097	82.41	2.16	84.57	**0.00**	9.50	**12.84**		**37.40**	
GRB00-102	39.11	0.06	39.17	**25.11**	55.58	**75.11**		**37.82**	
GRB00-103	39.93	0.00	39.93	**23.62**	38.56	**52.11**		**28.73**	
GRB00-106	24.45	0.55	25.00	**52.84**	55.60	**75.14**		**48.27**	
GRB00-109	53.54	0.37	53.91	**0.00**	19.40	**26.22**		**31.15**	
GRB00-110	15.64	3.49	19.13	**64.32**	0.20	**0.27**		**24.74**	

The composite riffle sample of GRBOO-030 (Pond Creek) was dominated by three taxa (Chironomidae *Cheumatopsyche* sp., and *Stenelmis* sp.), comprising 79% of the total sample (Appendix XVI). The multihabitat sample contributed an additional 7 taxa (*Centroptilum* sp., *Stenonema* sp., *Boyeria* sp., *Hetaerina* sp., *Enallagma* sp., Libellulidae, and *Dubiraphia* sp.; Appendix XVII). Individual metric scores and the MBI values, combined with the fact that only 144 individuals were retrieved from the sample, are indicative of a stream of very poor water quality (Tables XIV-XV), and likewise designated as non-supportive according to the macroinvertebrate assemblage (Appendix XVIII). This site was characterized by moderately-alkaline pH (7.39; Table VI), moderate conductivity (340; Table VI), and a stream reach with a mediocre total habitat score (88; Table VIII) and with moderate riffle coverage that was composed mainly of cobble-gravel mix (Table X).

The composite riffle sample of GRBOO-036 (unnamed tributary to Pond Creek) was dominated by two taxa (*Hydropsyche* sp. and *Caecidotea* sp), comprising 87% of the total sample (Appendix XIX). The multihabitat sample failed to provide additional taxa (Appendix XX). Individual metric scores and the MBI values are indicative of a stream of fair water quality (Tables XIV-XV), yet designated as non-supportive according to the macroinvertebrate assemblage (Appendix XXI). This site was characterized by slightly-alkaline pH (7.12; Table VI), high conductivity (952; Table VI), and a stream reach with a mediocre total habitat score (132; Table VIII) and with meager riffle coverage that was composed of gravel-sand mix (Table X).

The composite riffle sample of GRBOO-040 (unnamed tributary to West Fork Lewis Creek) was dominated by three taxa (*Caecidotea* sp., Chironomidae and *Cheumatopsyche* sp.), comprising 86% of the total sample (Appendix XXII). The multihabitat sample contributed an additional 3 taxa (*Lirceus* sp., *Somatochlora* sp., and *Hydroporus* sp.; Appendix XXIII). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XIV-XV), and designated as non-supportive according to the macroinvertebrate assemblage (Appendix XXIV). This site was characterized by slighty-alkaline pH (7.22; Table VI), moderately-low conductivity (164; Table VI),

and a stream reach with a mediocre total habitat score (118; Table VIII) and with moderate riffle coverage that was composed mainly of gravel-sand mix (Table X).

The composite riffle sample of GRBOO-049 (Old Panther Creek) was dominated by two taxa (Chironomidae and *Lirceus* sp.), comprising 79% of the total sample (Appendix XXV). The multihabitat sample contributed an additional 3 taxa (*Caecidotea* sp., *Enallagma* sp., and *Tropisternus* sp.; Appendix XVIII). Individual metric scores and the MBI values are indicative of a stream of very poor water quality (Tables XIV-XV), and designated as non-supportive according to the macroinvertebrate assemblage (Appendix XXVII). This site was characterized by alkaline pH (7.70; Table VI), low conductivity (130; Table VI), and a stream reach with a poor total habitat score (82; Table VIII) and with meager riffle coverage that was composed mainly of sand mix (Table X).

The composite riffle sample of GRBOO-068 (East Branch Pond River) was dominated by four taxa (*Stenelmis* sp*., Cheumatopsyche* sp., *Chimarra* sp., and Chironomidae), comprising 89% of the total sample (Appendix XXXIV). The multihabitat sample contributed an additional 6 taxa (*Corbicula fluminea*, *Elimia* sp., *Caenis* sp., *Drunella* sp., *Enallagma* sp., and Corixidae; Appendix XXXV). Overall 11,000 individuals were sorted from the sample. Individual metric scores and the MBI values are indicative of a stream of fair water quality (Tables XIV-XV), yet designated as fully supportive according to the macroinvertebrate assemblage (Appendix XXXVI). This site was characterized by slightly-alkaline pH (6.97; Table VI), moderately-low conductivity (233; Table VI), and a stream reach with a mediocre total habitat score (127; Table VIII) and with moderate riffle coverage that was composed mainly of cobble (Table X).

The composite riffle sample of GRBOO-087 (unnamed tributary to Flat Creek) was dominated by three taxa (*Caecidotea* sp., *Hyalella azteca*, and Oligochaeta), comprising 85% of the total sample (Appendix XXXVII). The multihabitat sample contributed an additional 9 taxa (*Elimia* sp., *Pleurocera* sp., *Callibaetis* sp., *Argia* sp., *Macromia* sp., Corixidae, *Peltodytes* sp., *Berosus* sp. and *Tropisternus* sp.; Appendix XXXVIII). Individual metric scores and the MBI values, combined with the fact that only 108 individuals were retrieved from the sample, are indicative of a stream of very poor water quality (Tables XIV-XV), and designated as non-supportive according to the macroinvertebrate

assemblage (Appendix XXXIX). This site was characterized by slighty-alkaline pH (7.28; Table VI), high conductivity (1123; Table VI), and a stream reach with a mediocre total habitat score (105; Table VIII) and with a nearly-absent riffle that was composed mainly of cobble-gravel-sand mix (Table X)

The composite riffle sample of GRBOO-088 (unnamed tributary to Mays Run) was dominated by six taxa (*Sphaerium* sp., *Cheumatopsyche* sp., Chironomidae, *Nigronia* sp., *Optioservus* sp., and *Stenelmis* sp.), comprising 83% of the total sample (Appendix XL). The multihabitat sample contributed an additional 10 taxa (*Caecidotea* sp., *Pleurocera* sp., *Argia* sp., *Gomphus* sp., *Helicopsyche* sp., *Polycentropus* sp., *Lype diversa*, *Ancyronyx variegatus*, *Hydroporus* sp., and *Bezzia/Palpomyia* sp.; Appendix XLI). Individual metric scores and the MBI values are indicative of a stream of fair water quality (Tables XIV-XV), yet designated as fully supportive according to the macroinvertebrate assemblage (Appendix XLII). This site was characterized by moderately-alkaline pH (7.38; Table VI), moderate conductivity (311; Table VI), and a stream reach with a mediocre total habitat score (110; Table VIII) and with meager riffle coverage that was composed mainly of cobble-gravel mix (Table X).

The composite riffle sample of GRBOO-089 (West Fork Drakes Creek) was dominated by eight taxa (*Stenelmis* sp., *Stenonema* sp., *Isonychia* sp., *Cheumatopsyche* sp., *Baetis* sp., *Psephenus herricki*, *Caenis* sp., and *Corbicula fluminea*), comprising 90% of the total sample (Appendix XLIII). The multihabitat sample contributed an additional 16 taxa (Hydracarina, *Stenacron* sp., *Hetaerina* sp., *Enallagma* sp., Libellulidae, *Mesovelia* sp., *Micrasema* sp., *Trianodes* sp., *Nyctiophylax*, *Lype diversa*, *Ancyronyx variegatus*, *Dubiraphia* sp., *Macronychus glabratus*, *Peltodytes* sp., *Berosus* sp., and *Dixella* sp.; Appendix XLIV). Individual metric scores and the MBI values are indicative of a stream of fair water quality (Tables XIV-XV), yet designated as fully supportive according to the macroinvertebrate assemblage (Appendix XLV). This site was characterized by moderately-alkaline pH (7.52; Table VI), moderate conductivity (300; Table VI), and a stream reach with a good total habitat score (160; Table VIII) and with a meager riffle coverage that was composed mainly of cobble-gravel mix (Table X).

The composite riffle sample of GRBOO-097 (Beaverdam Creek) was dominated by Chironomidae, comprising 82% of the total sample (Appendix XLVI). The multihabitat sample contributed an additional 7 taxa (*Physella* sp., *Pleurocera* sp., *Argia* sp., *Munroessa/Synclita* sp., *Nyctiophylax* sp., *Psychomyia* sp., and *Ancyronyx variegatus*; Appendix XLVII). Individual metric scores, except for taxa richness, and the MBI values are indicative of a stream of fair water quality (Tables XIV-XV), yet designated as fully supportive according to the macroinvertebrate assemblage (Appendix XLVIII). This site was characterized by moderately-alkaline pH (7.45; Table VI), moderately-low conductivity (152; Table VI), and a stream reach with a good total habitat score (146; Table VIII) and with a moderate riffle coverage that was composed mainly of cobble-gravel mix (Table X). In addition, bedrock-dominated runs were a dominant geomorphic feature at this site. Taxa richness values were the highest recorded for all 35 sites at both genus-level (43) and family-level (32) taxonomy.

The composite riffle sample of GRBOO-102 (Bear Creek) was dominated by two taxa (*Cheumatopsyche* sp., and Chironomidae), comprising 94% of the total sample (Appendix XLIX). Overall 13,000 individuals were sorted from the sample. The multihabitat sample contributed an additional 12 taxa (*Dugesia* sp., Hydracarina, *Hyalella azteca*, *Stenonema* sp., *Stenacron* sp., *Enallagma* sp., *Mesovelia* sp., *Ancyronyx variegatus*, *Dubiraphia* sp., *Berosus* sp., *Tropisternus* sp., and Tabanidae; Appendix L). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XIV-XV), and likewise designated as non-supportive according to the macroinvertebrate assemblage (Appendix LI). This site was characterized by moderately-alkaline pH (7.35; Table VI), moderately-low conductivity (220; Table VI), and a stream reach with a mediocre total habitat score (115; Table VIII) and with a moderate riffle coverage that was composed mainly of cobble-gravel mix (Table X).

The composite riffle sample of GRBOO-103 (Sycamore Branch) was dominated by four taxa (Chironomidae*, Cheumatopsyche* sp., *Nigronia* sp., and *Limonia* sp.), comprising 86% of the total sample (Appendix LII). The multihabitat sample contributed an additional 8 taxa (*Procloeon* sp., Ephemerellidae, *Stenonema* sp., *Diplectrona modesta*, *Rhyacophila* sp., *Helocombus* sp.,

Atrichopogon sp., and *Dasyhelea* sp.; Appendix LIII). The two trichopteran taxa (*Diplectrona modesta* and *Rhyacophila*) suggest that this small stream is spring-fed through the summer months and supports at least a partial fauna of Appalachian components. Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XIV-XV), and designated as non-supportive according to the macroinvertebrate assemblage (Appendix LIV). This site was characterized by a stream reach with a mediocre total habitat score (131; Table VIII) and a cobble-dominated riffle (Table X). pH and conductivity were not obtained at this site.

The composite riffle sample of GRBOO-106 (South Fork Little Barren River) was dominated by four taxa (*Stenelmis* sp., Chironomidae, *Elimia* sp., *Cheumatopsyche* sp., and *Baetis* sp.), comprising 90% of the total sample (Appendix LV). The multihabitat sample contributed an additional 14 taxa (*Corbicula fluminea*, *Serratella* sp., *Hetaerina* sp., *Enallagma* sp., *Leuctra* sp., *Corydalus cornutus*, *Hydroptila* sp., *Oecetis* sp., *Cernotina* sp., *Ancyronyx variegatus*, *Dubiraphia* sp., *Macronychus glabratus*., *Berosus* sp., and *Bezzia/Palpomyia* sp.; Appendix LVI). Individual metric scores and the MBI values are indicative of a stream of fair water quality (Tables XIV-XV), yet designated as fully supportive according to the macroinvertebrate assemblage (Appendix LVII). This site was characterized by alkaline pH (7.57; Table VI), moderate conductivity (283; Table VI), and a stream reach with a good total habitat score (156; Table VIII) and with and meager riffle coverage that was composed mainly of cobble-gravel mix (Table X). In addition, bedrock-dominated runs were a dominant geomorphic feature at this site.

The composite riffle sample of GRBOO-109 (East Fork Little Barren River) was dominated by three taxa (Chironomidae, *Elimia* sp., and *Cheumatopsyche* sp.), comprising 84% of the total sample (Appendix LVIII). The multihabitat sample only contributed an additional 4 taxa (*Stenacron* sp., *Acroneuria* sp., *Neophylax* sp., and *Psychoda* sp.; Appendix LIX). Individual metric scores and the MBI values are indicative of a stream of fair water quality (Tables XIV-XV), and likewise designated as non-supportive according to the macroinvertebrate assemblage (Appendix LX). This site was characterized by alkaline pH (8.02; Table VI), moderate conductivity (246; Table VI), and a stream reach with a mediocre total habitat score (127; Table VIII) and with and meager riffle coverage that

were composed mainly of cobble-gravel-sand mix (Table X). In addition, bedrock-dominated runs were a dominant geomorphic feature at this site.

High-Gradient Sites: Tradewater River Basin

The composite riffle sample of GRBOO-064 (Ward Creek) was not dominated by any particular taxon, as only Chironomidae contributed more than 26 specimens (152, or 54%) to the total sample (Appendix XXVIII). The multihabitat sample contributed an additional 9 taxa (Oligochaeta, *Caecidotea* sp., *Helisoma* sp., *Pisidium* sp., *Stenacron* sp., *Boyeria* sp., *Somatochlora* sp., *Enallagma* sp., and *Ectopria nervosa*; Appendix XXIX). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XIV-XV), and likewise designated as non-supportive according to the macroinvertebrate assemblage (Appendix XXX). This site was characterized by circumneutral pH (6.97; Table VI), moderately-low conductivity (193; Table VI), and a stream reach with a moderately-high total habitat score (144; Table VIII) and with and meager riffle coverage that were composed mainly of cobble-gravel mix (Table X). In addition, bedrock-dominated runs were a dominant geomorphic feature at this site.

High-Gradient Sites: Ohio River Tributaries

The composite riffle sample of GRBOO-067 (Crooked Creek) was dominated by three taxa (Chironomidae, *Cheumatopsyche* sp., and *Stenelmis* sp.), comprising 80% of the total sample (Appendix XXXI). The multihabitat sample only contributed an additional 9 taxa (*Dugesia* sp., *Hyalella azteca*, *Physella* sp., *Pleurocera* sp., *Callibaetis* sp., *Centroptilum* sp., *Stenacron* sp., *Hydroptila* sp., and *Dineutus* sp.; Appendix XXXII), and likewise designated as non-supportive according to the macroinvertebrate assemblage (Appendix XXXIII). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XIV-XV). This site was characterized by circumneutral pH (7.10; Table VI), moderately-low conductivity (162; Table VI), and a stream reach with a mediocre total habitat score (127; Table VIII) and with and meager riffle

coverage that were composed mainly of cobble-gravel-sand mix (Table X). In addition, bedrock-dominated runs were a dominant geomorphic feature at this site.

The composite riffle sample of GRBOO-110 (Bayou Creek) was dominated by three taxa (*Sphaerium* sp., *Lirceus* sp., and Chironomidae), comprising 84% of the total sample (Appendix LXI). The multihabitat sample only contributed an additional 6 taxa (Cambaridae, *Crangonyx* sp., *Ferrissia* sp., *Amnicola* sp., *Peltodytes* sp., and *Pseudolimnophila* sp.; Appendix LXII). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XIV-XV), and likewise designated as non-supportive according to the macroinvertebrate assemblage (Appendix LXIII). This site was characterized by moderately-alkaline pH (7.48; Table VI), moderately-low conductivity (152; Table VI), and a stream reach with a mediocre total habitat score (121; Table VIII) and with and meager riffle coverage that were composed mainly of cobble-gravel mix (Table X).

Low-Gradient Sites: Green River Basin

The composite low-gradient sample of GRBOO-001 (Old Panther Creek) was dominated by two taxa (Chironomidae and Corixidae), comprising 95% of the total sample (Appendix LXIV). Individual metric scores and the MBI values are indicative of a stream of very poor water quality (Tables XVI-XVII), producing the lowest MBI score from the study, and likewise designated as non-supportive according to the macroinvertebrate assemblage (Appendix LXV). This site was

Table XVI. Individual metric values and multimetric (G-MBI) index values at genus-level resolution for 14 stream sites characterized as low-gradient. See Table I for site code information. Values in bold represent individual components of the G-MBI.

Site code		Taxa Richness		EPT Richness			Modified HBI		Modified %EPT
GRB00-001	11	**16.92**	1	**3.23**	7.76	2.25	**28.97**	0.21	**0.27**
GRB00-009	23	**35.38**	3	**9.68**	7.91	2.09	**26.99**	33.86	**43.97**
GRB00-016	24	**36.92**	4	**12.90**	6.86	3.14	**40.57**	17.69	**22.97**
GRB00-035	19	**29.23**	2	**6.45**	7.63	2.37	**30.54**	11.67	**15.16**
GRB00-057	23	**35.38**	5	**16.13**	7.01	2.99	**38.54**	5.11	**6.64**
GRB00-061	25	**38.46**	1	**3.23**	7.31	2.69	**34.67**	0.60	**0.78**
GRB00-069	26	**40.00**	5	**16.13**	7.05	2.95	**38.06**	5.61	**7.29**
GRB00-073	16	**24.62**	2	**6.45**	7.80	2.20	**28.44**	27.24	**35.38**
GRB00-076	23	**35.38**	1	**3.23**	7.76	2.24	**28.94**	0.23	**0.30**
GRB00-100	26	**40.00**	3	**9.68**	7.81	2.19	**28.22**	13.94	**18.10**
GRB00-104	22	**33.85**	4	**12.90**	6.31	3.69	**47.63**	16.07	**20.87**
GRB00-105	24	**36.92**	6	**19.35**	6.92	3.08	**39.73**	5.92	**7.69**
GRB00-111	23	**35.38**	3	**9.68**	6.62	3.38	**43.59**	1.94	**2.52**
GRB00-112	6	**9.23**	1	**3.23**	5.60	4.41	**56.84**	2.78	**3.61**
				%C + %O		%Clng		G-MBI	
GRB00-001	58.96	1.44	60.40	**0.00**	0.00	**0.00**		**8.23**	
GRB00-009	0.00	1.57	1.57	**98.69**	1.97	**2.66**		**36.23**	
GRB00-016	49.81	0.00	49.81	**4.29**	1.44	**1.95**		**19.93**	
GRB00-035	44.44	13.33	57.77	**0.00**	0.00	**0.00**		**13.56**	
GRB00-057	63.13	0.36	63.49	**0.00**	2.55	**3.45**		**16.69**	
GRB00-061	47.12	4.83	51.95	**0.10**	0.00	**0.00**		**12.87**	
GRB00-069	55.91	0.03	55.94	**0.00**	5.41	**7.31**		**18.13**	
GRB00-073	11.46	0.72	12.18	**77.93**	0.00	**0.00**		**28.80**	
GRB00-076	17.57	3.88	21.45	**59.78**	0.00	**0.00**		**21.27**	
GRB00-100	0.00	0.00	0.00	**101.76**	0.40	**0.54**		**33.05**	
GRB00-104	57.50	0.00	57.50	**0.00**	7.50	**10.14**		**20.90**	
GRB00-105	72.12	0.00	72.12	**0.00**	2.79	**3.77**		**17.91**	
GRB00-111	50.97	7.77	58.74	**0.00**	1.94	**2.62**		**15.63**	
GRB00-112	72.22	5.56	77.78	**0.00**	0.00	**0.00**		**12.15**	

characterized by alkaline pH (7.70; Table VII), low conductivity (132; Table VII), and a stream reach with a low total habitat score (79; Table XI).

The composite low-gradient sample of GRBOO-009 (Deer Creek) was not dominated by any particular taxon. The most abundant taxa (*Caenis* sp. and *Enallagma* sp.) only comprised 60% of the total sample (Appendix LXVI). The next two abundant taxa (*Palaemonetes* sp. and *Berosus* sp.) only

contributed 11%. Although the individual metric scores and the MBI values are indicative of a stream of only fair water quality (Tables XVI-XVII), this stream produced the highest MBI value for the low-gradient streams, yet was designated as non-supportive according to the macroinvertebrate assemblage (Appendix LXVII). This site was characterized by moderately-alkaline pH (7.51; Table VII), moderately-low conductivity (201; Table VII), and a stream reach with a low total habitat score (71; Table XI).

The composite low-gradient sample of GRBOO-016 (Little Muddy Creek) was dominated by four taxa (Chironomidae, *Caenis* sp., *Hyalella azteca*, and *Neurocordulia* sp.), comprising 84% of the total sample (Appendix LXVIII). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XVI-XVII), and likewise designated as non-supportive according to the macroinvertebrate assemblage (Appendix LXIX). This site was characterized by circumneutral pH (6.92; Table VII), moderate conductivity (290; Table VII), and a stream reach with a mediocre total habitat score (117; Table XI).

With the exception of *Caenis* sp. (26%), the composite low-gradient sample of GRBOO-073 (Narge Creek) was near-equally represented by five additional taxa (*Sphaerium* sp., *Physella* sp., *Argia* sp., Chironomidae, and *Berosus* sp.; 61%) (Appendix LXXVIII). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XVI-XVII), and likewise designated as non-supportive according to the macroinvertebrate assemblage (Appendix LXXIX). This site was characterized by moderately-alkaline pH (7.35; Table VII), moderate conductivity (393; Table VII), and a stream reach with a very poor total habitat score (44; Table XI). The habitat score is hardly surprising as this stream reach is channelized through a cornfield absent of a woody riparian zone.

Table XVII. Individual metric values and multimetric (F-MBI) index values at genus-level resolution for 14 stream sites characterized as low-gradient. See Table I for site code information. Values in bold represent individual components of the F-MBI.

Site code		Taxa Richness		EPT Richness			Modified HBI		Modified %EPT
GRB00-001	10	**24.84**	1	**5.08**	8.32	1.68	**25.61**	0.21	**0.27**
GRB00-009	19	**47.20**	3	**15.23**	7.79	2.21	**33.69**	33.86	**43.97**
GRB00-016	22	**54.66**	4	**20.30**	7.05	2.95	**44.97**	17.69	**22.97**
GRB00-035	17	**42.24**	2	**10.15**	7.98	2.02	**30.79**	11.67	**15.16**
GRB00-057	21	**52.17**	5	**25.38**	7.23	2.77	**42.23**	5.11	**6.64**
GRB00-061	21	**52.17**	1	**5.08**	7.53	2.47	**37.65**	0.60	**0.78**
GRB00-069	23	**57.14**	5	**25.38**	7.29	2.71	**41.31**	5.61	**7.29**
GRB00-073	14	**34.78**	2	**10.15**	8.19	1.81	**27.59**	27.24	**35.38**
GRB00-076	19	**47.20**	1	**5.08**	7.72	2.28	**34.76**	0.23	**0.30**
GRB00-100	23	**57.14**	3	**15.23**	7.77	2.23	**33.99**	13.94	**18.10**
GRB00-104	19	**47.20**	4	**20.30**	6.80	3.20	**48.78**	16.07	**20.87**
GRB00-105	21	**52.17**	6	**30.46**	7.25	2.75	**41.92**	5.92	**7.69**
GRB00-111	20	**49.69**	3	**15.23**	7.29	2.71	**41.31**	1.94	**2.52**
GRB00-112	6	**14.91**	1	**5.08**	7.03	2.97	**45.27**	2.78	**3.61**
				%C + %O		%Clng		F-MBI	
GRB00-001	58.96	1.44	60.40	**0.00**	0.00	**0.00**		**9.30**	
GRB00-009	0.00	1.57	1.57	**98.69**	1.97	**2.66**		**40.24**	
GRB00-016	49.81	0.00	49.81	**4.29**	1.44	**1.95**		**24.86**	
GRB00-035	44.44	13.33	57.77	**0.00**	0.00	**0.00**		**16.39**	
GRB00-057	63.13	0.36	63.49	**0.00**	2.55	**3.45**		**21.64**	
GRB00-061	47.12	4.83	51.95	**0.10**	0.00	**0.00**		**15.96**	
GRB00-069	55.91	0.03	55.94	**0.00**	5.41	**7.31**		**23.07**	
GRB00-073	11.46	0.72	12.18	**77.93**	0.00	**0.00**		**30.97**	
GRB00-076	17.57	3.88	21.45	**59.78**	0.00	**0.00**		**24.52**	
GRB00-100	0.00	0.00	0.00	**100.00**	0.40	**0.54**		**37.50**	
GRB00-104	57.50	0.00	57.50	**0.00**	7.50	**10.14**		**24.55**	
GRB00-105	72.12	0.00	72.12	**0.00**	2.79	**3.77**		**22.67**	
GRB00-111	50.97	7.77	58.74	**0.00**	1.94	**2.62**		**18.56**	
GRB00-112	72.22	5.56	77.78	**0.00**	0.00	**0.00**		**11.48**	

The composite low-gradient sample of GRBOO-076 (Gilles Ditch) was dominated by five taxa (*Physella* sp., Chironomidae, *Pisidium* sp., *Sphaerium* sp., and *Enallagma* sp.), comprising 79% of the total sample (Appendix LXXX). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XVI-XVII), and likewise designated as non-supportive according to the macroinvertebrate assemblage (Appendix LXXXI). This site was characterized by moderately-alkaline pH (7.43; Table VII), moderate conductivity (310; Table VII), and a stream reach with a poor total habitat score (70; Table XI).

The composite low-gradient sample of GRBOO-100 (Deer Creek) was not dominated by any particular taxon. The most abundant taxa (*Enallagma* sp. and *Physella* sp.) only comprised 47% of the total sample (Appendix LXXXII). This site supported the highest taxa richness at both genus- and family-level taxonomy, and the second highest MBI scores. This is not surprising as this site was located approximately one kilometer downstream of GRBOO-009. However, the individual metric scores and the MBI values are indicative of a stream of only fair water quality (Tables XVI-XVII), and designated as non-supportive according to the macroinvertebrate assemblage (Appendix LXXXIII). This site was characterized by moderately-alkaline pH (7.51; Table VII), moderately-low conductivity (201; Table VII), and a stream reach with a poor total habitat score (80; Table XI).

With the exception of Chironomidae (58%), the composite low-gradient sample of GRBOO-104 (North Branch South Fork Panther Creek) was near-equally represented by three additional taxa (*Caenis* sp., *Stenonema* sp., and *Helisoma* sp.; 20%) (Appendix LXXXIV). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XVI-XVII), and designated as non-supportive according to the macroinvertebrate assemblage (Appendix LXXXV). This site was characterized by moderately-alkaline pH (7.36; Table VII), low conductivity (126; Table VII), and a stream reach with a mediocre total habitat score (114; Table XI).

With the exception of Chironomidae (72%), the composite low-gradient sample of GRBOO-105 (Wolflick Creek) was near-equally represented by three additional taxa (Corixidae*, Caenis* sp., and *Hyalella azteca*.; 12%) (Appendix LXXXVI). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XVI-XVII), and designated as non-supportive

according to the macroinvertebrate assemblage (Appendix LXXXVII). This site was characterized by moderately-alkaline pH (7.31; Table VII), moderately-low conductivity (223; Table VII), and a stream reach with a mediocre total habitat score (114; Table XI).

With the exception of Chironomidae (51%), the composite low-gradient sample of GRBOO-111 (West Fork Pond River) was near-equally represented by four additional taxa (Neurocordulia sp., *Sialis* sp., Oligochaeta, and *Culicoides* sp.; 33%) (Appendix LXXXVIII). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XVI-XVII), and designated as non-supportive according to the macroinvertebrate assemblage (Appendix LXXXIX). This site was characterized by moderately-alkaline pH (7.20; Table VII), moderately-low conductivity (228; Table VII), and a stream reach with a mediocre total habitat score (108; Table XI).

Low-Gradient Sites: Tradewater River Basin

The composite low-gradient sample of GRBOO-057 (Tyson Branch) was dominated by three taxa (Chironomidae, Corixidae, and *Palaemonetes* sp.), comprising 88% of the total sample (Appendix LXXII). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XVI-XVII), and designated as non-supportive according to the macroinvertebrate assemblage (Appendix LXXIII). This site was characterized by a stream reach with a very poor total habitat score (46; Table XI). pH and conductivity were not obtained at this site.

The composite low-gradient sample of GRBOO-061 (Piney Creek) was dominated by six taxa (Chironomidae, *Sigara* sp., *Sialis* sp., *Pisidium* sp., Oligochaeta, and *Sphaerium* sp.), comprising 85% of the total sample (Appendix LXXIV). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XVI-XVII), and designated as non-supportive according to the macroinvertebrate assemblage (Appendix LXXV). This site was characterized by moderately-alkaline pH (7.45; Table VII), moderately-low conductivity (167; Table VII), and a stream reach with a poor total habitat score (84; Table XI).

Low-Gradient Sites: Ohio River Tributaries

The composite low-gradient sample of GRBOO-035 (Deer Creek) was dominated by four taxa (Chironomidae, Oligochaeta, *Trepobates* sp., and *Caenis* sp.), comprising 81% of the total sample (Appendix LXX). Individual metric scores and the MBI values are indicative of a stream of fair water quality (Tables XVI-XVII), yet designated as fully-supportive according to the macroinvertebrate assemblage (Appendix LXXI). This site was characterized by slightly-alkaline pH (7.17; Table VII), moderately-low conductivity (178; Table VII), and a stream reach with a mediocre total habitat score (135; Table XI).

The composite low-gradient sample of GRBOO-069 (Highland Creek) was moderately dominated by two taxa (Chironomidae and Corixidae), comprising 76% of the total sample (Appendix LXXVI). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XVI-XVII), and designated as non-supportive according to the macroinvertebrate assemblage (Appendix LXXVII). This site was characterized by moderately-alkaline pH (7.40; Table VII), moderately-low conductivity (216; Table VII), and a stream reach with a moderately-high total habitat score (136; Table XI).

The composite low-gradient sample of the both individual- and taxa-poor GRBOO-112 (Goose Pond Ditch) was dominated by two taxa (Chironomidae and *Corbicula fluminea*), comprising 86% of the total sample (Appendix XC). Individual metric scores and the MBI values are indicative of a stream of poor water quality (Tables XVI-XVII), and designated as non-supportive according to the macroinvertebrate assemblage (Appendix XCI). This site was characterized by moderately-acidic pH (6.48; Table VII), moderately-low conductivity (181; Table VII), and a stream reach with a very poor total habitat score (59; Table XI).

Ordinations

Examination of the environmental DCA ordination plots revealed that there was reasonable separation of low-gradient and high-gradient sites (Fig. IA), but not a considerable distinction

between sites according to ecoregions (Fig. IB). Similarly, macroinvertebrate assemblages were separated more effectively according to gradient (Fig. IIA) than ecoregion (Fig. IIB).

Examination of the physical and water chemistry variables indicated that no individual parameter strongly structured macroinvertebrate assemblages. The first three canonical axes accounted for only 17% of the variance for macroinvertebrate abundance data (Table XVIII). The CCA biplot Axis 1 revealed a gradient of geomorphology and habitat quality, while the second axis reflected a gradient only related to stream size (Fig. III). The distinctiveness of the high-gradient reaches was a function of coarser substrates and superior habitat quality, while the low-gradient reaches were defined according to the predominance of fine substrates (Fig. IIIA). Paralleling the distinctiveness of the low-gradient stream sites according to the macroinvertebrates and geomorphology was the somewhat weaker separation of Ecoregion 72 sites according to the same parameters (Fig. IIIB).

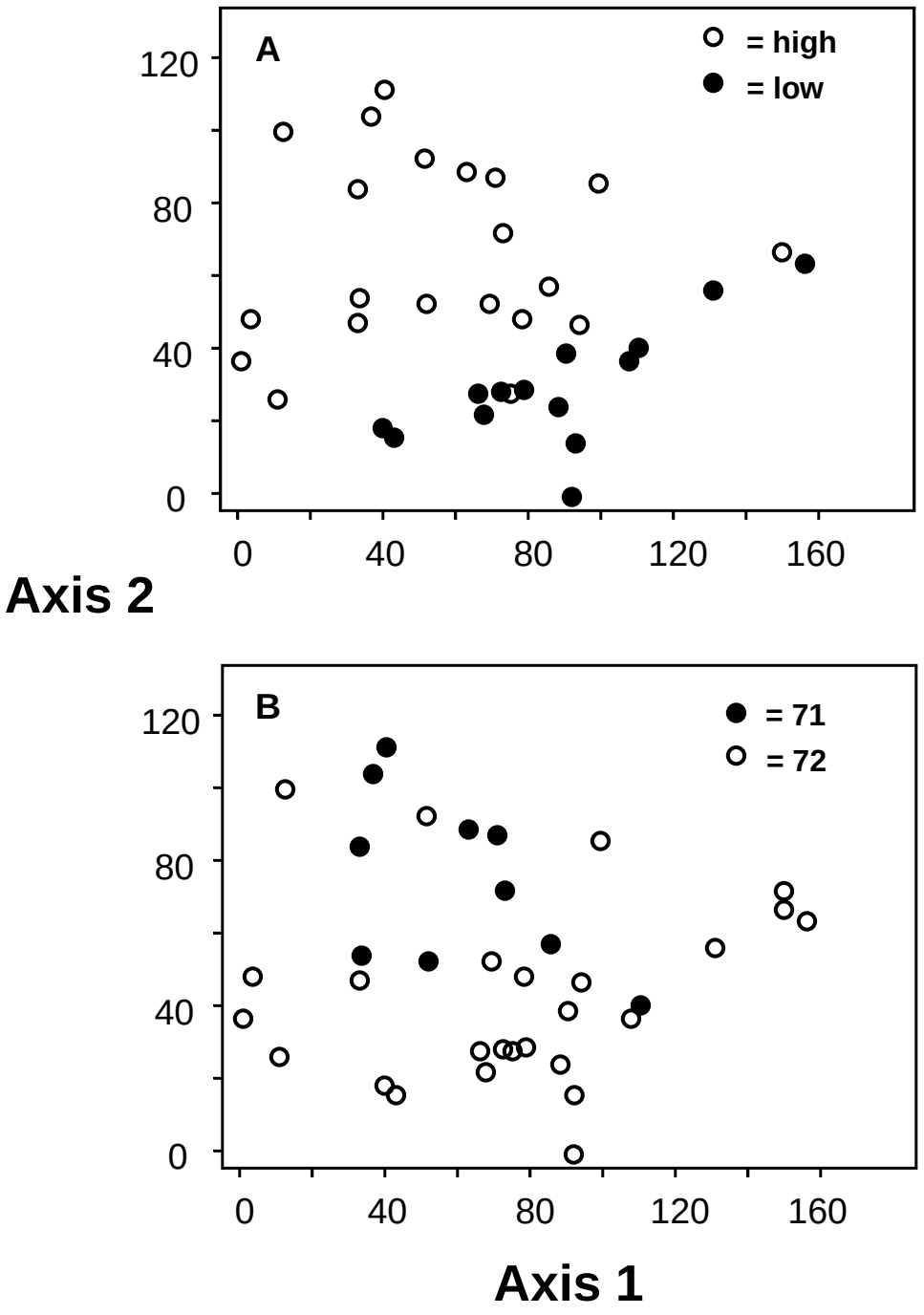

Figure I. Detrended correspondence analysis (DCA) ordination plot of sites according to environmental data. A = DCA plot with sites coded as either high-gradient or low gradient; B = DCA plot of sites coded as either located in Level III Ecoregion 71 (Interior Plateau) or Ecoregion 72 (Interior River Valley and Hills).

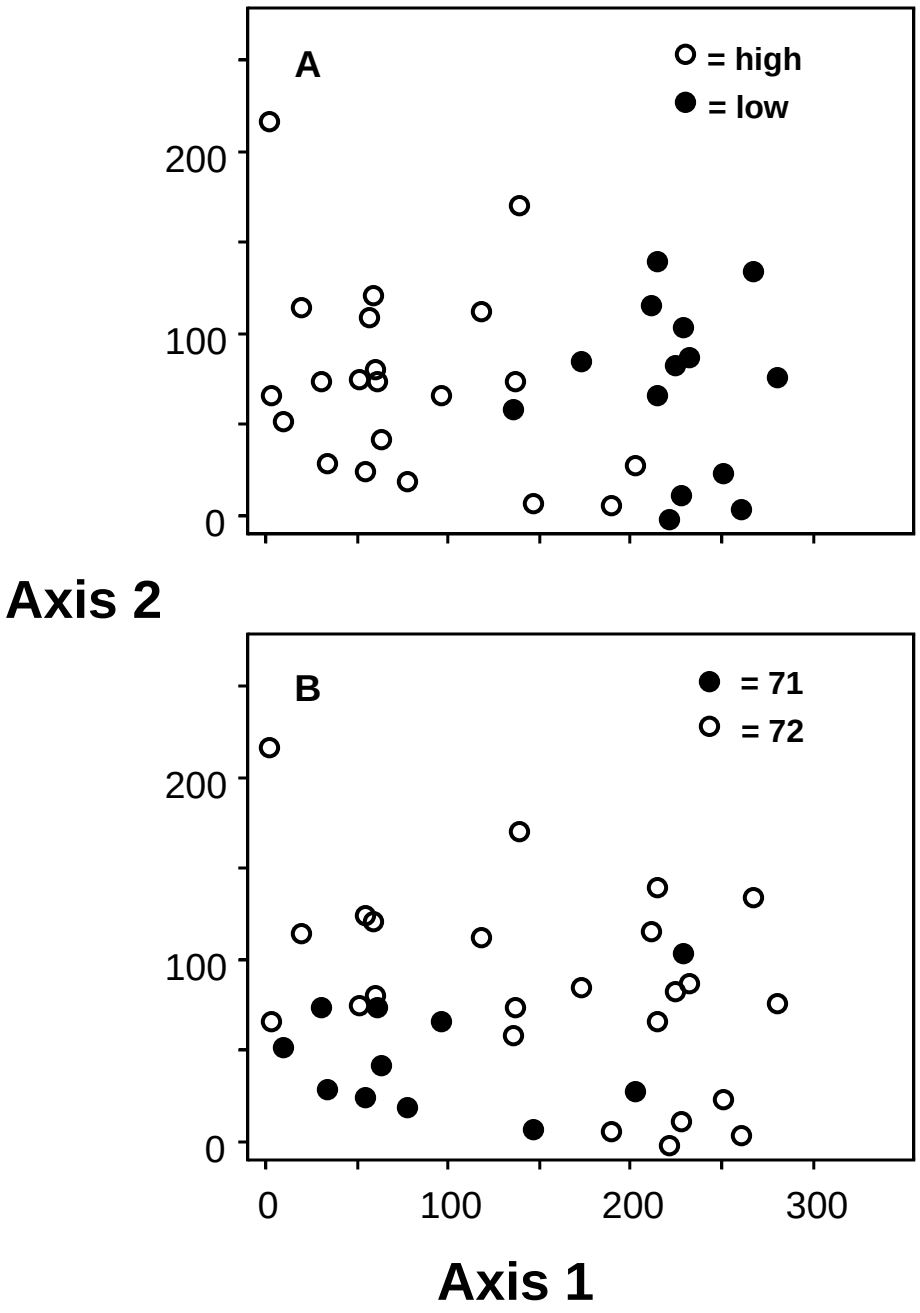

Figure II. Detrended correspondence analysis (DCA) ordination plot of sites according to macroinvertebrate data. A = DCA plot with sites coded as either high-gradient or low gradient; B = DCA plot of sites coded as either located in Level III Ecoregion 71 (Interior Plateau) or Ecoregion 72 (Interior River Valley and Hills).

Table XVIII. Summary of CCA eigenvalues and cumulative percentage of species data explained on the first three canonical axes.

	Axis 1	Axis 2	Axis 3
Eigenvalue	0.365	0.244	0.216
Cumulative % variance of species data explained	7.3	12.2	16.5

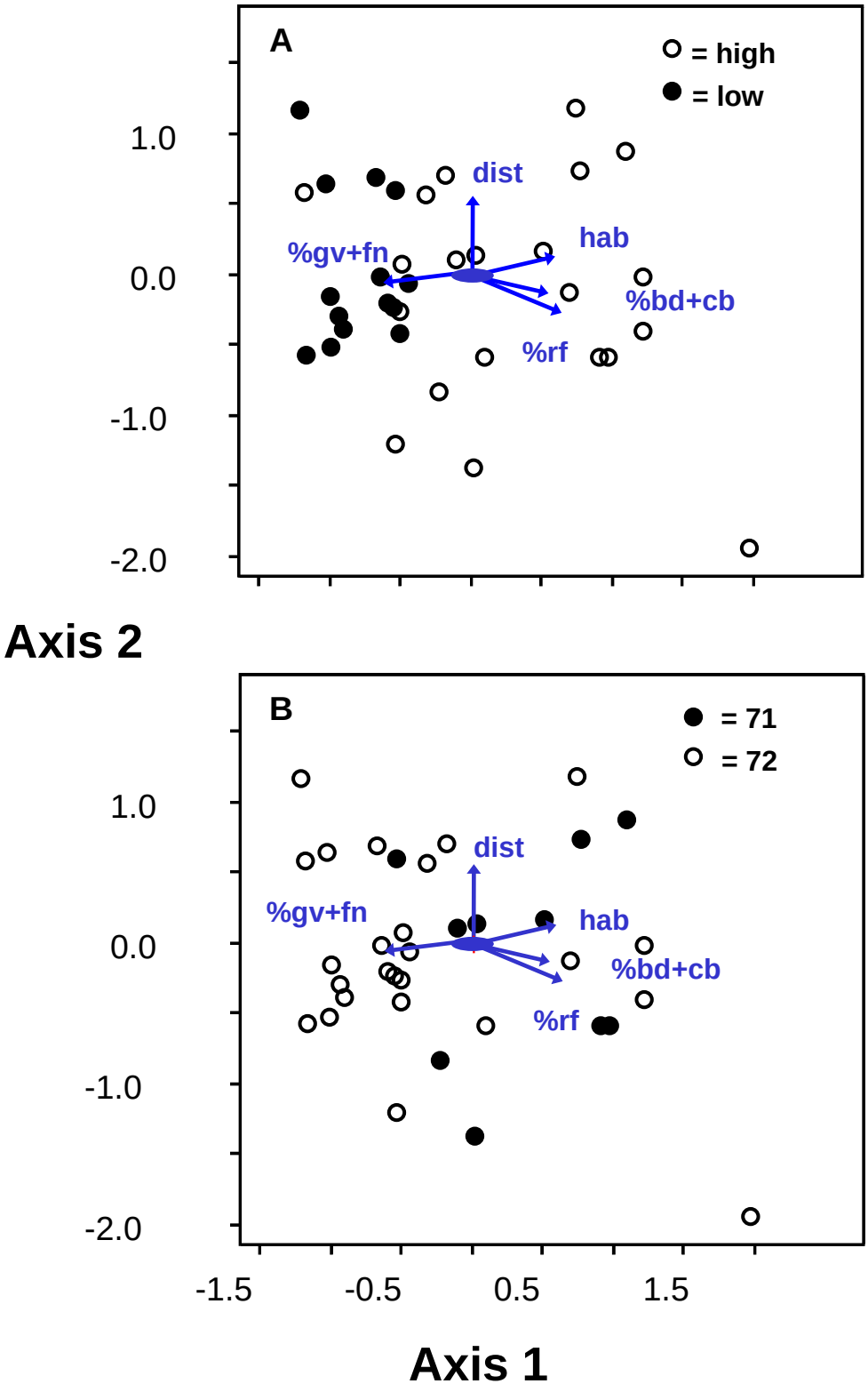

Figure III. Canonical correspondence analysis (CCA) biplots. A = CCA biplot with sites coded as either high-gradient or low gradient; B = CCA biplot of sites coded as either located in Level III Ecoregion 71 (Interior Plateau) or Ecoregion 72 (Interior River Valley and Hills).

Fecal Coliform Bacteria

Overall, 271 FC colony counts were obtained (Appendix LVII). Only one stream site (Plum Creek, FC-T25) was dry at the time of sampling (August). Three tiers of criteria, each defined according to number of FC colonies per 100 ml, exist regarding type of human use: (a) < 200 = direct human contact, (b) < 1000 = fishing and boating, (c) < 2000 = domestic use. The number of sites that exceeded all criteria varied by month: October (two), July and August (six each), June (eight), and September (15). The number of sites that met human contact criteria also varied by month but appeared to be inversely related to sites that exceeded 2000 colonies/100 ml: October (38 sites), July and August (32 and 24, respectively), June (20), and September (18).

Precipitation is suggested as a potential factor. Yet the lack of precipitation data across both spatial (e.g., sampling site, stream reach, entire drainage area) and temporal (i.e., accumulation of time prior to sampling event) scales impedes the ability to succinctly explain the variable monthly FC data. A cursory view of the number of sites either meeting (< 200 FC colonies per 100 ml) or exceeding (> 2000 FC colonies per 100 ml) all criteria, plotted on a monthly basis, versus mean accumulated precipitation at 2 days and 4 days prior to the first sampling event in a given month reveals that only the 4-d lag appears informative (Figure IV).

No stream site exceeded all criteria during all sampled months, and only one stream (Glens Fork - Russell Creek, GRBEX-01) exceeded all criteria in four separate months. This sampling site was immediately adjacent to a small farm that on five occasions (out of seven total site visits that also include separate macroinvertebrate and fish sampling events) had numerous

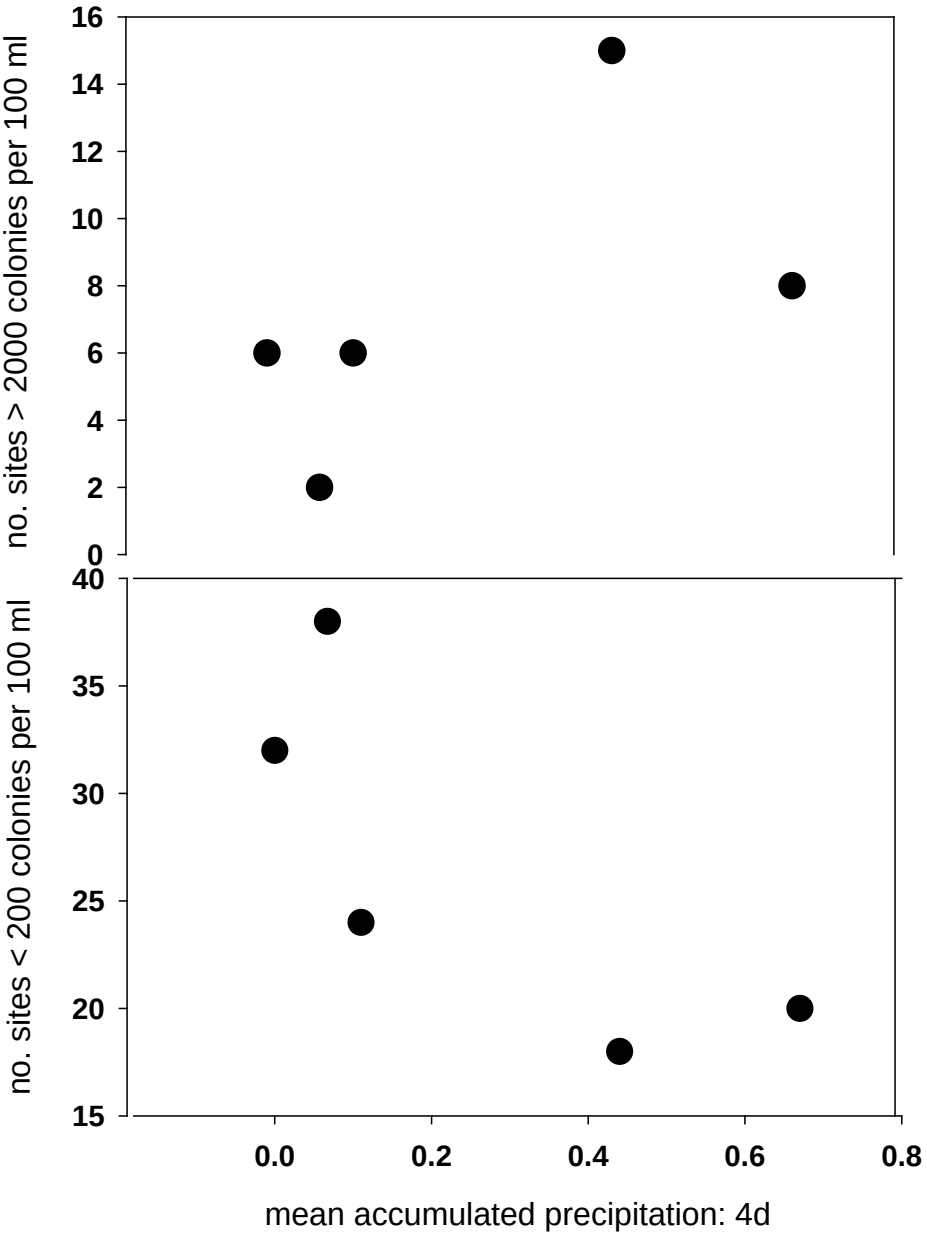

Figure IV. Scatterplot of monthly fecal coliform data as number of sites that exceed all (> 2000 colonies per 100 ml) or meet human contact (< 200 colonies per 100 ml) criteria vs. mean accumulated precipitation 4 days prior to first sampling date.

cattle in-stream within 50 meters of WKU personnel. In addition, no stream sites (except Glens Fork) exceeded all criteria in three of five months. In contrast, six stream sites (Plum Creek, GRBEX-14; Lewis Creek, GRBEX-15; Craborchard Creek, GRBEX-28; Pleasant Run, GRBEX-29; Flat Creek, GRBEX-30; Pond River, FC-sta.no.44) met human contact criteria during all five months. Fecal coliform bacteria counts for Pleasant Run and Flat Creek need to viewed as indicative of Western Kentucky Coalfields acid mine drainage. We have recorded pH values as low as 3.15 and 4.66 for Pleasant Run and Flat Creek, respectively. Eight streams (Wolf Lick Creek, GRBEX-11; McGrady Creek, GRBEX-18; East Fork Pond River, GRBEX-22; Buck Creek, GRBEX-24; East Branch West Fork Pond River, GRBEX-26; Wolf Lick Creek, FC-sta.no.46; Russell Creek, FC-sta.no.49; Tradewater River, FC-sta.no.50) met all criteria during four of five months, and nine streams (Russell Creek, GRBEX-02; Upper Brush Creek, GRBEX-08; Claylick Creek, GRBEX-10; Caney Creek, GRBEX-17; Greasy Creek, FC-T12; Rough River, FC-T34; Mill Creek, FC-T35; Mud River, FC-sta.no.47; Gasper River, FC-sta.no.48) met all criteria during three of five months.

V. Summary and Conclusions

Regardless of whether sites were categorized according to geomorphic characteristics or landscape-level location within the Commonwealth (i.e., ecoregions), this project did not reveal a single site of exceptional water quality as defined by biological attributes. Similarly, only 6 of 35 sites (5 high-gradient, 1 low gradient) were designated as providing full biological support according to the macroinvertebrate assemblage. Ordination analysis by detrended correspondence analysis (DCA) revealed a relatively clear separation of sites categorized as either high- or low-gradient according to both environmental parameters (e.g., pH, % riffle) and macroinvertebrate assemblages. In contrast, DCA showed a much less evident separation of sites as defined by Level III Ecoregion 71 (Interior Plateau) and Ecoregion 72 (Interior River Valley and Hills). The latter ordination demonstrated a similar pattern with environmental and biological parameters. The relative unimportance of geography, coupled with the apparent importance of substrate composition, suggest that local scale habitat features at least partially regulate macroinvertebrate assemblage composition across the 30 sampling sites.

The number of fecal coliform colonies varied widely during the sampling period, ranging from < 8 in acid mine-drainage impacted streams in the Western Kentucky Coalfields to > 12,000 in numerous streams in agriculture watersheds. Site-specific bacteriological data was also highly variable across months, and appeared to be related to climatological conditions. Colony counts were relatively high during May due to repeated rainfall events prior to, and during, sampling while counts were considerably lower during late summer when drought-like conditions prevail.

Literature Cited

American Public Health Association (APHA) (1998) *Standard Methods for the Examination of Water and Wastewater*. APHA, American Water Works Association and Water Environment Federation. 20th edition. Washington, D.C.

Barbour M.T., Plafkin J.L., Bradley B.P., Graves C.G. & Wisseman R.W. (1992) Evaluation of EPA's rapid bioassessment benthic metrics: metric redundancy and variability among reference stream sites. *Environmental Toxicology and Chemistry*, **11**, 437-449.

Barbour M.T., Gerritsen J., Snyder B.D. & Stribling J.B. (1999) *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition.* EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.

Burr B.M. & Warren M.L. Jr. (1986) *A Distributional Atlas of Kentucky Fishes*. Kentucky Nature Preserves Commission, Scientific and Technical Series Number 4.

Carter J.L. & Resh V.H. (2001) After site selection and before data analysis: sampling , sorting, and laboratory procedures used in stream benthic macroinvertebrate monitoring programs by USA state agencies. *Journal of the North American Benthological Society,* **20**, 658-682.

Kentucky Department of Environmental Protection (KDEP) (1993) *Methods for Assessing Biological Integrity of Surface Waters.* Kentucky Department of Environmental Protection, Division of Water, Frankfort, Kentucky.

Kentucky Division of Water (KDOW) (1986) *Quality Assurance Quidelines*. Kentucky Natural Resources and Environmental Protection Cabinet, Frankfort, KY.

Lenat D. (1993) A biotic index for the southeastern United States: derivation and list of tolerance values, with criteria for assigning water-quality ratings. *Journal of the North American Benthological Society,* **12**, 279-290.

McGarigal K., Cushman S. & Stafford S. (2000) *Multivariate Statistics for Wildlife and Ecology Research*. Springer-Verlag, New York, New York, U.S.A.

Ohio Environmental Protection Agency (Ohio EPA). (1999) Association between nutrients, habitat, and the aquatic biota in Ohio rivers and streams. Ohio EPA Technical Bulletin MAS/1999-1-1. Division of Surface Water, Monitoring and Assessment Section, Columbus, OH. 64 pp.

Plafkin J.L., Barbour M.T., Porter K.D., Gross S.K & Hughes R.M. (1989) *Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish.* United States Environmental Protection Agency, Washington. EPA/444/4-89-001.

Resh V.H. & Unzicker J.D. (1975) Water quality monitoring and aquatic organisms: the importance of species identification. *Journal of the Water Pollution Control Federation*, **47**, 9-19.

Resh V.H. & Jackson J.K. (1993) Rapid Assessment approaches to biomonitoring using benthic macroinvertebrates. In: *Freshwater Biomonitoring and Benthic Macroinvertebrate* (Eds D.M. Rosenberg & V.H. Resh), pp. 195-233. Routledge, Chapman & Hall, Inc., U.S.A.

Resh V.H. & McElravy E.P. (1993) Contemporary quantitative approaches to biomonitoring using benthic macroinvertebrates. In: *Freshwater Biomonitoring and Benthic Macroinvertebrate* (Eds D.M. Rosenberg & V.H. Resh), pp. 159-194. Routledge, Chapman & Hall, Inc., U.S.A.

Rosenberg D.M. & Resh V.H. (1993) Introduction to freshwater biomonitoring and benthic macroinvertebrates. In: *Freshwater Biomonitoring and Benthic Macroinvertebrate* (Eds D.M. Rosenberg & V.H. Resh), pp. 1-9. Routledge, Chapman & Hall, Inc., U.S.A.

ter Braak, C. J. F. (1986) Canonical correspondence analysis: a new eigenvector technique for multivariate direct gradient analysis. *Ecology* 67: 1167-1179.

U.S.G.S. (2002) Real-Time Data for Kentucky. URL address http://water.usgs.gov/ky/nwis/current?

Appendix A. Financial and administrative closeout

Bacteriological assessment

Milestone	Expected Begin Date	Expected End Date	Actual Begin Date	Actual End Date
1. Submit all draft materials to the Division of Water, Nonpoint Source Section for review and approval	Duration			
2. Submit Annual Reports and/or participate in Division of Water sponsored NPS Conference(s)	Duration			
3. Request most current Final and Close Out Report Guidelines	Jun.02	Oct.02	Oct.02	Oct.02
4. Submit three copies of Final and Close Out Reports and submit three copies of all products produced by this project	Oct.02	Oct.02	Oct.02	Aug.03
5. Select 50 sites in Green and Tradewater watersheds	Apr.01	Jun.01	May.01	Jun.01
6. Collect and analyze FC samples from all sites	May.01	Oct.01	Jun.01	Oct.01
7. Submit monthly reports	Jun.01	Nov.01	Jun.01	Nov.01
8. Present preliminary findings at Nonpoint Source Conference in lieu of annual report	Sep.01	Dec.01		
9. Written report with assessments of data	Feb.02	Jun.02	Oct.02	Aug.03

Appendix A. Cont.

Bacteriological assessment - Workplan Outputs

1.) The only drafted materials that were submitted were (a) sampling protocols for fecal coliform bacteria, and (b) QA/QG guidelines. Both were approved prior to funding.

2.) A fully executed Memorandum of Agreement (= Master Agreement) was in place only on June 1, 2001. The 2001 NPS Conference was not held.

3.) The Final and Closeout Reports were initiated October 2002. Guidelines were requested.

4.) The Final and Closeout Reports were submitted within this final report.

5.) The locations of all 50 sampling sites were chosen and submitted to WKU by Kentucky Division of Water Personnel by June 2001.

6.) Monthly sampling periods have been completed for June – October, 2001. Data for plate counts of fecal coliform bacteria for all 50 sites (plus 50 duplicates) for the June – October, 2001 have been completed.

7.) All data was submitted to Kentucky Division of Water Personnel by November 2001.

8.) The 2001 NPS Conference was not held.

9.) Analysis for fecal coliform bacteria has been completed, and all data has been submitted to Kentucky Division of Water Personnel. The final report is submitted here..

Appendix A. Cont.

Biological assessment

Milestone	Expected Begin Date	Expected End Date	Actual Begin Date	Actual End Date
10. Submit all draft materials to the Division of Water, Nonpoint Source Section for review and approval	Duration			
11. Submit Annual Reports and/or participate in Division of Water sponsored NPS Conference(s)	Duration			
12. Request most current Final and Close Out Report Guidelines	Oct.02	Oct.02	Oct.02	Oct.02
13. Submit three copies Final and Close Out Reports and submit three copies of all products produced by this project	Oct.02	Oct.02	Oct.02	Aug.03
14. Select 75 sites in Green and Tradewater watersheds	Apr.01	Jun.01	Apr.01	May.01
15. Collect biological samples from 35 sites	May.01	Sep.01	Jul.01	Aug.01
16. Taxonomic identification of biological samples	Jun.01	Dec.01	Sep.01	Aug.02
17. Stream usage assessments presented to DOW for inclusion in watershed monitoring report	Oct.02	Nov.02	Oct.02	Aug.03
18. Written report with assessments of biological data	Oct.02	Nov.02	Oct.02	Aug.03

Appendix A. Cont.

Biological assessment - Workplan Outputs

10.) The only drafted materials that have been submitted to date are (a) sampling protocols for aquatic macroinvertebrates, and (b) QA/QG guidelines. Both were approved prior to funding.

11.) A fully executed Memorandum of Agreement (= Master Agreement) was in place only on June 1, 2001, so an Annual Report is not applicable at this time. The 2001 NPS Conference was not held.

12.) The Final and Closeout Reports were initiated October 2002. Guidelines were requested.

13) The Final and Closeout Reports were submitted within this final report.

14.) Selection of 75 sites was completed by May 2001.

15.) Biological sampling for aquatic macroinvertebrates for all 35 sites transpired between July 5 and August 30, 2001.

16.) Identification of macroinvertebrates was completed for riffle habitats from 21 sites treated as high-gradient. Identification of macroinvertebrates from other habitats (i.e., non-riffle or “multihabitat”) in high-gradients was completed. Identification of macroinvertebrates from 14 stream sites treated as low-gradient was\ completed.

17.) Finalized and included within the body of this report.

18.) Finalized and included within the body of this report.

Appendix A.
Cont.

Detailed Budget

Budget Categories	Section 319 (h)	Non-Federal Match	Total
Personnel	$ 41,902	$ 16,000	$ 57,902
Supplies	$ 78	$ 703	$ 781
Equipment	$ -	$ 4,000	$ 4,000
Travel	$ -	$ 5,060	$ 5,060
Contractual	$ -	$ 4,050	$ 4,050
Operating Costs	$ 8,020	$ 3,520	$ 11,540
Other	$ -	$ -	$ -
Total	$ 50,000	$ 33,333	$ 83,333

All federal dollars budgeted originally ($50,000) were expended

Appendix B. DOW-approved Quality Assurance / Quality-Control Plan (QA/QC)

Quality Assurance / Quality Control

Biological Assessment

All standard quality assurance/quality control (QA/QC) procedures, as outlined in APHA (1998) and KDOW Quality Assurance Guideline (1986), were followed. Selected and random WKU macroinvertebrate collections were examined by SSS personnel to ensure consistency with taxonomic identifications. The internal KDOW protocols and QA guidelines mentioned above are part of the then-approved EPA-approved Kentucky Department of Environmental Protection (DEP) QA/QC plan. A QA/QC plan had been submitted to the KDOW for approval. All monitoring activities that were conducted as part of this project were consistent with the approved QA/QC plan.

Bacteriological Assessment

All standard QA/QC procedures, as outlined in APHA (1998) and KDOW Quality Assurance Guidelines (1986), were followed. A duplicate number of samples (5, or 10%) were analyzed monthly. All data was submitted on a monthly basis. The internal KDOW protocols and QA guidelines mentioned above are part of the then-approved EPA-approved Kentucky Department of Environmental Protection (DEP) QA/QC plan. A QA/QC plan had been submitted to the KDOW for approval. All monitoring activities that were conducted as part of this project were consistent with the approved QA/QC plan.

Appendix I. Taxa list for GRBOO-004 (West Fork Pond River) based on high-gradient, kicknet sampling.

Taxon		
OLIGOCHAETA		11
CRUSTACEA		
	Asellidae	
		Caecidotea sp. 120
		immature asellid 2
	Cambaridae	
		Orconectes sp. 4
MOLLUSCA		
	Corbiculiidae	
		Corbicula fluminea 27
	Sphaeriidae	
		Sphaerium sp. 55
EPHEMEROPTERA		
	Baetidae	
		Acerpenna sp. 3
	Caenidae	
		Caenis sp. 13
	Heptageniidae	
		Stenacron sp. 11
ODONATA		
	Aeshnidae	
		Aeshna sp. 2
		Nasiaeschna sp. 1
		immature aeshnid 1
	Coenagrionidae	
		Argia sp. 1
		immature coenagrionid 1
PLECOPTERA		
	Perlidae	
		Acroneuria sp. 4
HEMIPTERA		
	Gerridae	
		Trepobates sp. 1
NEUROPTERA		
	Sialidae	
		Sialis sp. 1
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 1038
		Hydropsyche sp. 1

Appendix I. Cont.

Taxon			
	Philopotamidae		
		Chimarra sp.	14
COLEOPTERA			
	Dryopidae		
		Helichus sp.	2
	Elmidae		
		Ancyronyx variegatus	2
		Dubiraphia sp.	19
		Macronychus glabratus	3
		Stenelmis sp.	2664
	Gyrinidae		
		Dineutus sp.	1
DIPTERA			
	Chironomidae		65
	Tabanidae		
		Chrysops sp.	2
		SUM	**4069**

Appendix II. Taxa list for GRBOO-004 (West Fork Pond River) based on high-gradient, multihabitat sampling.

Taxon		
CRUSTACEA		
Atyidae		
	Palaemonetes sp.	3
Talitridae		
	Hyalella azteca	2
MOLLUSCA		
Corbiculiidae		
	Corbicula fluminea	2
EPHEMEROPTERA		
Baetidae		
	Callibaetis sp.	1
Caenidae		
	Caenis sp.	6
Heptageniidae		
	Stenacron sp.	14
	immature heptageniid	1
Leptophlebiidae		
	Choroterpes sp.	1
ODONATA		
Coenagrionidae		
	Enallagma sp.	3
HEMIPTERA		
Corixidae		
	immature corixid	2
NEUROPTERA		
Sialidae		
	Sialis sp.	2
TRICHOPTERA		
Hydropsychidae		
	Cheumatopsyche sp.	110
COLEOPTERA		
Elmidae		
	Ancyronyx variegatus	1
	Macronychus glabratus	8
	Stenelmis sp.	85
Haliplidae		
	Peltodytes sp.	2

Appendix II. Cont.

Taxon		
DIPTERA		
	Chironomidae	39
	Stratiomyiidae	
	Stratiomys sp.	1
	SUM	**283**

Appendix III. Stream usage assessment for GRBOO-004.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: WEST FORK POND RIVER (Stream must be on 1:100k map)

GNIS Feature ID: 506444 Segment No.: __ __Station ID: WKU0332 (GRBOO-004)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: POND RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110006

County 1: CHRISTIAN County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: GRAHAM

Latitude: 37.1361 Longitude: -87.3654_ (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-25-01 (mm-dd-yy) End: 07-25-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 7550_____
Cause Code: 1600__ Source Code(s): 7550_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix IV. Taxa list for GRBOO-008 (Indian Camp Creek) based on high-gradient, kicknet sampling.

Taxon		
CRUSTACEA		
	Asellidae	
		Caecidotea sp. 820
	Cambaridae	
		Orconectes sp. 8
MOLLUSCA		
	Corbiculiidae	
		Corbicula fluminea 13
	Physidae	
		Physella sp. 2
	Planorbidae	
		Helisoma sp. 1
	Sphaeriidae	
		Sphaerium sp. 92
EPHEMEROPTERA		
	Heptageniidae	
		Stenacron sp. 2
		Stenonema sp. 1
PLECOPTERA		
	Perlidae	
		Neoperla sp. 66
NEUROPTERA		
	Sialidae	
		Sialis sp. 2
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 1438
	Philopotamidae	
		Chimarra sp. 2
COLEOPTERA		
	Dryopidae	
		Helichus sp. 2
	Elmidae	
		Dubiraphia sp. 3
		Stenelmis sp. 204
	Gyrinidae	
		Dineutus sp. 2

Appendix IV. Cont.

Taxon			
DIPTERA			
	Chironomidae		460
	Tipulidae		
		Hexatoma sp.	6
		Ormosia sp.	1
		SUM	**3125**

Appendix V. Taxa list for GRBOO-008 (Indian Camp Creek) based on high-gradient, multihabitat sampling.

Taxon		
OLIGOCHAETA		4
CRUSTACEA		
	Asellidae	
		Caecidotea sp. 49
	Talitridae	
		Hyalella azteca 91
MOLLUSCA		
	Corbiculiidae	
		Corbicula fluminea 8
	Physidae	
		Physella sp. 19
	Planorbidae	
		Helisoma sp. 14
	Sphaeriidae	
		Pisidium sp. 2
		Sphaerium sp. 6
EPHEMEROPTERA		
	Baetidae	
		Centroptilum sp. 1
	Caenidae	
		Caenis sp. 11
	Heptageniidae	
		Stenacron sp. 5
		Stenonema sp. 5
ODONATA		
	Aeshnidae	
		Basiaeschna sp. 1
	Coenagrionidae	
		Enallagma sp. 2
	Libellulidae	
		Neurocordulia sp. 1
NEUROPTERA		
	Sialidae	
		Sialis sp. 6
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 5
		Hydropsyche sp. 2

Appendix V. Cont.

Taxon			
COLEOPTERA			
	Elmidae		
		Dubiraphia sp.	7
		Stenelmis sp.	1
	Gyrinidae		
		Dineutus sp.	1
DIPTERA			
	Ceratopogonidae		
		Bezzia/Palpomyia sp.	1
	Chironomidae		74
		SUM	**316**

Appendix VI. Stream usage assessment for GRBOO-008.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: INDIAN CAMP CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 494914 Segment No.: __ __Station ID: WKU0333 (GRBOO-008)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: GREEN RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110003

County 1: BUTLER County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: FLENER

Latitude: 37.3065 Longitude: -86-6902 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-26-01 (mm-dd-yy) End: 07-26-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 1050_____
Cause Code: 1600__ Source Code(s): 7550_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix VII. Taxa list for GRBOO-022 (unnamed tributary to Wiggington Creek) based on high-gradient, kicknet sampling.

Taxon		
OLIGOCHAETA		15
CRUSTACEA		
	Asellidae	
		Lirceus sp. 21
		immature asellid 5
	Crangonyctidae	
		immature crangonyctid 3
MOLLUSCA		
	Lymnaeidae	
		Pseudosuccinea columella 1
	Physidae	
		Physella sp. 1
	Planorbidae	
		Helisoma sp. 1
	Pleuroceridae	
		Elimia sp. 152
		Pleurocera sp. 51
	Sphaeriidae	
		Pisidium sp. 10
		Sphaerium sp. 7
EPHEMEROPTERA		
	Baetidae	
		Fallceon sp. 24
HEMIPTERA		
	Veliidae	
		Mesovelia sp. 7
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 40
		Hydropsyche sp. 4
	Polycentropodidae	
		Cyrnellus fraternus 2
COLEOPTERA		
	Dryopidae	
		Helichus sp. 3
	Dytiscidae	
		Hydroporus sp. 1
		unidentified dytiscid adult 1
	Elmidae	
		Optioservus sp. 38
		Stenelmis sp. 1

Appendix VII. Cont.

Taxon			
	Hydrophilidae		
		Hydrobius sp.	1
DIPTERA			
	Ceratopogonidae		
		Probezzia sp.	4
	Chironomidae		250
	Empididae		
		Hemerodromia sp.	8
	Psychodidae		
		Pericoma sp.	1
	Simuliidae		
		Simulium sp.	1
	Tabanidae		
		Chrysops sp.	3
	Tipulidae		
		Pedicia sp.	1
		Pseudolimnophila sp.	2
		Tipula sp.	2
		SUM	**661**

Appendix VIII. Taxa list for GRBOO-022 (unnamed tributary to Wiggington Creek) based on high-gradient, multihabitat sampling.

Taxon		
OLIGOCHAETA		12
CRUSTACEA		
	Asellidae	
		Lirceus sp. 26
	Cambaridae	
		immature cambarid 1
MOLLUSCA		
	Physidae	
		Physella sp. 2
	Pleuroceridae	
		Elimia sp. 33
		Pleurocera sp. 40
	Sphaeriidae	
		Pisidium sp. 3
EPHEMEROPTERA		
	Baetidae	
		Baetis sp. 1
ODONATA		
	Aeshnidae	
		Boyeria sp. 1
HEMIPTERA		
	Gerridae	
		immature gerrid 1
NEUROPTERA		
	Sialidae	
		Sialis sp. 1
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 2
		Hydropsyche sp. 2
	Leptoceridae	
		immature leptocerid 1
	Psychomyiidae	
		Lype diversa 14

Appendix VIII. Cont.

Taxon			
COLEOPTERA			
	Dryopidae		
		Helichus sp.	15
	Dytiscidae		
		Hydroporus sp.	1
		Hygrotus sp.	1
	Elmidae		
		Dubiraphia sp.	1
DIPTERA			
	Ceratopogonidae		
		Atrichopogon sp.	1
	Chironomidae		100
	Empididae		
		Chelifera sp.	5
	Tabanidae		
		Chrysops sp.	5
		SUM	**269**

Appendix IX. Stream usage assessment for GRBOO-022.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: UNNAMED TRIBUTARY TO WIGGINGTON CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 506716 Segment No.: __ __Station ID: WKU0336 (GRBOO-022)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: WIGGINGTON CREEK

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110002

County 1: LOGAN County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: DENNIS

Latitude: 36.8733 Longitude: -86.7717 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-20-01 (mm-dd-yy) End: 07-20-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 1050, 7600, 7700_____
Cause Code: 1600__ Source Code(s): 1050, 7600, 7700_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix X. Taxa list for GRBOO-024 (Bull Run) based on high-gradient kicknet sampling.

Taxon		
OLIGOCHAETA		1
CRUSTACEA		
	Asellidae	
		Caecidotea sp. 2
MOLLUSCA		
	Corbiculiidae	
		Corbicula fluminea 106
	Lymnaeidae	
		Pseudosuccinea columella 29
	Physidae	
		Physella sp. 9
EPHEMEROPTERA		
	Caenidae	
		Caenis sp. 1
ODONATA		
	Aeshnidae	
		Boyeria sp. 1
	Calopterygidae	
		Calopteryx sp. 2
HEMIPTERA		
	Veliidae	
		Rhagovelia sp. 5
MEGALOPTERA		
	Corydalidae	
		Corydalus cornutus 23
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 464
		Hydropsyche sp. 115
	Hydroptilidae	
		Hydroptila sp. 7
	Philopotamidae	
		Chimarra sp. 7
COLEOPTERA		
	Elmidae	
		Stenelmis sp. 66
	Hydrophilidae	
		Berosus sp. 4

Appendix X. Cont.

Taxon		
DIPTERA		
	Ceratopogonidae	
		Probezzia sp. 2
	Chironomidae	120
	Empididae	
		Hemerodromia sp. 70
	Tipulidae	
		Ormosia sp. 1
		Pseudolimnophila sp. 3
		Tipula sp. 47
		SUM 1085

Appendix XI. Taxa list for GRBOO-024 (Bull Run) based on high-gradient multihabitat sampling.

Taxon		
CRUSTACEA		
	Asellidae	
		Lirceus sp. 10
MOLLUSCA		
	Corbiculiidae	
		Corbicula fluminea 5
	Physidae	
		Physella sp. 46
EPHEMEROPTERA		
	Tricorythidae	
		Tricorythodes sp. 1
ODONATA		
	Aeshnidae	
		Boyeria sp. 1
	Calopterygidae	
		Calopteryx sp. 3
	Coenagrionidae	
		Argia sp. 2
MEGALOPTERA		
	Corydalidae	
		Corydalus cornutus 3
NEUROPTERA		
	Sialidae	
		Sialis sp. 1
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 53
		Hydropsyche sp. 33
		immature hydropsychid 2
	Hydroptilidae	
		Hydroptila sp. 2
	Leptoceridae	
		Oecetis sp. 1
COLEOPTERA		
	Elmidae	
		Dubiraphia sp. 1
		Macronychus glabratus 1

Appendix XI. Cont.

Taxon		
DIPTERA		
Ceratopogonidae		
	Dasyhelea sp.	4
Chironomidae		82
Empididae		
	Hemerodromia sp.	16
Tabanidae		
	Chrysops sp.	1
	SUM	**268**

Appendix XII. Stream usage assessment for GRBOO-024.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: BULL RUN (Stream must be on 1:100k map)

GNIS Feature ID: 488363 Segment No.: __ __Station ID: WKU0337 (GRBOO-024)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: THOROUGHFARE CREEK

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110003

County 1: OHIO County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: CROMWELL

Latitude: 37.2671 Longitude: -86.8597 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-19-01 (mm-dd-yy) End: 07-19-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM				X	

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 5100_____
Cause Code: 1300__ Source Code(s): 5100_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix XIII. Taxa list for GRBOO-025 (Deer Creek) based on high-gradient kicknet sampling.

Taxon		
OLIGOCHAETA		32
CRUSTACEA		
	Asellidae	
		Caecidotea sp. 3
MOLLUSCA		
	Physidae	
		Physella sp. 6
	Planorbidae	
		Helisoma sp. 11
EPHEMEROPTERA		
	Caenidae	
		Caenis sp. 146
	Heptageniidae	
		Stenonema sp. 6
	Tricorythidae	
		Tricorythodes sp. 3
ODONATA		
	Aeshnidae	
		Boyeria sp. 1
HEMIPTERA		
	Belostomatidae	
		Belostoma sp. 1
	Veliidae	
		Mesovelia sp. 1
		Steinovelia sp. 1
NEUROPTERA		
	Sialidae	
		Sialis sp. 2
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 431
	Leptoceridae	
		Oecetis sp. 1
COLEOPTERA		
	Dryopidae	
		Helichus sp. 10
	Elmidae	
		Dubiraphia sp. 6
		Stenelmis sp. 605

Appendix XIII. Cont.

Taxon			
	Haliplidae		
		Peltodytes sp.	2
	Hydrophilidae		
		Anacaena sp.	5
		Berosus sp.	43
		Enochrus sp.	25
		Laccophilus sp.	1
		Tropisternus sp.	14
DIPTERA			
	Ceratopogonidae		
		Atrichopogon sp.	3
	Chironomidae		173
	Tabanidae		
		Chrysops sp.	28
	Tipulidae		
		Pseudolimnophila sp.	2
		SUM	**1562**

Appendix XIV. Taxa list for GRBOO-025 (Deer Creek) based on high-gradient multihabitat sampling.

Taxon		
PLATYHELMINTHES		
	Planariidae	
		Dugesia sp. 1
OLIGOCHAETA		6
CRUSTACEA		
	Asellidae	
		Caecidotea sp. 5
MOLLUSCA		
	Physidae	
		Physella sp. 11
	Planorbidae	
		Helisoma sp. 49
	Sphaeriidae	
		Pisidium sp. 1
EPHEMEROPTERA		
	Baetidae	
		Callibaetis sp. 1
	Caenidae	
		Caenis sp. 12
	Heptageniidae	
		Stenacron sp. 24
		Stenonema sp. 124
ODONATA		
	Coenagrionidae	
		Argia sp. 11
		Enallagma sp. 60
	Libellulidae	
		immature libellulid 4
HEMIPTERA		
	Gerridae	
		immature gerrid 1
	Veliidae	
		Mesovelia sp. 3
COLEOPTERA		
	Dytiscidae	
		Gyrinus sp. 1
	Elmidae	
		Stenelmis sp. 7

Appendix XIV. Cont.

Taxon			
	Haliplidae		
		Peltodytes sp.	6
	Hydrophilidae		
		Berosus sp.	1
DIPTERA			
	Ceratopogonidae		
		immature ceratopogonid	1
	Chironomidae		35
		SUM	**364**

Appendix XV. Stream usage assessment for GRBOO-025.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: DEER CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 490771 Segment No.: __ __Station ID: WKU0338 (GRBOO-025)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: GREEN RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110005

County 1: WEBSTER County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: SEBREE7

Latitude: 37.5065 Longitude: -87.6120 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-30-01 (mm-dd-yy) End: 07-30-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 1050, 7600, 7700_____
Cause Code: 1600__ Source Code(s): 1050, 7600, 7700_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix XVI. Taxa list for GRBOO-030 (Pond Creek) based on high-gradient kicknet sampling.

Taxon			
OLIGOCHAETA			2
CRUSTACEA			
	Asellidae		
		Caecidotea sp.	9
	Cambaridae		
		immature cambarid	2
	Gammaridae		
		Gammarus sp.	1
HEMIPTERA			
	Veliidae		
		Microvelia sp.	1
NEUROPTERA			
	Sialidae		
		Sialis sp.	1
TRICHOPTERA			
	Hydropsychidae		
		Cheumatopsyche sp.	24
COLEOPTERA			
	Dryopidae		
		Helichus sp.	1
	Dytiscidae		
		Hydroporus sp.	1
	Elmidae		
		Stenelmis sp.	43
DIPTERA			
	Ceratopogonidae		
		Probezzia sp.	4
	Chironomidae		47
	Empididae		
		Hemerodromia sp.	3
	Tabanidae		
		Chrysops sp.	4
	Tipulidae		
		Tipula sp.	1
		SUM	**144**

Appendix XVII. Taxa list for GRBOO-030 (Pond Creek) based on high-gradient multihabitat sampling.

Taxon			
OLIGOCHAETA			1
CRUSTACEA			
	Asellidae		
		Caecidotea sp.	29
EPHEMEROPTERA			
	Baetidae		
		Centroptilum sp.	1
	Heptageniidae		
		Stenonema sp.	13
ODONATA			
	Aeshnidae		
		Boyeria sp.	1
	Calopterygidae		
		Hetaerina sp.	1
	Coenagrionidae		
		Enallagma sp.	1
	Libellulidae		
		immature libellulid	7
NEUROPTERA			
	Sialidae		
		Sialis sp.	3
TRICHOPTERA			
	Hydropsychidae		
		Cheumatopsyche sp.	22
COLEOPTERA			
	Dytiscidae		
		Hydroporus sp.	1
	Elmidae		
		Dubiraphia sp.	8
		Stenelmis sp.	2
DIPTERA			
	Chironomidae		68
		SUM	**158**

Appendix XVIII. Stream usage assessment for GRBOO-030.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: POND CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 501042 Segment No.: __ __Station ID: WKU0339 (GRBOO-030)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: GREEN RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110003

County 1: MUHLENBERG County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: GREENVILLE

Latitude: 37.1462 Longitude: -87.1601 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-23-01 (mm-dd-yy) End: 07-23-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 7600, 7700_____
Cause Code: 1600__ Source Code(s): 7600, 7700_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix XIX. Taxa list for GRBOO-036 (unnamed tributary to Pond Creek) based on high-gradient, kicknet sampling.

Taxon			
CRUSTACEA			
	Asellidae		
		Caecidotea sp.	73
	Gammaridae		
		Gammarus sp.	1
COLEOPTERA			
	Elmidae		
		Stenelmis sp.	25
TRICHOPTERA			
	Hydropsychidae		
		Cheumatopsyche sp.	24
		Hydropsyche sp.	285
DIPTERA			
	Ceratopogonidae		
		Bezzia/Palpomyia sp.	4
		SUM	**412**

Appendix XX. Taxa list for GRBOO-036 (unnamed tributary to Pond Creek) based on high-gradient, multihabitat sampling.

Taxon			
CRUSTACEA			
	Asellidae		
		Caecidotea sp.	2
TRICHOPTERA			
	Hydropsychidae		
		Cheumatopsyche sp.	1
		Hydropsyche sp.	79
DIPTERA			
	Chironomidae		3
		SUM	**85**

Appendix XI. Stream usage assessment for GRBOO-036.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: UNNAMED TRIBUTARY TO POND CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 501042 Segment No.: __ __Station ID: WKU0340 (GRBOO-036)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: POND CREEK

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110003

County 1: MUHLENBERG County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: DRAKESBORO

Latitude: 37.2422 Longitude: -87.0649 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-05-01 (mm-dd-yy) End: 07-05-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM				X	

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 5100_____
Cause Code: 1300__ Source Code(s): 5100_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix XXII. Taxa list for GRBOO-040 (unnamed tributary to West Fork Lewis Creek) based on high-gradient kicknet sampling.

Taxon			
OLIGOCHAETA			32
CRUSTACEA			
	Asellidae		
		Caecidotea sp.	367
	Cambaridae		
		Orconectes sp.	3
MOLLUSCA			
	Physidae		
		Physella sp.	16
	Sphaeriidae		
		Pisidium sp.	2
PLECOPTERA			
	Perlidae		
		immature perlid	4
HEMIPTERA			
	Corixidae		
		immature corixid	8
	Nepidae		
		Nepa sp.	8
	Notonectidae		
		immature notonectid	1
NEUROPTERA			
	Sialidae		
		Sialis sp.	5
TRICHOPTERA			
	Hydropsychidae		
		Cheumatopsyche sp.	194
COLEOPTERA			
	Elmidae		
		Stenelmis sp.	12
	Hydrophilidae		
		Hydrobius sp.	19
DIPTERA			
	Ceratopogonidae		
		Bezzia/Palpomyia sp.	1
	Chironomidae		227
	Tabanidae		
		Chrysops sp.	16

Appendix XXII. Cont.

Taxon		
Tipulidae		
	Pilaria sp.	5
	SUM	**920**

Appendix XXIII. Taxa list for GRBOO-040 (unnamed tributary to West Fork Lewis Creek) based on high-gradient multihabitat sampling.

Taxon			
OLIGOCHAETA			
CRUSTACEA			
	Asellidae		
		Caecidotea sp.	77
		Lirceus sp.	3
	Cambaridae		
		immature cambarid	6
ODONATA			
	Libellulidae		
		Somatochlora sp.	2
HEMIPTERA			
	Corixidae		
		immature corixid	4
TRICHOPTERA			
	Hydropsychidae		
		Cheumatopsyche sp.	1
COLEOPTERA			
	Dytiscidae		
		Hydroporus sp.	4
DIPTERA			
	Chironomidae		39
	Tipulidae		
		immature tipulid	1
		SUM	**137**

Appendix XXIV. Stream usage assessment for GRBOO-040.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: UNNAMED TRIBUTARY TO WEST FORK LEWIS CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 506436 Segment No.: __ __Station ID: WKU0341 (GRBOO-040)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: WEST FORK LEWIS CREEK

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110003

County 1: OHIO County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: EQUALITY

Latitude: 37.3777 Longitude: -87.0026 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-10-01 (mm-dd-yy) End: 07-10-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 7550_____
Cause Code: 1600__ Source Code(s): 7550_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix XXV. Taxa list for GRBOO-049 (Old Panther Creek) based on high-gradient kicknet sampling.

Taxon			
OLIGOCHAETA			14
CRUSTACEA			
	Asellidae		
		Lirceus sp.	96
MOLLUSCA			
	Physidae		
		Physella sp.	4
	Sphaeriidae		
		Sphaerium sp.	12
EPHEMEROPTERA			
	Caenidae		
		Caenis sp.	7
ODONATA			
	Coenagrionidae		
		Argia sp.	2
HEMIPTERA			
	Gerridae		
		Rheumatobates sp.	4
	Veliidae		
		Steinovelia sp.	6
MEGALOPTERA			
	Corydalidae		
		Chauliodes sp.	1
LEPIDOPTERA			
	Pyralidae		
		Acentria sp.	2
COLEOPTERA			
	Hydrophilidae		
		Berosus sp.	1
DIPTERA			
	Ceratopogonidae		
		immature ceratopogonid	20
	Chironomidae		183
		SUM	**352**

Appendix XXVI. Taxa list for GRBOO-049 (Old Panther Creek) based on high-gradient multihabitat sampling.

Taxon			
OLIGOCHAETA			1
CRUSTACEA			
	Asellidae		
		Caecidotea sp.	64
		Lirceus sp.	1
MOLLUSCA			
	Sphaeriidae		
		Sphaerium sp.	3
EPHEMEROPTERA			
	Caenidae		
		Caenis sp.	2
ODONATA			
	Coenagrionidae		
		Enallagma sp.	2
COLEOPTERA			
	Hydrophilidae		
		Berosus sp.	1
		Tropisternus sp.	1
DIPTERA			
	Ceratopogonidae		
		immature ceratopogonid	1
	Chironomidae		218
		SUM	**294**

Appendix XXVII. Stream usage assessment for GRBOO-049.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: OLD PANTHER CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 499866 Segment No.: __ __Station ID: WKU0342 (GRBOO-049)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: PANTHER CREEK

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110005

County 1: DAVIESS County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: PANTHER

Latitude: 37.6775 Longitude: 87.2049 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 08-31-01 (mm-dd-yy) End: 08-31-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT				X	
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 7550_____
Cause Code: 1600__ Source Code(s): 7550_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix XXVIII. Taxa list for GRBOO-064 (Ward Creek) based on high-gradient, kicknet sampling.

Taxon		
CRUSTACEA		
	Asellidae	
		Lirceus sp. 5
	Cambaridae	
		Orconectes sp. 3
MOLLUSCA		
	Physidae	
		Physella sp. 12
	Pleuroceridae	
		Elimia sp. 2
		Pleurocera sp. 9
EPHEMEROPTERA		
	Baetidae	
		Callibaetis sp. 1
		Procloeon sp. 1
	Caenidae	
		Caenis sp. 12
	Heptageniidae	
		Stenonema sp. 2
HEMIPTERA		
	Corixidae	
		immature corixid 3
	Gelastocoridae	
		Gelastocoris sp. 1
	Veliidae	
		Microvelia sp. 2
MEGALOPTERA		
	Corydalidae	
		Nigronia sp. 1
NEUROPTERA		
	Sialidae	
		Sialis sp. 1
COLEOPTERA		
	Dryopidae	
		Helichus sp. 1
	Dytiscidae	
		Hydroporus sp. 17

Appendix XXVIII. Cont.

Taxon			
	Elmidae		
		Stenelmis sp.	26
	Haliplidae		
		Peltodytes sp.	3
	Hydrophilidae		
		Anacaena sp.	2
		Enochrus sp.	1
		Hydrobius sp.	14
		Laccobius sp.	5
		Tropisternus sp.	2
	Scirtidae		
		Elodes sp.	5
DIPTERA			
	Ceratopogonidae		
		Probezzia sp.	1
	Chironomidae		164
	Culicidae		
		Anopheles sp.	1
	Stratiomyidae		
		Stratiomys sp.	4
		SUM	**301**

Appendix XXIX. Taxa list for GRBOO-064 (Ward Creek) based on high- gradient, multihabitat sampling.

Taxon			
OLIGOCHAETA			1
CRUSTACEA			
	Asellidae		
		Caecidotea sp.	18
		Lirceus sp.	2
MOLLUSCA			
	Planorbidae		
		Helisoma sp.	2
	Pleuroceridae		
		Pleurocera sp.	202
	Sphaeriidae		
		Sphaerium sp.	3
EPHEMEROPTERA			
	Baetidae		
		Procloeon sp.	1
	Caenidae		
		Caenis sp.	12
	Heptageniidae		
		Stenacron sp.	1
		Stenonema sp.	32
ODONATA			
	Aeshnidae		
		Boyeria sp.	1
	Coenagrionidae		
		Enallagma sp.	1
	Libellulidae		
		Somatochlora sp.	1
		immature libellulid	2
COLEOPTERA			
	Psephenidae		
		Ectopria nervosa	1
DIPTERA			
	Chironomidae		17
		SUM	**297**

Appendix XXX. Stream usage assessment for GRBOO-064.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: WARD CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 506219 Segment No.: __ __Station ID: WKU1003 (GRBOO-064)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: FLYNN FORK

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05140205

County 1: CALDWELL County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: PRINCETON EAST

Latitude: 37.1001 Longitude: -87.8070 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-24-01 (mm-dd-yy) End: 07-24-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 7550_____
Cause Code: 1600__ Source Code(s): 7550_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix XXXI. Taxa list for GRBOO-067 (Crooked Creek) based on high- gradient, kicknet sampling.

Taxon		
OLIGOCHAETA		24
HIRUDINEA		5
CRUSTACEA		
	Asellidae	
		Caecidotea sp. 6
	Cambaridae	
		Orconectes sp. 12
MOLLUSCA		
	Corbiculiidae	
		Corbicula fluminea 4
	Planorbidae	
		Helisoma sp. 6
	Pleuroceridae	
		Elimia sp. 38
	Sphaeriidae	
		Pisidium sp. 1
		Sphaerium sp. 6
EPHEMEROPTERA		
	Baetidae	
		immature baetid 1
	Caenidae	
		Caenis sp. 56
	Heptageniidae	
		Stenonema sp. 6
PLECOPTERA		
	Perlidae	
		Neoperla sp. 8
HEMIPTERA		
	Veliidae	
		Microvelia sp. 2
NEUROPTERA		
	Sialidae	
		Sialis sp. 1
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 291

Appendix XXXI. Cont.

Taxon		
COLEOPTERA		
Dryopidae		
	Helichus sp.	5
Elmidae		
	Ancyronyx variegatus	1
	Dubiraphia sp.	4
	Stenelmis sp.	222
Haliplidae		
	Peltodytes sp.	9
Hydrophilidae		
	Berosus sp.	1
	Tropisternus sp.	2
DIPTERA		
Ceratopogonidae		
	Atrichopogon sp.	1
Chironomidae		341
Empididae		
	Hemerodromia sp.	4
Tipulidae		
	Hexatoma sp.	3
	Limonia sp.	6
	Pseudolimnophila sp.	1
	SUM	**1067**

Appendix XXXII. Taxa list for GRBOO-067 (Crooked Creek) based on high-gradient, multihabitat sampling.

Taxon		
PLATYHELMINTHES		
	Planariidae	
		Dugesia sp. 1
HIRUDINEA		1
CRUSTACEA		
	Talitridae	
		Hyalella azteca 24
MOLLUSCA		
	Physidae	
		Physella sp. 16
	Planorbidae	
		Helisoma sp. 15
	Pleuroceridae	
		Elimia sp. 13
		Pleurocera sp. 3
EPHEMEROPTERA		
	Baetidae	
		Callibaetis sp. 2
		Centroptilum sp. 1
	Caenidae	
		Caenis sp. 27
	Heptageniidae	
		Stenacron sp. 37
		Stenonema sp. 11
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 12
	Hydroptilidae	
		Hydroptila sp. 4
COLEOPTERA		
	Elmidae	
		Ancyronyx variegatus 2
		Dubiraphia sp. 7
		Stenelmis sp. 2
	Gyrinidae	
		Dineutus sp. 2
	Haliplidae	
		Peltodytes sp. 4

Appendix XXXII. Cont.

Taxon			
	Hydrophilidae		
		Berosus sp.	9
		Tropisternus sp.	1
DIPTERA			
	Chironomidae		85
	Tipulidae		
		Limonia sp.	2
		SUM	**281**

Appendix XXXIII. Stream usage assessment for GRBOO-067.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: CROOKED CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 511649 Segment No.: __ __Station ID: WKU0802 (GRBOO-067)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: OHIO RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05140203

County 1: CRITTENDEN County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: REPTON

Latitude: 37.4312 Longitude: -88.0938 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-11-01 (mm-dd-yy) End: 07-11-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 7550_____
Cause Code: 1600__ Source Code(s): 7550_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix XXXIV. Taxa list for GRBOO-068 (East Branch Pond River) based on high-gradient, kicknet sampling.

Taxon		
OLIGOCHAETA		268
CRUSTACEA		
	Cambaridae	
		Orconectes sp. 8
MOLLUSCA		
	Corbiculiidae	
		Corbicula fluminea 70
	Sphaeriidae	
		Sphaerium sp. 6
EPHEMEROPTERA		
	Baetidae	
		Acerpenna sp. 87
		Baetis sp. 503
	Heptageniidae	
		Stenacron sp. 31
		Stenonema sp. 30
	Tricorythidae	
		Tricorythodes sp. 32
ODONATA		
	Coenagrionidae	
		Argia sp. 10
	Libellulidae	
		Macromia sp. 1
PLECOPTERA		
	Perlidae	
		Acroneuria sp. 2
MEGALOPTERA		
	Corydalidae	
		Corydalus cornutus 18
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 2118
		Hydropsyche sp. 53
	Hydroptilidae	
		Hydroptila sp. 7
	Leptoceridae	
		Ceraclea sp. 3

Appendix XXIV. Cont.

Taxon			
	Philopotamidae		
		Chimarra sp.	1967
	Polycentropodidae		
		Cyrnellus fraternus	1
LEPIDOPTERA			
	Pyralidae		
		Petrophila confusalis	7
COLEOPTERA			
	Dryopidae		
		Helichus sp.	1
	Elmidae		
		Dubiraphia sp.	1
		Stenelmis sp.	4921
DIPTERA			
	Chironomidae		829
	Empididae		
		Hemerodromia sp.	35
	Simuliidae		
		Simulium sp.	2
	Stratiomyidae		
		Odontomyia sp.	1
		SUM	**11012**

Appendix XXXV. Taxa list for GRBOO-068 (East Branch Pond River) based on high-gradient, multihabitat sampling.

Taxon		
MOLLUSCA		
	Corbiculiidae	
		Corbicula fluminea 18
	Pleuroceridae	
		Elimia sp. 8
EPHEMEROPTERA		
	Baetidae	
		Acerpenna sp. 4
		Baetis sp. 45
	Caenidae	
		Caenis sp. 7
	Ephemerellidae	
		Drunella sp. 2
	Heptageniidae	
		Stenacron sp. 3
		Stenonema sp. 1
		immature heptageniid 3
	Tricorythidae	
		Tricorythodes sp. 6
ODONATA		
	Coenagrionidae	
		Argia sp. 5
		Enallagma sp. 1
HEMIPTERA		
	Corixidae	
		immature corixid 1
MEGALOPTERA		
	Corydalidae	
		Corydalus cornutus 1
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 101
		Hydropsyche sp. 13
		immature hydropsychid 22
	Hydroptilidae	
		Hydroptila sp. 1
	Philopotamidae	
		Chimarra sp. 37

Appendix XXXV. Cont.

Taxon			
LEPIDOPTERA			
	Pyralidae		
		Petrophila confusalis	2
COLEOPTERA			
	Elmidae		
		Dubiraphia sp.	2
		Stenelmis sp.	94
DIPTERA			
	Chironomidae		248
	Empididae		
		Hemerodromia sp.	6
		SUM	**631**

Appendix XXXVI. Stream usage assessment for GRBOO-068.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: EAST BRANCH POND RIVER (Stream must be on 1:100k map)

GNIS Feature ID: 491428 Segment No.: __ __Station ID: WKU0343 (GRBOO-068)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: POND RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 5110006

County 1: CHRISTIAN County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: HALEYS MILL

Latitude: 37.0710 Longitude: -87.2727 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-25-01 (mm-dd-yy) End: 07-25-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL	X				
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix XXXVII. Taxa list for GRBOO-087 (unnamed tributary to Flat Creek) based on high-gradient, kicknet sampling.

Taxon			
OLIGOCHAETA			14
CRUSTACEA			
	Asellidae		
		Caecidotea sp.	61
		Lirceus sp.	1
	Talitridae		
		Hyalella azteca	17
MOLLUSCA			
	Physidae		
		Physella sp.	4
EPHEMEROPTERA			
	Caenidae		
		Caenis sp.	1
TRICHOPTERA			
	Hydropsychidae		
		Cheumatopsyche sp.	3
COLEOPTERA			
	Elmidae		
		Stenelmis sp.	2
DIPTERA			
	Chironomidae		2
	Tabanidae		
		Chrysops sp.	3
		SUM	**108**

Appendix XXXVIII. Taxa list for GRBOO-087 (unnamed tributary to Flat Creek) based on high-gradient, multihabitat sampling.

Taxon			
OLIGOCHAETA			1
CRUSTACEA			
	Asellidae		
		Caecidotea sp.	7
MOLLUSCA			
	Physidae		
		Physella sp.	50
	Pleuroceridae		
		Elimia sp.	16
		Pleurocera sp.	1
EPHEMEROPTERA			
	Baetidae		
		Callibaetis sp.	3
ODONATA			
	Coenagrionidae		
		Argia sp.	1
	Libellulidae		
		Macromia sp.	2
HEMIPTERA			
	Corixidae		
		immature corixid	1
COLEOPTERA			
	Haliplidae		
		Peltodytes sp.	1
	Hydrophilidae		
		Berosus sp.	1
		Tropisternus sp.	1
DIPTERA			
	Chironomidae		29
		SUM	**114**

Appendix XXXIX. Stream usage assessment for GRBOO-087.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: UNNAMED TRIBUTARY TO FLAT CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 492181 Segment No.: __ __Station ID: WKU0346 (GRBOO-087)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: FLAT CREEK

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 5110006

County 1: HOPKINS County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: MADISONVILLE EAST

Latitude: 37.2859 Longitude: -87.4289 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-30-01 (mm-dd-yy) End: 07-30-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM				X	

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 5100_____
Cause Code: 1300__ Source Code(s): 5100_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix XL. Taxa list for GRBOO-088 (unnamed tributary to Mays Run) based on high-gradient, kicknet sampling.

Taxon		
OLIGOCHAETA		12
CRUSTACEA		
	Asellidae	
		Caecidotea sp. 1
	Cambaridae	
		Orconectes sp. 2
	Gammaridae	
		Gammarus sp. 32
MOLLUSCA		
	Pleuroceridae	
		Elimia sp. 33
	Sphaeriidae	
		Sphaerium sp. 405
EPHEMEROPTERA		
	Baetidae	
		Acerpenna sp. 25
	Caenidae	
		Caenis sp. 8
	Heptageniidae	
		Stenacron sp. 31
		Stenonema sp. 75
ODONATA		
	Aeshnidae	
		Boyeria sp. 9
	Coenagrionidae	
		immature coenagrionid 4
	Gomphidae	
		Stylogomphus albistlyus 10
HEMIPTERA		
	Veliidae	
		Microvelia sp. 4
		Rhagovelia sp. 1
MEGALOPTERA		
	Corydalidae	
		Nigronia sp. 178
NEUROPTERA		
	Sialidae	
		Sialis sp. 3

Appendix XL. Cont.

Taxon			
TRICHOPTERA			
	Hydropsychidae		
		Cheumatopsyche sp.	381
		Hydropsyche sp.	24
	Philopotamidae		
		Chimarra sp.	17
COLEOPTERA			
	Dryopidae		
		Helichus sp.	3
	Elmidae		
		Dubiraphia sp.	1
		Optioservus sp.	164
		Stenelmis sp.	129
	Haliplidae		
		Peltodytes sp.	1
	Psephenidae		
		Ectopria nervosa	2
		Psephenus herricki	4
DIPTERA			
	Ceratopogonidae		
		immature ceratopogonid	1
	Chironomidae		325
	Empididae		
		Hemerodromia sp.	2
	Tabanidae		
		Tabanus sp.	9
	Tipulidae		
		Hexatoma sp.	1
		Tipula sp.	3
		SUM	**1900**

Appendix XLI. Taxa list for GRBOO-088 (unnamed tributary to Mays Run) based on high-gradient, multihabitat sampling.

Taxon			
OLIGOCHAETA			24
CRUSTACEA			
	Cambaridae		
		immature cambarid	2
MOLLUSCA			
	Pleuroceridae		
		Elimia sp.	125
		Pleurocera sp.	7
	Sphaeriidae		
		Sphaerium sp.	27
EPHEMEROPTERA			
	Baetidae		
		Acerpenna sp.	4
	Heptageniidae		
		Stenacron sp.	16
ODONATA			
	Coenagrionidae		
		Argia sp.	1
	Gomphidae		
		Gomphus sp.	1
MEGALOPTERA			
	Corydalidae		
		Nigronia sp.	1
NEUROPTERA			
	Sialidae		
		Sialis sp.	9
TRICHOPTERA			
	Helicopsychidae		
		Helicopsyche sp.	1
	Hydropsychidae		
		Cheumatopsyche sp.	5
		Hydropsyche sp.	3
	Philopotamidae		
		Chimarra sp.	1
	Polycentropodidae		
		Polycentropus sp.	2
	Psychomyiidae		
		Lype diversa	2

Appendix XLI. Cont.

Taxon			
COLEOPTERA			
	Dryopidae		
		Helichus sp.	1
	Dytiscidae		
		Hydroporus sp.	8
	Elmidae		
		Ancyronyx variegatus	2
		Dubiraphia sp.	1
		Macronychus glabratus	1
		Stenelmis sp.	1
	Haliplidae		
		Peltodytes sp.	1
	Psephenidae		
		Ectopria nervosa	1
		Psephenus herricki	1
DIPTERA			
	Ceratopogonidae		
		Bezzia/Palpomyia sp.	1
	Chironomidae		27
	Tipulidae		
		Tipula sp.	3
		SUM	**279**

Appendix XLII. Stream usage assessment for GRBOO-088.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: UNNAMED TRIBUTARY TO MAYS RUN (Stream must be on 1:100k map)

GNIS Feature ID: 497751 Segment No.: __ __Station ID: WKU0347 (GRBOO-088)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: MAYS RUN

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110004

County 1: HARDIN County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: HOWE VALLEY

Latitude: 37.7391 Longitude: -86.0833 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-17-01 (mm-dd-yy) End: 07-17-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL	X				
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix XLIII. Taxa list for GRBOO-089 (West Fork Drakes Creek) based on high-gradient, kicknet sampling.

Taxon			
OLIGOCHAETA			19
HIRUDINEA			2
CRUSTACEA			
	Asellidae		
		Lirceus sp.	13
	Cambaridae		
		Orconectes sp.	13
MOLLUSCA			
	Corbiculiidae		
		Corbicula fluminea	95
	Pleuroceridae		
		Elimia sp.	20
EPHEMEROPTERA			
	Baetidae		
		Baetis sp.	152
	Caenidae		
		Caenis sp.	130
	Heptageniidae		
		Stenonema sp.	382
	Isonychiidae		
		Isonychia sp.	347
	Tricorythidae		
		Tricorythodes sp.	38
ODONATA			
	Coenagrionidae		
		Argia sp.	29
MEGALOPTERA			
	Corydalidae		
		Corydalus cornutus	1
		Nigronia sp.	2
NEUROPTERA			
	Sialidae		
		Sialis sp.	7
TRICHOPTERA			
	Hydropsychidae		
		Cheumatopsyche sp.	173
		Hydropsyche sp.	11
	Philopotamidae		
		Chimarra sp.	28

Appendix XLIII. Cont.

Taxon			
COLEOPTERA			
	Elmidae		
		Optioservus sp.	1
		Stenelmis sp.	546
	Psephenidae		
		Psephenus herricki	133
	Ptilodactylidae		
		Anchytarsus bicolor	1
DIPTERA			
	Chironomidae		41
			SUM 2184

Appendix XLIV. Taxa list for GRBOO-089 (West Fork Drakes Creek) based on high-gradient, multihabitat sampling.

Taxon		
HYDRACARINA		1
CRUSTACEA		
	Asellidae	
		Lirceus sp. 8
MOLLUSCA		
	Corbiculiidae	
		Corbicula fluminea 6
	Planorbidae	
		Helisoma sp. 1
	Pleuroceridae	
		Elimia sp. 105
EPHEMEROPTERA		
	Baetidae	
		Baetis sp. 3
	Caenidae	
		Caenis sp. 1
	Heptageniidae	
		Stenacron sp. 9
		Stenonema sp. 21
		immature heptageniid 3
	Isonychiidae	
		Isonychia sp. 2
	Tricorythidae	
		Tricorythodes sp. 5
ODONATA		
	Calopterygidae	
		Hetaerina sp. 2
	Coenagrionidae	
		Argia sp. 4
		Enallagma sp. 7
	Libellulidae	
		immature libellulid 1
HEMIPTERA		
	Veliidae	
		Mesovelia sp. 1
TRICHOPTERA		
	Brachycentridae	
		Micrasema sp. 1

Appendix XLIV. Cont.

Taxon			
	Hydropsychidae		
		Cheumatopsyche sp.	17
		Hydropsyche sp.	11
		immature hydropsychid	4
	Leptoceridae		
		Triaenodes sp.	3
	Philopotamidae		
		Chimarra sp.	1
	Polycentropodidae		
		Nyctiophylax sp.	1
	Psychomyiidae		
		Lype diversa	1
COLEOPTERA			
	Elmidae		
		Ancyronyx variegatus	7
		Dubiraphia sp.	16
		Macronychus glabratus	66
		Stenelmis sp.	11
	Haliplidae		
		Peltodytes sp.	1
	Hydrophilidae		
		Berosus sp.	1
	Psephenidae		
		Psephenus herricki	3
DIPTERA			
	Chironomidae		42
	Dixidae		
		Dixella sp.	1
		SUM	**367**

Appendix XLV. Stream usage assessment for GRBOO-089.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: WEST FORK DRAKES CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 506431 Segment No.: __ __Station ID: WKU0348 (GRBOO-089)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: DRAKES CREEK

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110002

County 1: SIMPSON County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: WOODBURN

Latitude: 36.7533 Longitude: -86.5489 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-18-01 (mm-dd-yy) End: 07-18-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT	X				
BIOLOGICAL	X				
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix XLVI. Taxa list for GRBOO-097 (Beaverdam Creek) based on high-gradient, kicknet sampling.

Taxon		
OLIGOCHAETA		47
CRUSTACEA		
	Cambaridae	
		Orconectes sp. 3
MOLLUSCA		
	Pleuroceridae	
		Elimia sp. 1
	Sphaeriidae	
		Sphaerium sp. 17
EPHEMEROPTERA		
	Baetidae	
		Baetis sp. 6
		immature baetid 1
	Caenidae	
		Caenis sp. 4
	Ephemeridae	
		Ephemera sp. 11
		Hexagenia sp. 1
	Heptageniidae	
		Stenacron sp. 11
		Stenonema sp. 19
	Isonychiidae	
		Isonychia sp. 2
	Leptophlebiidae	
		immature leptophlebiid 1
ODONATA		
	Aeshnidae	
		Boyeria sp. 2
	Calopterygidae	
		Hetaerina sp. 3
	Gomphidae	
		Gomphus sp. 6
		Stylogomphus albistylus 1
PLECOPTERA		
	Leuctridae	
		Leuctra sp. 1

Appendix XLVI. Cont.

Taxon		
HEMIPTERA		
	Veliidae	
		Microvelia sp. 1
MEGALOPTERA		
	Corydalidae	
		Nigronia sp. 29
NEUROPTERA		
	Sialidae	
		Sialis sp. 40
TRICHOPTERA		
	Brachycentridae	
		Micrasema sp. 2
	Hydropsychidae	
		Cheumatopsyche sp. 55
		Hydropsyche sp. 5
	Leptoceridae	
		Oecetis sp. 1
	Philopotamidae	
		Chimarra sp. 1
	Polycentropodidae	
		Cyrnellus fraternus 2
COLEOPTERA		
	Dryopidae	
		Helichus sp. 2
	Elmidae	
		Dubiraphia sp. 34
		Macronychus glabratus 2
		Microcylloepus pusillus 12
		Optioservus sp. 20
		Promoresia sp. 6
		Stenelmis sp. 4
	Haliplidae	
		Peltodytes sp. 2
	Psephenidae	
		Ectopria nervosa 2
		Psephenus herricki 2
	Scirtidae	
		Elodes sp. 1

Appendix XLVI. Cont.

Taxon		
DIPTERA		
	Ceratopogonidae	
		Bezzia/Palpomyia sp. 5
	Chironomidae	1795
	Empididae	
		Hemerodromia sp. 3
	Tabanidae	
		Chrysops sp. 1
	Tipulidae	
		Pseudolimnophila sp. 4
		Tipula sp. 10
		SUM 2178

Appendix XLVII. Taxa list for GRBOO-097 (Beaverdam Creek) based on high-gradient, multihabitat sampling.

Taxon		
OLIGOCHAETA		20
CRUSTACEA		
	Cambaridae	
		immature cambarid 1
MOLLUSCA		
	Physidae	
		Physella sp. 9
	Pleuroceridae	
		Elimia sp. 291
		Pleurocera sp. 1
	Sphaeriidae	
		Sphaerium sp. 4
EPHEMEROPTERA		
	Caenidae	
		Caenis sp. 1
	Heptageniidae	
		Stenacron sp. 11
		Stenonema sp. 5
ODONATA		
	Aeshnidae	
		Boyeria sp. 1
	Coenagrionidae	
		Argia sp. 1
MEGALOPTERA		
	Corydalidae	
		Nigronia sp. 1
LEPIDOPTERA		
	Pyralidae	
		Munroessa/Synclita sp. 3
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 1
	Polycentropodidae	
		Nyctiophylax sp. 1
	Psychomyiidae	
		Psychomyia sp. 2

Appendix XLVII. Cont.

Taxon			
COLEOPTERA			
	Elmidae		
		Ancyronyx variegatus	1
		Dubiraphia sp.	5
		Macronychus glabratus	2
		Stenelmis sp.	1
	Psephenidae		
		Psephenus herricki	1
DIPTERA			
	Ceratopogonidae		
		Bezzia/Palpomyia sp.	
	Chironomidae		89
	Tabanidae		
		Chrysops sp.	1
	Tipulidae		
		Tipula sp.	2
		SUM	**455**

Appendix XLVIII. Stream usage assessment for GRBOO-097.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: BEAVERDAM CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 486628 Segment No.: __ __Station ID: WKU0349 (GRBOO-097)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: GREEN RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110001

County 1: EDMONSON County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: SMITHS GROVE

Latitude: 37.1218 Longitude: -86.1936 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-18-01 (mm-dd-yy) End: 07-18-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix XLIX. Taxa list for GRBOO-102 (Bear Creek) based on high-gradient, kicknet sampling.

Taxon		
OLIGOCHAETA		8
HIRUDINEA		3
CRUSTACEA		
	Cambaridae	
		Orconectes sp. 12
MOLLUSCA		
	Corbiculiidae	
		Corbicula fluminea 12
	Physidae	
		Physella sp. 2
	Planorbidae	
		Helisoma sp. 1
	Sphaeriidae	
		Sphaerium sp. 617
EPHEMEROPTERA		
	Baetidae	
		Baetis sp. 11
ODONATA		
	Aeshnidae	
		Boyeria sp. 2
	Coenagrionidae	
		Argia sp. 1
	Gomphidae	
		Stylogomphus albistylus 1
MEGALOPTERA		
	Corydalidae	
		Corydalus cornutus 3
		Nigronia sp. 1
NEUROPTERA		
	Sialidae	
		Sialis sp. 2
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 7253
		Hydropsyche sp. 5
	Hydroptilidae	
		Hydroptila sp. 3
COLEOPTERA		
	Elmidae	
		Stenelmis sp. 42

Appendix XLIX. Cont.

Taxon			
	Ptilodactylidae		
		Anchytarsus bicolor	1
DIPTERA			
	Ceratopogonidae		
		Probezzia sp.	1
	Chironomidae		5144
	Empididae		
		Hemerodromia sp.	23
	Simuliidae		
		Simulium sp.	2
		SUM	**13150**

Appendix L. Taxa list for GRBOO-102 (Bear Creek) based on high-gradient, multihabitat sampling.

Taxon		
PLATYHELMINTHES		
	Planariidae	
		Dugesia sp. 3
OLIGOCHAETA		2
HIRUDINEA		1
HYDRACARINA		1
CRUSTACEA		
	Cambaridae	
		immature cambarid 1
	Talitridae	
		Hyallela azteca 1
MOLLUSCA		
	Planorbidae	
		Helisoma sp. 2
	Sphaeriidae	
		Sphaerium sp. 12
EPHEMEROPTERA		
	Baetidae	
		Baetis sp. 13
	Heptageniidae	
		Stenacron sp. 2
		Stenonema sp. 2
ODONATA		
	Coenagrionidae	
		Argia sp. 4
		Enallagma sp. 3
HEMIPTERA		
	Veliidae	
		Mesovelia sp. 6
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 420
		Hydropsyche sp. 1
		immature hydropsychid 64
	Hydroptilidae	
		Hydroptila sp. 10
COLEOPTERA		
	Elmidae	
		Ancyronyx variegatus 2
		Dubiraphia sp. 14
		Stenelmis sp. 1

Appendix L. Cont.

Taxon			
	Hydrophilidae		
		Berosus sp.	3
		Tropisternus sp.	4
DIPTERA			
	Chironomidae		957
	Simuliidae		
		Simulium sp.	1
	Tabanidae		
		immature tabanid	1
		SUM	**1531**

Appendix LI. Stream usage assessment for GRBOO-102.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: BEAR CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 486554 Segment No.: __ __Station ID: WKU0351 (GRBOO-102)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: GREEN RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110001

County 1: GRAYSON County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: BEE SPRING

Latitude: 37.3617 Longitude: -86.3021 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-18-01 (mm-dd-yy) End: 07-18-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 7600, 7700_____
Cause Code: 1600__ Source Code(s): 7600, 7700_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LII. Taxa list for GRBOO-103 (Sycamore Branch) based on high-gradient, kicknet sampling.

Taxon			
CRUSTACEA			
	Asellidae		
		Lirceus sp.	15
	Cambaridae		
		Orconectes sp.	5
HEMIPTERA			
	Veliidae		
		Microvelia sp.	1
MEGALOPTERA			
	Corydalidae		
		Nigronia sp.	32
NEUROPTERA			
	Sialidae		
		Sialis sp.	3
TRICHOPTERA			
	Hydropsychidae		
		Cheumatopsyche sp.	80
COLEOPTERA			
	Dryopidae		
		Helichus sp.	1
	Dytiscidae		
		Celina sp.	1
		Hydroporus sp.	1
	Hydrophilidae		
		Hydrobius sp.	2
DIPTERA			
	Chironomidae		117
	Empididae		
		Hemerodromia sp.	1
	Tipulidae		
		Limonia sp.	23
		Pseudolimnophila sp.	4
		Tipula sp.	7
		SUM	**293**

Appendix LIII. Taxa list for GRBOO-103 (Sycamore Branch) based on high-gradient, kicknet sampling.

Taxon			
EPHEMEROPTERA			
	Baetidae		
		Procloeon sp,	1
	Ephemerellidae		
		immature ephemerellid	1
	Heptageniidae		
		Stenonema sp.	2
MEGALOPTERA			
	Corydalidae		
		Nigronia sp.	1
TRICHOPTERA			
	Hydropsychidae		
		Diplectrona modesta	4
	Rhyacophilidae		
		Rhyacophila sp.	2
COLEOPTERA			
	Hydrophilidae		
		Helocombus sp.	1
DIPTERA			
	Ceratopogonidae		
		Atrichopogon sp.	1
		Dasyhelea sp.	1
	Chironomidae		2
	Tipulidae		
		Limonia sp.	1
		immature tipulid	1
		SUM	**18**

Appendix LIV. Stream usage assessment for GRBOO-103.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: SYCAMORE BRANCH (Stream must be on 1:100k map)

GNIS Feature ID: 504864 Segment No.: __ __Station ID: WKU0352 (GRBOO-103)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: BEAR CREEK

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110001

County 1: EDMONSON County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: BEE SPRING

Latitude: 37.2738 Longitude: -86.3128 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-18-01 (mm-dd-yy) End: 07-18-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 7550_____
Cause Code: 1600__ Source Code(s): 7550_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LV. Taxa list for GRBOO-106 (South Fork Little Barren River) based on high-gradient, kicknet sampling.

Taxon			
OLIGOCHAETA			13
MOLLUSCA			
	Physidae		
		Physella sp.	2
	Pleuroceridae		
		Elimia sp.	184
EPHEMEROPTERA			
	Baetidae		
		Baetis sp.	103
		Procloeon sp.	12
	Caenidae		
		Caenis sp.	16
	Heptageniidae		
		Stenonema sp.	39
	Isonychiidae		
		Isonychia sp.	47
	Tricorythidae		
		Tricorythodes sp.	53
HEMIPTERA			
	Veliidae		
		Mesovelia sp.	17
		Rhagovelia sp.	5
MEGALOPTERA			
	Corydalidae		
		Nigronia sp.	2
NEUROPTERA			
	Sialidae		
		Sialis sp.	1
TRICHOPTERA			
	Hydropsychidae		
		Cheumatopsyche sp.	147
		Hydropsyche sp.	5
COLEOPTERA			
	Elmidae		
		Stenelmis sp.	1108
DIPTERA			
	Chironomidae		574
	Empididae		
		Hemerodromia sp.	13

Appendix LV. Cont.

Taxon		
Simuliidae		
	Simulium sp.	4
Stratomyiidae		
	Odontomyia sp.	1
Tipulidae		
	Limnophila sp.	1
	SUM	**2347**

Appendix LVI. Taxa list for GRBOO-106 (South Fork Little Barren River) based on high-gradient, multihabitat sampling.

Taxon			
OLIGOCHAETA			6
MOLLUSCA			
	Corbiculiidae		
		Corbicula fluminea	1
	Pleuroceridae		
		Elimia sp.	59
EPHEMEROPTERA			
	Baetidae		
		Baetis sp.	3
		Procloeon sp.	1
	Caenidae		
		Caenis sp.	9
	Ephemerellidae		
		Serratella sp.	1
	Heptageniidae		
		Stenonema sp.	7
	Tricorythidae		
		Tricorythodes sp.	4
ODONATA			
	Calopterygidae		
		Hetaerina sp.	2
	Coenagrionidae		
		Enallagma sp.	3
PLECOPTERA			
	Leuctridae		
		Leuctra sp.	1
MEGALOPTERA			
	Corydalidae		
		Corydalus cornutus	1
TRICHOPTERA			
	Hydropsychidae		
		Cheumatopsyche sp.	18
		Hydropsyche sp.	5
		unidentified hydropsychid	2
	Hydroptilidae		
		Hydroptila sp.	1
	Leptoceridae		
		Oecetis sp.	1
	Polycentropodidae		
		Cernotina sp.	1

Appendix LVI. Cont.

Taxon			
COLEOPTERA			
	Elmidae		
		Ancyronyx variegatus	19
		Dubiraphia sp.	7
		Macronychus glabratus	19
		Stenelmis sp.	7
	Hydrophilidae		
		Berosus sp.	1
DIPTERA			
	Ceratopogonidae		
		Bezzia/Palpomyia sp.	1
	Chironomidae		232
	Empididae		
		Hemerodromia sp.	3
	Simuliidae		
		Simulium sp.	3
		SUM	**418**

Appendix LVII. Stream usage assessment for GRBOO-106.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: SOUTH FORK LITTLE BARREN RIVER (Stream must be on 1:100k map)

GNIS Feature ID: 503933 Segment No.: __ __Station ID: WKU0355 (GRBOO-106)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: LITTLE BARREN RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110001

County 1: METCALFE County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: SULPHUR WELL

Latitude: 37.0430 Longitude: -85.6408 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-16-01 (mm-dd-yy) End: 07-16-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT	X				
BIOLOGICAL	X				
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LVIII. Taxa list for GRBOO-109 (East Fork Little Barren River) based on high-gradient, kick-net sampling.

Taxon			
OLIGOCHAETA			4
HYDROCARINA			22
MOLLUSCA			
	Physidae		
		Physella sp.	2
	Pleuroceridae		
		Elimia sp.	184
EPHEMEROPTERA			
	Baetidae		
		Baetis sp.	3
		Procloeon sp.	12
	Caenidae		
		Caenis sp.	16
	Heptageniidae		
		Stenonema sp.	4
	Isonychiidae		
		Isonychia sp.	1
	Tricorythidae		
		Tricorythodes sp.	2
ODONATA			
	Coenagrionidae		
		Argia sp.	1
HEMIPTERA			
	Gerridae		
		Trepobates sp.	10
	Veliidae		
		Mesovelia sp.	17
		Rhagovelia sp.	5
MEGALOPTERA			
	Corydalidae		
		Nigronia sp.	2
NEUROPTERA			
	Sialidae		
		Sialis sp.	1
TRICHOPTERA			
	Hydropsychidae		
		Cheumatopsyche sp.	147
		Hydropsyche sp.	5
	Hydroptilidae		
		Hydroptila sp.	1

Appendix LVIII. Cont.

Taxon			
COLEOPTERA			
	Elmidae		
		Dubiraphia sp.	1
		Stenelmis sp.	42
	Hydrophilidae		
		Berosus sp.	1
		Laccobius sp.	2
	Lutrochidae		
		Lutrochus sp.	3
	Psephenidae		
		Psephenus herricki	4
DIPTERA			
	Chironomidae		574
	Empididae		
		Hemerodromia sp.	5
	Stratiomyiidae		
		Odontomyia sp.	1
		SUM	**1072**

Appendix LIX. Taxa list for GRBOO-109 (East Fork Little Barren River) based on high-gradient, multihabitat sampling.

Taxon			
MOLLUSCA			
	Physidae		
		Physella sp.	2
	Pleuroceridae		
		Elimia sp.	97
EPHEMEROPTERA			
	Baetidae		
		Baetis sp.	2
	Caenidae		
		Caenis sp.	12
	Heptageniidae		
		Stenacron sp.	4
		Stenonema sp.	33
		immature heptageniid	1
ODONATA			
	Coenagrionidae		
		Argia sp.	1
PLECOPTERA			
	Perlidae		
		Acroneuria sp.	1
TRICHOPTERA			
	Hydropsychidae		
		Cheumatopsyche sp.	18
	Uenoidae		
		Neophylax sp.	2
COLEOPTERA			
	Elmidae		
		Stenelmis sp.	9
	Psephenidae		
		Psephenus herricki	3
DIPTERA			
	Chironomidae		153
	Psychodidae		
		Psychoda sp.	1
		SUM	**339**

Appendix LX. Stream usage assessment for GRBOO-109.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: EAST FORK LITTLE BARREN RIVER (Stream must be on 1:100k map)

GNIS Feature ID: 491648 Segment No.: __ __Station ID: WKU0356 (GRBOO-109)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: LITTLE BARREN RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110001

County 1: METCALFE County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: EDMONTON

Latitude: 36.9439 Longitude: -85.5011 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-16-01 (mm-dd-yy) End: 07-16-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 1050_____
Cause Code: 1600__ Source Code(s): 7550_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LXI. Taxa list for GRBOO-110 (Bayou Creek) based on high- gradient, kicknet sampling.

Taxon		
OLIGOCHAETA		52
HIRUDINEA		50
CRUSTACEA		
	Asellidae	
		Lirceus sp. 409
	Talitridae	
		Hyalella azteca 4
MOLLUSCA		
	Ancylidae	
		Laevapex sp. 9
	Hydrobiidae	
		Somatogyrus sp. 9
	Physidae	
		Physella sp. 10
	Planorbidae	
		Helisoma sp. 8
	Sphaeriidae	
		Pisidium sp. 79
		Sphaerium sp. 606
ODONATA		
	Libellulidae	
		Neurocordulia sp. 3
HEMIPTERA		
	Corixidae	
		immature corixid 3
NEUROPTERA		
	Sialidae	
		Sialis sp. 10
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 1
COLEOPTERA		
	Dryopidae	
		Helichus sp. 1
	Elmidae	
		Dubiraphia sp. 1
		Stenelmis sp. 1

Appendix XLI. Cont.

Taxon	
DIPTERA	
Chironomidae	233
SUM	**1489**

Appendix LXII. Taxa list for GRBOO-110 (Bayou Creek) based on high- gradient, multihabitat sampling.

Taxon			
OLIGOCHAETA			2
CRUSTACEA			
	Asellidae		
		Lirceus sp.	2
	Cambaridae		
		immature cambarid	2
	Crangonyctidae		
		Crangonyx sp.	10
	Talitridae		
		Hyalella azteca	1
MOLLUSCA			
	Ancylidae		
		Ferrissia sp.	6
	Hydrobiidae		
		Amnicola sp.	2
	Physidae		
		Physella sp.	2
	Sphaeriidae		
		Pisidium sp.	6
		Sphaerium sp.	2
HEMIPTERA			
	Corixidae		
		immature corixid	11
NEUROPTERA			
	Sialidae		
		Sialis sp.	1
COLEOPTERA			
	Haliplidae		
		Peltodytes sp.	1
DIPTERA			
	Chironomidae		188
	Tipulidae		
		Pseudolimnophila sp.	1
		SUM	**237**

Appendix LXIII. Stream usage assessment for GRBOO-110.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: BAYOU CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 510435 Segment No.: __ __Station ID: WKU0804 (GRBOO-110)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: OHIO RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 5140203

County 1: LIVINGSTON County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: GOLCONDA

Latitude: 37.2872 Longitude: -88.4718 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-30-01 (mm-dd-yy) End: 07-30-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT				X	
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 7550_____
Cause Code: 1600__ Source Code(s): 7550_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LXIV. Taxa list for GRBOO-001 (Old Panther Creek) based on low- gradient, multihabitat sampling.

Taxon			
OLIGOCHAETA			14
MOLLUSCA			
	Physidae		
		Physella sp.	1
EPHEMEROPTERA			
	Caenidae		
		Caenis sp.	2
ODONATA			
	Libellulidae		
		Perithemis sp.	6
HEMIPTERA			
	Belostomatidae		
		Belostoma sp.	3
	Corixidae		
		immature corixid	347
COLEOPTERA			
	Haliplidae		
		Peltodytes sp.	2
	Hydrophilidae		
		Berosus sp.	21
		Helochares sp.	1
	Scirtidae		
		Prionocyphon sp.	1
DIPTERA			
	Chironomidae		572
		SUM	**970**

Appendix LXV. Stream usage assessment for GRBOO-001.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: OLD PANTHER CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 499866 Segment No.: __ __Station ID: WKU0331 (GRBOO-001)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: PANTHER CREEK

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110005

County 1: DAVIESS County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: PANTHER

Latitude: 37.6835 Longitude: -87.1791 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 08-30-01 (mm-dd-yy) End: 08-30-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT				X	
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 7550_____
Cause Code: 1600__ Source Code(s): 7550_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LXVI. Taxa list for GRBOO-009 (Deer Creek) based on low- gradient, multihabitat sampling.

Taxon		
OLIGOCHAETA		4
CRUSTACEA		
	Atyidae	
		Palaemonetes sp. 16
MOLLUSCA		
	Corbiculiidae	
		Corbicula fluminea 6
	Lymnaeidae	
		Pseudosuccinea columella 11
	Physidae	
		Physella sp. 12
	Sphaeriidae	
		Sphaerium sp. 6
EPHEMEROPTERA		
	Baetidae	
		Callibaetis sp. 3
	Caenidae	
		Caenis sp. 80
	Heptageniidae	
		Stenonema sp. 3
ODONATA		
	Aeshnidae	
		Basiaeschna sp. 5
	Coenagrionidae	
		Argia sp. 1
		Enallagma sp. 73
	Libellulidae	
		Epicordulia sp. 2
		Libellula sp. 4
HEMIPTERA		
	Gerridae	
		Gerris sp. 1
		Rheumatobates sp. 1
NEUROPTERA		
	Sialidae	
		Sialis sp. 1
COLEOPTERA		
	Elmidae	
		Dubiraphia sp. 1
		Stenelmis sp. 1

Appendix LXVI. Cont.

Taxon		
Haliplidae		
	Peltodytes sp.	3
Hydrophilidae		
	Berosus sp.	13
	Tropisternus sp.	5
Scirtidae		
	immature scirtid	2
		SUM 254

Appendix LXVII. Stream usage assessment for GRBOO-009.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: DEER CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 490771 Segment No.: __ __Station ID: WKU0334 (GRBOO-009)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: GREEN RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110005

County 1: WEBSTER County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: SEBREE

Latitude: 37.5464 Longitude: -87.5770 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-30-01 (mm-dd-yy) End: 07-30-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT				X	
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 1050, 7600, 7700_____
Cause Code: 1600__ Source Code(s): 1050, 7600, 7700_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LXVIII. Taxa list for GRBOO-016 (Little Muddy Creek) based on low-gradient, multihabitat sampling.

Taxon		
CRUSTACEA		
	Asellidae	
		Caecidotea sp. 1
		Lirceus sp. 2
	Atyidae	
		Palaemonetes sp. 6
	Talitridae	
		Hyalella azteca 36
MOLLUSCA		
	Ancylidae	
		Laevapex sp. 1
	Physidae	
		Physella sp. 2
	Sphaeriidae	
		Sphaerium sp. 3
EPHEMEROPTERA		
	Baetidae	
		Callibaetis sp. 3
	Caenidae	
		Caenis sp. 45
	Heptageniidae	
		Stenonema sp. 1
ODONATA		
	Aeshnidae	
		Boyeria sp. 1
		Nasiaeschna sp. 1
	Coenagrionidae	
		Ischnura sp. 3
	Libellulidae	
		Neurocordulia sp. 16
HEMIPTERA		
	Nepidae	
		Nepa sp. 2
NEUROPTERA		
	Sialidae	
		Sialis sp. 6
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 2

Appendix LXVIII. Cont.

Taxon			
COLEOPTERA			
	Elmidae		
		Dubiraphia sp.	1
	Haliplidae		
		Peltodytes sp.	1
	Hydrochidae		
		Hydrochus sp.	1
	Hydrophilidae		
		Berosus sp.	2
DIPTERA			
	Chironomidae		138
	Tabanidae		
		Chlorotabanus sp.	2
	Tipulidae		
		Tipula sp.	1
		SUM	**277**

Appendix LXIX. Stream usage assessment for GRBOO-016.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: LITTLE MUDDY CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 513506 Segment No.: __ __Station ID: WKU0335 (GRBOO-016)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: BARREN RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110002

County 1: BUTLER County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: MORGANTOWN

Latitude: 37.1593 Longitude: -86.6610 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-26-01 (mm-dd-yy) End: 07-26-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT				X	
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 1050_____
Cause Code: 1600__ Source Code(s): 7550_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LXX. Taxa list for GRBOO-035 (Deer Creek) based on low-gradient, multihabitat sampling.

Taxon		
OLIGOCHAETA		24
CRUSTACEA		
	Atyidae	
		Palaemonetes sp. 2
MOLLUSCA		
	Ancylidae	
		Laevapex sp. 1
	Physidae	
		Physella sp. 2
	Sphaeriidae	
		Sphaerium sp. 1
EPHEMEROPTERA		
	Baetidae	
		Callibaetis sp. 1
	Caenidae	
		Caenis sp. 20
ODONATA		
	Aeshnidae	
		Nasiaeschna sp. 2
	Coenagrionidae	
		Enallagma sp. 2
	Libellulidae	
		Somatochlora sp. 4
HEMIPTERA		
	Corixidae	
		immature corixid 11
	Gerridae	
		Rheumatobates sp. 1
		Trepobates sp. 22
NEUROPTERA		
	Sialidae	
		Sialis sp. 2
COLEOPTERA		
	Haliplidae	
		Peltodytes sp. 1
	Hydrophilidae	
		Berosus sp. 2

Appendix LXX. Cont.

Taxon			
DIPTERA			
	Ceratopogonidae		
		Atrichopogon sp.	1
		Bezzia/Palpomyia sp.	1
	Chironomidae		80
		SUM	**180**

Appendix LXXI. Stream usage assessment for GRBOO-035.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: DEER CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 490770 Segment No.: __ __Station ID: WKU0801 (GRBOO-035)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving S tream: OHIO RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05140203

County 1: LIVINGSTON County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: ROSICLARE

Latitude: 37.3976 Longitude: -88.3184 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-12-01 (mm-dd-yy) End: 07-12-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL	X				
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LXXII. Taxa list for GRBOO-057 (Tyson Branch) based on low-gradient, multihabitat sampling.

Taxon		
OLIGOCHAETA		1
CRUSTACEA		
	Atyidae	
		Palaemonetes sp. 13
	Cambaridae	
		immature cambarid 1
	Talitridae	
		Hyalella azteca 3
MOLLUSCA		
	Physidae	
		Physella sp. 2
EPHEMEROPTERA		
	Baetidae	
		Paracloeodes sp. 1
	Caenidae	
		Caenis sp. 6
	Heptageniidae	
		Stenacron sp. 4
ODONATA		
	Coenagrionidae	
		Argia sp. 3
		Enallagma sp. 1
HEMIPTERA		
	Corixidae	
		immature corixid 54
NEUROPTERA		
	Sialidae	
		Sialis sp. 1
TRICHOPTERA		
	Leptoceridae	
		Oecetis sp. 1
	Polycentropodidae	
		Cyrnellus fraternus 2
LEPIDOPTERA		
	Pyralidae	
		Acentria sp. 1
COLEOPTERA		
	Elmidae	
		Dubiraphia sp. 1

Appendix LXXII. Cont.

Taxon			
	Gyrinidae		
		Dineutus sp.	1
	Hydrophilidae		
		Berosus sp.	1
	Scirtidae		
		Prionocyphon sp.	1
DIPTERA			
	Ceratopogonidae		
		Bezzia/Palpomyia sp.	1
		Sphaeromias sp.	1
	Chaoboridae		
		Chaoborus sp.	1
	Chironomidae		173
		SUM	**274**

Appendix LXXIII. Stream usage assessment for GRBOO-057.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: TYSON BRANCH (Stream must be on 1:100k map)

GNIS Feature ID: 505754 Segment No.: __ __Station ID: WKU1001 (GRBOO-057)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: TRADEWATER RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05140205

County 1: CALDWELL County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: DALTON

Latitude: 37.3321 Longitude: -87.8410 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-11-01 (mm-dd-yy) End: 07-11-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT				X	
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM					

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 7550_____
Cause Code: 1600__ Source Code(s): 7550_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LXXIV. Taxa list for GRBOO-061 (Piney Creek) based on low-gradient, multihabitat sampling.

Taxon		
OLIGOCHAETA		16
CRUSTACEA		
	Asellidae	
		Caecidotea sp. 1
		Lirceus sp. 8
	Cambaridae	
		Orconectes sp. 1
MOLLUSCA		
	Hydrobiidae	
		immature hydrobiid 3
	Physidae	
		Physella sp. 4
	Planorbidae	
		Helisoma sp. 2
	Sphaeriidae	
		Pisidium sp. 18
		Sphaerium sp. 11
EPHEMEROPTERA		
	Ephemeridae	
		Hexagenia sp. 2
ODONATA		
	Aeshnidae	
		Nasiaeschna sp. 3
	Libellulidae	
		Libellula sp. 3
		immature libellulid 2
HEMIPTERA		
	Belostomatidae	
		Belostoma sp. 3
	Corixidae	
		Sigara sp. 54
	Notonectidae	
		Notonecta sp. 1
NEUROPTERA		
	Sialidae	
		Sialis sp. 25
COLEOPTERA		
	Dytiscidae	
		Laccophilus sp. 1
		Lioporeus sp. 3

Appendix LXXIV. Cont.

Taxon			
	Gyrinidae		
		Dineutus sp.	1
		Gyrinus sp.	1
	Haliplidae		
		Peltodytes sp.	3
	Hydrophilidae		
		Tropisternus sp.	2
	Scirtidae		
		Prionocyphon sp.	6
DIPTERA			
	Chironomidae		156
	Tipulidae		
		Erioptera sp.	1
		SUM	**331**

Appendix LXXV. Stream usage assessment for GRBOO-061.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: PINEY CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 500729 Segment No.: __ __Station ID: WKU1002 (GRBOO-061)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: TRADEWATER RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05140205

County 1: CRITTENDEN County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: SHADY GROVE

Latitude: 37.3044 Longitude: -87.9689 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-24-01 (mm-dd-yy) End: 07-24-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT				X	
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 7600, 7700_____
Cause Code: 1600__ Source Code(s): 7600, 7700_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LXXVI. Taxa list for GRBOO-069 (Highland Creek) based on low-gradient, multihabitat sampling.

Taxon		
OLIGOCHAETA		3
HIRUDINEA		2
CRUSTACEA		
	Atyidae	
		Palaemonetes sp. 40
	Cambaridae	
		immature cambarid 1
	Talitridae	
		Hyalella azteca 3
MOLLUSCA		
	Physidae	
		Physella sp. 4
EPHEMEROPTERA		
	Baetidae	
		Callibaetis sp. 1
	Caenidae	
		Caenis sp. 45
ODONATA		
	Aeshnidae	
		Nasiaeschna sp. 1
	Coenagrionidae	
		Argia sp. 21
		Enallagma sp. 1
	Gomphidae	
		Gomphus sp. 1
		Stylurus sp. 3
	Libellulidae	
		Epicordulia sp. 18
		Perithemis sp. 9
		immature libellulid 1
HEMIPTERA		
	Corixidae	
		immature corixid 200
	Gerridae	
		Trepobates sp. 2
	Nepidae	
		Ranatra sp. 1
NEUROPTERA		
	Sialidae	
		Sialis sp. 2

Appendix LXXVI. Cont.

Taxon			
TRICHOPTERA			
	Hydropsychidae		
		Cheumatopsyche sp.	2
	Hydroptilidae		
		Hydroptila sp.	1
	Leptoceridae		
		Oecetis sp.	9
COLEOPTERA			
	Elmidae		
		Dubiraphia sp.	3
		Stenelmis sp.	48
	Hydrophilidae		
		Berosus sp.	18
	Scirtidae		
		Prionocyphon sp.	
DIPTERA			
	Chironomidae		558
		SUM	**998**

Appendix LXXVII. Stream usage assessment for GRBOO-069.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: HIGHLAND CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 494210 Segment No.: __ __Station ID: WKU0803 (GRBOO-069)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: OHIO RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110005

County 1: UNION County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: UNIONTOWN

Latitude: 37.7813 Longitude: -87.8933 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-12-01 (mm-dd-yy) End: 07-12-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 7600, 7700_____
Cause Code: 1600__ Source Code(s): 7600, 7700_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LXXVIII. Taxa list for GRBOO-073 (Narge Creek) based on low- gradient, multihabitat sampling.

Taxon			
OLIGOCHAETA			2
CRUSTACEA			
	Asellidae		
		Lirceus sp.	1
MOLLUSCA			
	Physidae		
		Physella sp.	36
	Sphaeriidae		
		Sphaerium sp.	37
	Unionidae		
		immature unionid	2
EPHEMEROPTERA			
	Baetidae		
		immature baetid	3
	Caenidae		
		Caenis sp.	73
ODONATA			
	Coenagrionidae		
		Argia sp.	35
HEMIPTERA			
	Belostomatidae		
		Belostoma sp.	8
	Corixidae		
		immature corixid	3
	Gerridae		
		Trepobates sp.	1
COLEOPTERA			
	Dytiscidae		
		Colymbetes sp.	1
	Haliplidae		
		Peltodytes sp.	8
	Hydrophilidae		
		Berosus sp.	30
		Tropisternus sp.	7
DIPTERA			
	Chironomidae		32
		SUM	**279**

Appendix LXXIX. Stream usage assessment for GRBOO-073.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: NARGE CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 499173 Segment No.: __ __Station ID: WKU0344 (GRBOO-073)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: POND RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110006

County 1: HOPKINS County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: HANSON

Latitude: 37.4440 Longitude: -87.3878 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-10-01 (mm-dd-yy) End: 07-10-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT				X	
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 1050, 7600, 7700_____
Cause Code: 1600__ Source Code(s): 1050, 7600, 7700_____
Cause Code: 1500__ Source Code(s): 7100_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LXXX. Taxa list for GRBOO-076 (Gilles Ditch) based on low-gradient, multihabitat sampling.

Taxon		
OLIGOCHAETA		17
HIRUDINEA		2
CRUSTACEA		
	Cambaridae	
		immature cambarid 1
MOLLUSCA		
	Physidae	
		Physella sp. 144
	Planorbidae	
		Helisoma sp. 4
	Sphaeriidae	
		Pisidium sp. 42
		Sphaerium sp. 42
EPHEMEROPTERA		
	Caenidae	
		Caenis sp. 1
ODONATA		
	Aeshnidae	
		Anax sp. 2
	Coenagrionidae	
		Enallagma sp. 40
HEMIPTERA		
	Corixidae	
		immature corixid 2
	Veliidae	
		Mesovelia sp. 2
LEPIDOPTERA		
	Pyralidae	
		Acentria 1
		Munroessa/Synclita sp. 13
COLEOPTERA		
	Dytiscidae	
		Laccophilus sp. 1
	Haliplidae	
		Peltodytes sp. 10
	Hydrophilidae	
		Berosus sp. 22
		Helocombus sp. 1
		Tropisternus sp. 10

Appendix LXXX. Cont.

Taxon			
DIPTERA			
	Ceratopogonidae		
		Ceratopogon sp.	2
	Chironomidae		77
	Stratiomyiidae		
		Stratiomys sp.	1
	Tabanidae		
		Chrysops sp.	1
		SUM	**438**

Appendix LXXXI. Stream usage assessment for GRBOO-076.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: GILLES DITCH (Stream must be on 1:100k map)

GNIS Feature ID: KY0057 Segment No.: __ __Station ID: WKU0345 (GRBOO-076)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: RHODES CREEK

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110005

County 1: DAVIESS County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: OWENSBORO WEST

Latitude: 37.7681 Longitude: -87.1886 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-10-01 (mm-dd-yy) End: 07-10-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT				X	
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 7600, 7700_____
Cause Code: 1600__ Source Code(s): 7600, 7700_____
Cause Code: 1500__ Source Code(s): 7100_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LXXXII. Taxa list for GRBOO-100 (Deer Creek) based on low-gradient, multihabitat sampling.

Taxon		
CRUSTACEA		
	Atyidae	
		Palaemonetes sp. 20
	Cambaridae	
		immature cambarid 1
MOLLUSCA		
	Corbiculiidae	
		Corbicula fluminea 9
	Lymnaeidae	
		Fossaria sp. 7
	Physidae	
		Physella sp. 41
	Planorbidae	
		Helisoma sp. 4
	Sphaeriidae	
		Sphaerium sp. 13
EPHEMEROPTERA		
	Baetidae	
		Callibaetis sp. 2
	Caenidae	
		Caenis sp. 32
ODONATA		
	Aeshnidae	
		Basiaeschna sp. 6
		Nasiaeschna sp. 2
	Coenagrionidae	
		Enallagma sp. 77
	Libellulidae	
		Erythemis sp. 1
		Neurocordulia sp. 5
		immature libellulid 2
HEMIPTERA		
	Nepidae	
		Ranatra sp. 1
	Pleidae	
		Paraplea sp. 1
	Veliidae	
		Steinovelia sp. 1

Appendix LXXXI. Cont.

Taxon			
TRICHOPTERA			
	Leptoceridae		
		Oecetis sp.	1
COLEOPTERA			
	Elmidae		
		Dubiraphia sp.	1
	Haliplidae		
		Peltodytes sp.	9
	Hydrophilidae		
		Berosus sp.	8
		Tropisternus sp.	1
DIPTERA			
	Ceratopogonidae		
		Bezzia/Palpomyia sp.	2
		Probezzia sp.	1
	Culicidae		
		Anopheles sp.	2
	Tipulidae		
		Erioptera sp.	1
		SUM	**251**

Appendix LXXXIII. Stream usage assessment for GRBOO-100.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: DEER CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 490771 Segment No.: __ __Station ID: WKU0350 (GRBOO-100)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: GREEN RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110005

County 1: WEBSTER County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: SEBREE

Latitude: 37.5582 Longitude: -87.5451 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-30-01 (mm-dd-yy) End: 07-30-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT				X	
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 1050, 7600, 7700_____
Cause Code: 1600__ Source Code(s): 1050, 7600, 7700_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LXXXIV. Taxa list for GRBOO-104 (North Branch South Fork Panther Creek) based on low-gradient, multihabitat sampling.

Taxon		
CRUSTACEA		
	Asellidae	
		Caecidotea sp. 5
	Cambaridae	
		immature cambarid 2
MOLLUSCA		
	Lymnaeidae	
		Stagnicola sp. 1
	Physidae	
		Physella sp. 12
	Planorbidae	
		Helisoma sp. 16
	Sphaeriidae	
		Pisidium sp. 2
		Sphaerium sp. 9
EPHEMEROPTERA		
	Baetidae	
		Procloeon sp. 3
	Caenidae	
		Caenis sp. 23
	Heptageniidae	
		Stenonema sp. 16
ODONATA		
	Aeshnidae	
		Basiaeschna sp. 5
		Boyeria sp. 2
	Libellulidae	
		Macromia sp. 4
NEUROPTERA		
	Sialidae	
		Sialis sp. 7
TRICHOPTERA		
	Polycentropodidae	
		Nyctiophylax sp. 3
COLEOPTERA		
	Elmidae	
		Dubiraphia sp. 2
		Stenelmis sp. 1
	Haliplidae	
		Peltodytes sp. 1

Appendix LXXXIV. Cont.

Taxon			
	Scirtidae		
		Prionocyphon sp.	3
DIPTERA			
	Chironomidae		161
	Tabanidae		
		Chrysops sp.	1
	Tipulidae		
		Ormosia sp.	1
		SUM	**280**

Appendix LXXXV. Stream usage assessment for GRBOO-104.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: NORTH BRANCH SOUTH FORK PANTHER CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 499538 Segment No.: __ __Station ID: WKU0353 (GRBOO-104)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: SOUTH FORK PANTHER CREEK

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110005

County 1: HANCOCK County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: FORDSVILLE

Latitude: 37.7299 Longitude: -86.7300 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-17-01 (mm-dd-yy) End: 07-17-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 1050_____
Cause Code: 1600__ Source Code(s): 7550_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LXXXVI. Taxa list for GRBOO-105 (Wolf Lick Creek) based on low-gradient, multihabitat sampling.

Taxon		
HIRUDINEA		1
CRUSTACEA		
	Asellidae	
		Lirceus sp. 4
	Atyidae	
		Palaemonetes sp. 4
	Talitridae	
		Hyalella azteca 10
MOLLUSCA		
	Ancylidae	
		Ferrissia sp. 1
EPHEMEROPTERA		
	Baetidae	
		Procloeon sp. 2
	Caenidae	
		Caenis sp. 11
ODONATA		
	Coenagrionidae	
		Enallagma sp. 7
	Libellulidae	
		Macromia sp. 2
		Neurocordulia sp. 3
HEMIPTERA		
	Corixidae	
		immature corixid 13
	Gerridae	
		Trepobates sp. 2
NEUROPTERA		
	Sialidae	
		Sialis sp. 1
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 1
	Hydroptilidae	
		Hydroptila sp. 2
	Leptoceridae	
		Oecetis sp. 1
	Polycentropodidae	
		Polycentropus sp. 1

Appendix LXXXVI. Cont.

Taxon			
COLEOPTERA			
	Elmidae		
		Dubiraphia sp.	4
		Stenelmis sp.	2
	Gyrinidae		
		Gyretes sp.	1
	Haliplidae		
		Peltodytes sp.	5
	Hydrophilidae		
		Berosus sp.	2
DIPTERA			
	Chironomidae		207
		SUM	**287**

Appendix LXXXVII. Stream usage assessment for GRBOO-105.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: WOLF LICK CREEK (Stream must be on 1:100k map)

GNIS Feature ID: 507017 Segment No.: __ __Station ID: WKU0354 (GRBOO-105)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: MUD RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110003

County 1: LOGAN County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: DUNMOR

Latitude: 37.0097 Longitude: -86.9644 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-20-01 (mm-dd-yy) End: 07-20-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 7550_____
Cause Code: 1600__ Source Code(s): 7550_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)
Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix LXXXVIII. Taxa list for GRBOO111 (West Fork Pond River) based on low-gradient, multihabitat sampling.

Taxon		
OLIGOCHAETA		16
MOLLUSCA		
	Ancylidae	
		Ferrissia sp. 3
	Physidae	
		Physella sp. 1
	Planorbidae	
		Helisoma sp. 1
	Sphaeriidae	
		Pisidium sp. 1
		Sphaerium sp. 4
EPHEMEROPTERA		
	Baetidae	
		Callibaetis sp. 1
	Caenidae	
		Caenis sp. 3
ODONATA		
	Libellulidae	
		Neurocordulia sp. 19
HEMIPTERA		
	Corixidae	
		immature corixid 1
	Gerridae	
		Trepobates sp. 1
	Nepidae	
		Ranatra sp. 1
NEUROPTERA		
	Sialidae	
		Sialis sp. 18
TRICHOPTERA		
	Hydropsychidae	
		Cheumatopsyche sp. 1
COLEOPTERA		
	Elmidae	
		Dubiraphia sp. 3
	Haliplidae	
		Peltodytes sp. 2
	Scirtidae	
		Prionocyphon sp. 1

Appendix LXXXVII. Cont.

Taxon			
DIPTERA			
	Ceratopogonidae		
		Bezzia/Palpomyia sp.	2
		Culicoides sp.	15
		Dasyhelea sp.	4
	Chaoboridae		
		Chaoborus sp.	2
	Chironomidae		105
	Tabanidae		
		Chlorotabanus sp.	1
		SUM	**206**

Appendix LXXXIX. Stream usage assessment for GRBOO-111.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: WEST FORK POND RIVER (Stream must be on 1:100k map)

GNIS Feature ID: 506444 Segment No.: __ __Station ID: WKU0357 (GRBOO-111)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: POND RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05110006

County 1: CHRISTIAN County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: CROFTON

Latitude: 37.0543 Longitude: -87.4097 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-27-01 (mm-dd-yy) End: 07-27-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT			X		
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 1350_____
Cause Code: 1600__ Source Code(s): 7550_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix XC. Taxa list for GRBOO-112 (Goose Pond Ditch) based on low-gradient, multihabitat sampling.

Taxon			
OLIGOCHAETA			2
HIRUDINEA			1
MOLLUSCA			
	Corbiculiidae		
		Corbicula fluminea	5
EPHEMEROPTERA			
	Caenidae		
		Caenis sp.	1
COLEOPTERA			
	Hydrophilidae		
		Berosus sp.	1
DIPTERA			
	Chironomidae		26
		SUM	**36**

Appendix XCI. Stream usage assessment for GRBOO-112.

305b ASSESSMENT FORM
Sampling Year: 2001
Basin Management Unit: GREEN & TRADEWATER
(Complete a form for each assessed segment.)

Stream Name: GOOSE POND DITCH (Stream must be on 1:100k map)

GNIS Feature ID: KY0058 Segment No.: __ __Station ID: WKU0805 (GRBOO-112)

Total length of stream (in miles, excluding reservoirs): _____ . ___

Receiving Stream: OHIO RIVER

Downstream/Upstream Mile Point: _____.___ to _____.___ Segment Length: _____.___

Downstream/Upstream Description: _____to _____
Major Basin: Big Sandy; Little Sandy; Tygarts; Licking; Kentucky; Salt; Green; Tradewater; Tennessee; Mississippi; Upper Cumberland; Lower Cumberland; Ohio (circle one)

USGS (8-digit) Cataloging Unit: 05140203

County 1: UNION County 2: _____ (sample site county(s))

Sample Site Mile Point: _____.___ Topographic Map Name: SALINE MINES

Latitude: 37.6240 Longitude: -88.1305 (dd.dddd or dms)

Assessment Date: 04-17-03 (mm-dd-yy) Type: Monitored or Evaluated (circle one)

Sampling Dates: Start: 07-27-01 (mm-dd-yy) End: 07-27-01 (mm-dd-yy)

Biological Integrity: Excellent; Good; Fair; Poor (circle one) Number of Sites: 1

AQUATIC LIFE USE SUPPORT TABLE (Check all that apply)

AQUATIC LIFE	FULL	FULL, but THREATENED	PARTIAL	NONSUPPORT	Level of Info 1 to 4
HABITAT				X	
BIOLOGICAL				X	
TOXICITY					
PHYSICAL/CHEM	X				

USE SUPPORT
AQUATIC LIFE (circle one)
Full Threatened Partial Nonsupport

Cause Code: 1100__ Source Code(s): 1050, 7600, 7700_____
Cause Code: 1600__ Source Code(s): 1050, 7600, 7700_____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
Cause Code: _____ Source Code(s): _____
(One or more sources must be designated for each cause)

FISH CONSUMPTION (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

SWIMMING (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

DRINKING WATER (circle one)

Full Threatened Partial Nonsupport

Cause Code: _____ Source Code(s): _____

Cause Code: _____ Source Code(s): _____

OVERALL USE (DOW use only – do not circle)

Full Threatened Partial Nonsupport

Assessment Method Code(s): _____

Assessment Performed by: (circle all that apply)

DOW	DOW	University	Federal	State	Other
Amb WQ	NPS	EKU	COE	KDFWR	ORSANCO
Amb Bio	GDW	WKU	USFS	KSNPC	MSD
WMB	Probmon	MoreheadU	USFW	VA	LFUCG
Bact	DMR		TVA	WVA	
IS				TN	
RR					
FO					

Names of Contributors: Scott Grubbs

Comments:

Appendix XCII. Number of fecal coliform bacteria colonies (per 100 ml). Dry indicates lack of water at stream site at time of sampling. Values in parentheses represent duplicate counts. Refer to Table IV for site code information.

Site Code	June	July	August	September	October
GRBEX-01	4400	> 12000	> 12000	> 12000	392
GRBEX-02	345	1440	200 (192)	840 (920)	24
GRBEX-03	418	440	56	> 12000	120
GRBEX-04	345	216	272	> 12000	72
GRBEX-05	491	376	96	1720	40
GRBEX-06	255 (218)	9600	< 8	3440	128
GRBEX-07	455	560	48	880	16 (24)
GRBEX-08	291	168	72	304	< 8
GRBEX-09	1309 (1073)	56	2200 (2320)	168	424
GRBEX-10	119	840	> 12000	72 (144)	72
GRBEX-11	136	216	32	48	< 8
GRBEX-12	382	104	288	216	56
GRBEX-13	376	216	72	840	240
GRBEX-14	64	56	40 (48)	104	176
GRBEX-15	144	48	56	120	112
GRBEX-16	273	240 (320)	384	320	72
GRBEX-17	32	48	520	256	16
GRBEX-18	160	16 (8)	432	96	24
GRBEX-19	418	280 (440)	280	48	48
GRBEX-20	168	104	512 (520)	> 12000 (> 12000)	288
GRBEX-21	384	56	> 12000	> 12000	240
GRBEX-22	40 (< 8)	< 8	112	< 8	336
GRBEX-23	1680	48	96	320	1720
GRBEX-24	184	32	8	288	128
GRBEX-25	240 (96)	5200	88	112	10000
GRBEX-26	56	< 8	16	32	304
GRBEX-27	152	> 12000	528	144	12200 (12800)
GRBEX-28	64	64	104	40	96
GRBEX-29	< 8	< 8	< 8	< 8	< 8
GRBEX-30	8	16	16	8	< 8
FC-G51	509	40	1160	2720	136
FC-G59	3600	16	1600	2720	336
FC-G60	636	88	880	2820	600
FC-T02	880	8000 (6800)	920	224	48
FC-T12	88	128	2520	920	< 8
FC-T25	840	12000	Dry	560	136
FC-T34	96	16	400	6600	64 (48)
FC-T35	2280	< 8	184	760	8
FC-T36	320	104	10400	> 12000	176
FC-T37	2280	168	1120	2120	80 (64)
FC-T41	> 12000	32	520	> 12000	88 (88)
FC-T47	> 12000	560	1240	1360	48
FC-T48	5800 (4000)	224	920	960	32
FC-sta.no.44	152	144	64	8	16
FC-sta.no.45	8400	40	328	288	< 8
FC-sta.no.46	218	80	64	152	56
FC-sta.no.47	236	88	96	96	400
FC-sta.no.48	400	88	600	152	80
FC-sta.no.49	182	88	48	5000	8
FC-sta.no.50	176	8 (8)	128	> 12000	< 8