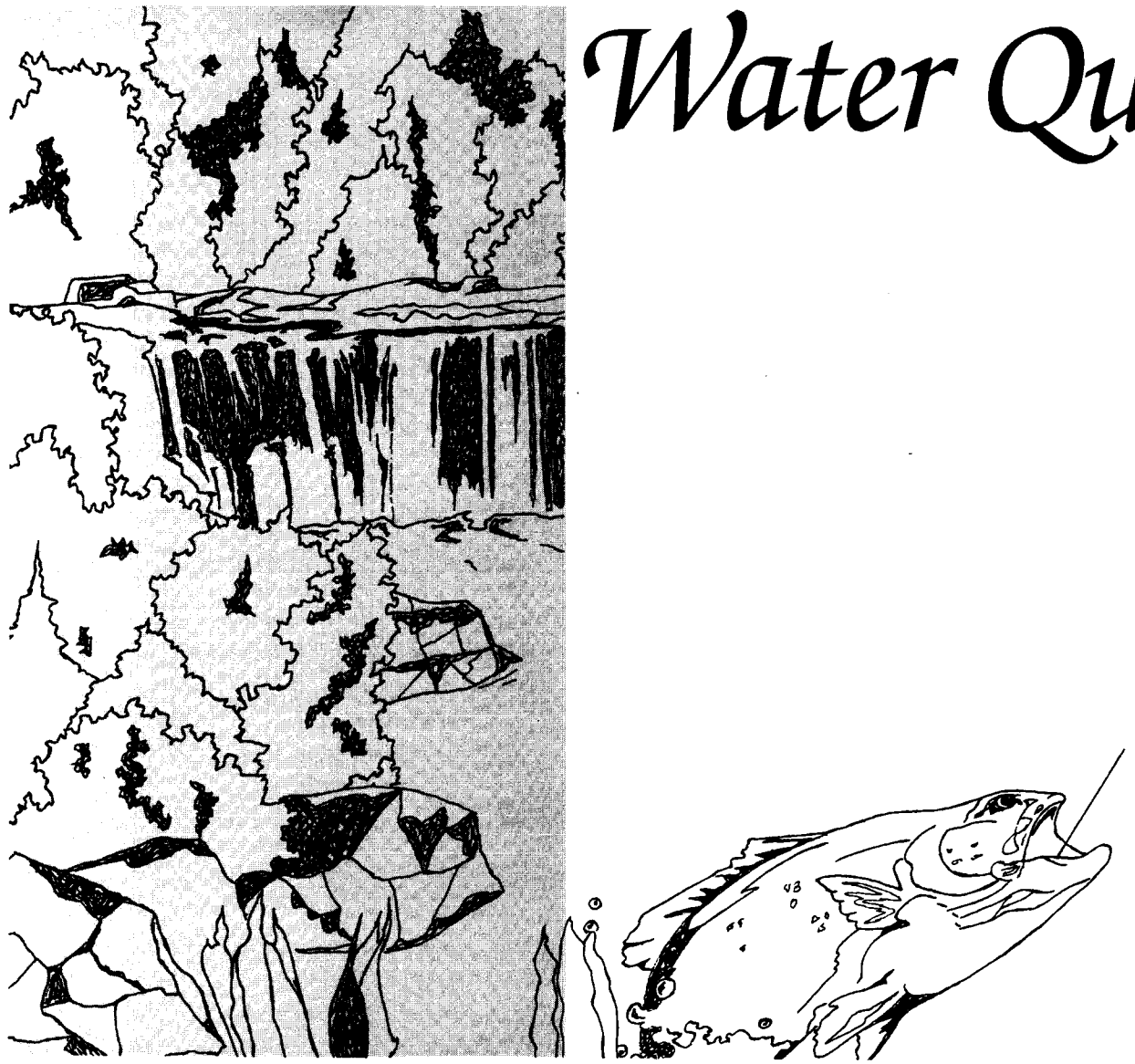
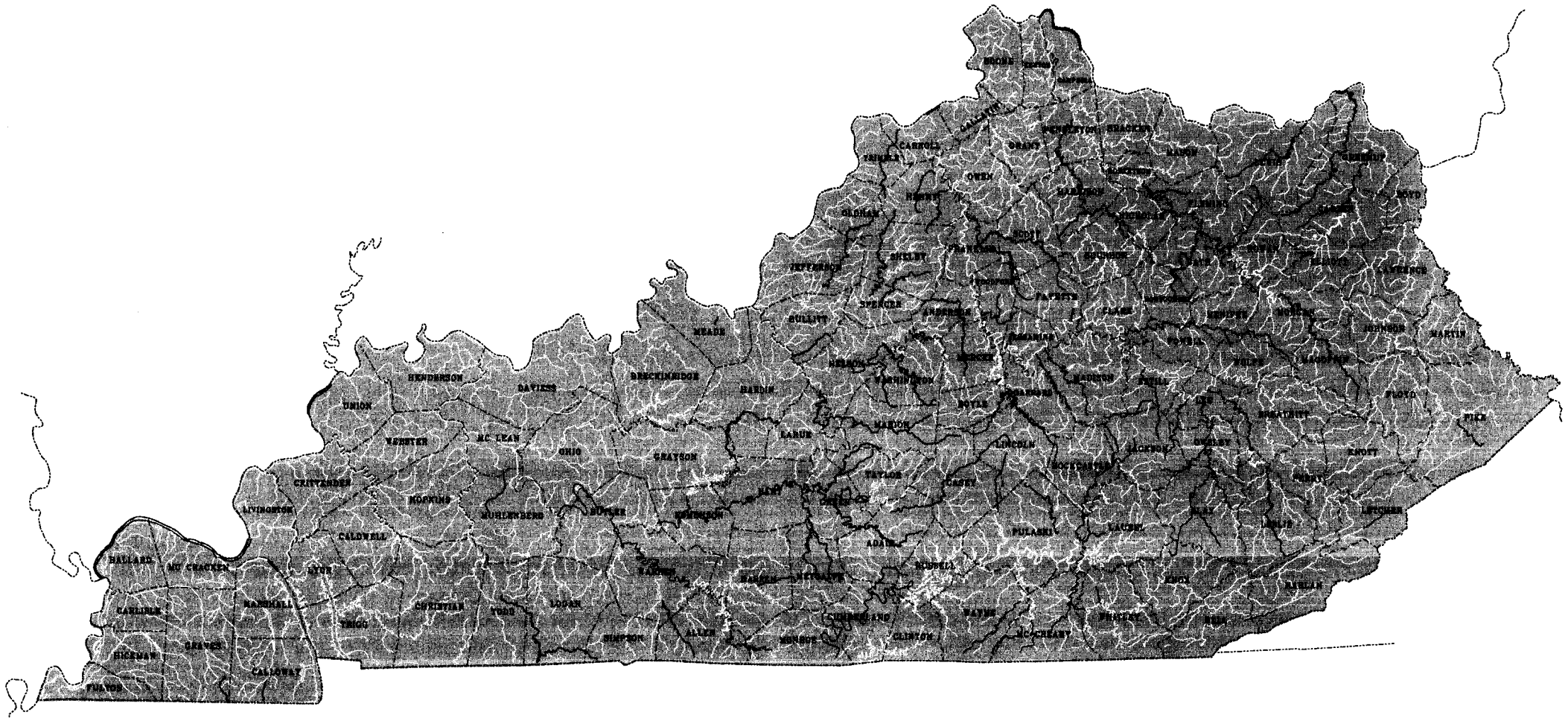
Water Quality



Water quality is a relative measure of a stream's physical, chemical, and biological integrity. The more pristine and life-supporting a stream is, the higher its water quality. Rivers with the most pristine water quality are in relatively undeveloped portions of the state. Some of these waters have been designated as Outstanding Resource Waters, while others are under consideration for designation. Those rivers that were designated were done so because their water quality approximates natural conditions. Such rivers serve as standards by which the water quality in other streams can be measured.

Water Quality Study Rivers



EVALUATION METHODOLOGY

A number of rivers and streams were evaluated for the existence of high-quality waters. Each study segment included within the water quality resource category met one of the following **minimum standards:**

- waters designated as Outstanding Resource Waters under 401 KAR 5:026
- waters recommended for designation as Outstanding Resource Waters by the Kentucky State Nature Preserves Commission
- waters recommended for designation as Outstanding Resource Waters by a qualified agency other than the Kentucky State Nature Preserves Commission

River and stream segments meeting the minimum standards were evaluated on the basis of designation or recommendation as Outstanding Resource Waters, water quality parameters meeting Outstanding Resource Waters criteria, ability to support unique or diverse aquatic life, and pollutant discharges. A complete listing of designated Outstanding Resource Waters is contained in Appendix B. Each study segment was assigned a numeric score. The scores were then totaled, and each river or stream assigned a value class based on distribution of overall score.

Study segments were assigned scores based on the following factors:

Outstanding Resource Water Designation or Recommendation

River designated as Outstanding Resource Water or recommended for automatic designation with substantial supporting data	30 points
River recommended as Outstanding Resource Water with limited supporting data	20 points
River recommended as Outstanding Resource Water with no supporting data available	10 points
Unknown	0 points

Water Quality Standards

Available data indicates river meets all Water Quality Standards (401 KAR 5:031)	30 points
River meets most Water Quality Standards; criteria occasionally exceeded	20 points
River frequently exceeds criteria	10 points
Unknown	0 points

Unique or Diverse Aquatic Species

River supports federally listed threatened or endangered species, more than one state-listed threatened or endangered species, or an usually high diversity of aquatic species	30 points
River supports a high diversity of aquatic species	20 points
River supports an average diversity of aquatic species	10 points
Unknown	0 points

Pollutant Discharges

No point source discharges or known nonpoint sources of pollution	30 points
Minor point source discharges or known nonpoint sources of pollution other than urbanization	20 points
Major point source discharges or known nonpoint source runoff impairments	10 points
Unknown	0 points

An overall score was computed for each of the rivers evaluated and divided into three subcategories represented by value class rankings. Each study river was ranked according to the following:

Class 1 .....100 - 120 points

Class 2 .....71 - 99 points

Class 3 .....15 - 70 points

FINDINGS

The evaluation and ranking process was limited by the availability of water quality data. There was a lack of coverage in some areas, as well as limited historical data where monitoring stations have been in place for a relatively short period of time.

A total of 122 segments (9.0% of the rivers studied in the assessment) covering 3,139.2 miles (8.1% of the total miles studied) were evaluated in the Water Quality Category. Segments ranged in length from 1.2 miles (Ruin Creek) to 89.1 miles (Tygarts Creek). The highest water quality streams were Bad Branch, Bunches Creek, Youngs Creek, Rock Creek, and Dog Slaughter Creek. The most threatened high-quality stream in the state is the Little South Fork of the Cumberland.

Twenty-eight rivers covering a total of 439.8 miles were identified as Class 1 water quality rivers. Class 1 ranged in length from 1.7 to 50.4 miles, averaging 15.7 miles. The majority of Class 1 rivers are located in eastern Kentucky.

Fifty rivers covering 1,241.8 miles were identified as Class 2 rivers. Class 2 rivers ranged in length from 1.2 to 89.1 miles, averaging 24.8 miles. The majority are located in eastern and central Kentucky.

Forty-four rivers covering 1,457.6 miles were identified as Class 3 rivers. Class 3 rivers ranged in length from 1.7 to 87 miles, averaging 33.1 miles. The majority are located in central and eastern Kentucky.

Table 25. Summary of Water Quality Evaluations

	Class 1	Class 2	Class 3	Total
Number of Segments	28	50	44	122
Miles	439.8	1241.8	1457.6	3139.2

SOURCES OF INFORMATION

Kentucky Department for Environmental Protection, *Kentucky Water Quality Administrative Regulations*, Division of Water, 1986 and 1988.

Kentucky Department for Environmental Protection, *Kentucky Report to Congress on Water Quality*, Division of Water, 1988.

Kentucky Department for Environmental Protection, Intensive Survey Reports, Division of Water.

Kentucky Department for Environmental Protection, Ambient Water Monitoring Data, Division of Water.

Kentucky State Nature Preserves Commission, *Recommendations for Kentucky Outstanding Resource Water Classification with Water Quality Criteria for Protection*, 1982.

U.S. Department of Interior, *Water Yearbook*, Geological Survey, 1980.

Martins Fork

James Archambeault

WATER QUALITY -- CLASS 1 RIVERS

River Name	Downstream Endpoint	River Mile	Upstream Endpoint	River Mile	Downstream County	Upstream County	Study Length
Archers Creek	Cumberland River	0.0	Headwaters	3.2	Whitley	Whitley	3.2
Bad Branch	Poor Fork Cumberland River	0.0	Headwaters	4.1	Letcher	Letcher	4.1
Beaver Creek	Lake Cumberland	2.2	Headwaters	9.2	McCreary	McCreary	7.0
Buck Creek	Lake Cumberland	10.5	Long Branch near Clarence	47.7	Pulaski	Pulaski	37.2
Buckhorn Creek	Clemons Fork	4.4	Coles Fork	6.8	Breathitt	Knott	2.4
Bunches Creek	Cumberland River	0.0	Headwaters	4.9	Whitley	Whitley	4.9
Clemons Fork	Buckhorn Creek	0.0	Headwaters	4.7	Breathitt	Breathitt	4.7
Coles Fork	Buckhorn Creek	0.0	Headwaters	6.4	Breathitt	Knott	6.4
Dog Slaughter Creek	Cumberland River	0.0	Headwaters	5.4	Whitley	Whitley	5.4
Eagle Creek	Cumberland River	0.0	Headwaters	6.2	McCreary	McCreary	6.2
Green River	Lock & Dam No. 4	148.0	Lock & Dam No. 5	168.1	Butler	Butler	20.1
Green River	West Bdry Mammoth Cave NP	182.7	Munfordville, Ky.	225.9	Edmonson	Hart	43.2
Horse Lick Creek	Rockcastle River	0.0	Clover Bottom Creek	12.2	Jackson	Jackson	12.2
Kennedy Creek	Little South Fork Cumberland River	0.0	Headwaters	3.1	Wayne	Wayne	3.1
Kinniconick Creek	Ohio River	0.0	Headwaters	50.4	Lewis	Lewis	50.4
Laurel Creek	Marsh Creek	0.0	Headwaters	9.2	McCreary	McCreary	9.2
Little South Fork Cumberland R	Lake Cumberland	4.1	Tennessee State Line	43.7	McCreary	Wayne	39.6
Martins Fork	Rough Branch	27.4	Headwaters (Cumberland Gap Park)	37.2	Harlan	Harlan	9.8
Middle Fork Rockcastle River	Rockcastle River	0.0	Indian Creek	7.8	Jackson	Jackson	7.8
Ned Branch	Rockcastle River	0.0	Headwaters	1.9	Laurel	Laurel	1.9
North Fork Triplett Creek	Triplett Creek	0.0	Headwaters	25.6	Rowan	Rowan	25.6
Poor Fork Cumberland River	Presley House Branch	737.6	Headwaters	744.0	Letcher	Letcher	6.4
Rock Creek	White Oak Creek	3.9	Tennessee State Line	21.9	McCreary	McCreary	18.0
Rockcastle River	Lake Cumberland	8.5	Middle Fork Rockcastle River	53.3	Laurel	Jackson	44.8
Tight Hollow Creek	Mill Creek	0.0	Headwaters	1.7	Wolfe	Wolfe	1.7
War Fork Station Camp Creek	Station Camp Creek	0.0	Headwaters	13.7	Jackson	Jackson	13.7
Whippoorwill Creek	Red River	0.0	Headwaters	44.7	Logan	Todd	44.7
Youngs Creek	Cumberland River	0.0	Headwaters	6.1	Whitley	Whitley	6.1

WATER QUALITY -- CLASS 2 RIVERS

River Name	Downstream Endpoint	River Mile	Upstream Endpoint	River Mile	Downstream County	Upstream County	Study Length
Barren River	Green River	0.0	Bays Fork	62.0	Butler	Warren	62.0
Barren River	Barren River Lake	118.5	Headwaters	158.7	Allen	Monroe	40.2
Big Pitman Creek	Green River	0.0	Headwaters	42.2	Green	Taylor	42.2
Big Sinking Creek	Little Sandy River	0.0	Headwaters	19.0	Carter	Elliott	19.0
Big South Fork Cumberland R.	Ky 92	40.3	Tennessee State Line	55.2	McCreary	McCreary	14.9
Boone Creek	Kentucky River	0.0	Ky 418	6.5	Clark	Clark	6.5
Brashears Creek	Salt River	0.0	Headwaters	25.5	Spencer	Shelby	25.5
Cane Creek	Rockcastle River	0.0	Headwaters	12.0	Laurel	Laurel	12.0
Clear Creek	Kentucky River	0.0	Headwaters	19.3	Woodford	Woodford	19.3
Cumberland River	Lake Cumberland	558.5	Jellico Creek	574.8	McCreary	Whitley	16.3
East Fork Clear Creek	Clear Creek	0.0	Headwaters	10.0	Woodford	Jessamine	10.0
Elkhorn Creek	Kentucky River	0.0	Forks of Elkhorn	17.8	Franklin	Franklin	17.8
Falling Timber Creek	Skaggs Creek	0.0	Headwaters	14.7	Barren	Metcalfe	14.7
Greasy Creek	Middle Fork Kentucky River	0.0	Headwaters	26.6	Leslie	Harlan	26.6
Green River	Munfordville, KY	225.9	Green River Lake Dam	305.6	Hart	Taylor	79.7
Green River	Green River Lake	339.9	Headwaters	383.5	Adair	Lincoln	43.6
Jessamine Creek	Kentucky River	0.0	Ky 1268	5.5	Jessamine	Jessamine	5.5
Licking River	Blue Lick Springs	97.8	Cave Run Lake Dam	173.6	Nicholas	Bath	75.8
Little Sandy River	Argillite, Ky.	13.0	Grayson Lake Dam	51.0	Carter	Carter	38.0
Marsh Creek	Cumberland River	0.0	Laurel Creek	8.6	McCreary	McCreary	8.6
Middle Fork Kentucky River	North Fork Kentucky River	0.0	Buckhorn Lake Dam	43.3	Lee	Perry	43.3
Middle Pitman Creek	Big Pitman Creek	0.0	Headwaters	13.9	Green	Taylor	13.9
Nolin River	Green River	0.0	Nolin Lake Dam	8.1	Edmonson	Edmonson	8.1
North Fork Elkhorn Creek	Forks of Elkhorn	0.0	Headwaters	74.4	Franklin	Fayette	74.4
North Fork Ruin Creek	Ruin Creek	0.0	Headwaters	5.1	Elliott	Elliott	5.1
North Rolling Fork	Rolling Fork	107.9	Boyle/Marion County Line	119.9	Marion	Marion	12.0
Ohio River	Mississippi River	0.0	Smithland, Ky.	62.9	Ballard	Livingston	62.9
Ohio River	Below Cincinnati Island	119.4	Raleigh Bar	126.4	Union	Union	7.0
Ohio River	Ghent	442.3	Gallatin/Carroll County line	446.3	Carroll	Carroll	4.0
Ohio River	Kenton/Boone County Line	503.9	New Richmond Station	532.0	Kenton	Campbell	28.1

River Name	Downstream Endpoint	River Mile	Upstream Endpoint	River Mile	Downstream County	Upstream County	Study Length
Ohio River	South Portsmouth, Ky.	626.3	Tygarts Creek	628.2	Greenup	Greenup	1.9
Paint Lick Creek	Kentucky River	0.0	Headwaters	30.8	Garrard	Garrard	30.8
Red River	Swift Camp Creek	59.5	Ky 746	68.6	Wolfe	Wolfe	9.1
Rock Creek	Rockcastle River	0.0	Headwaters	2.0	Laurel	Laurel	2.0
Ruin Creek	Little Sandy River	0.0	North & South Forks	1.2	Elliott	Elliott	1.2
Russell Fork	Levisa Fork	0.0	Virginia State Line	16.0	Pike	Pike	16.0
Sexton Creek	South Fork Kentucky River	0.0	Headwaters	22.5	Owsley	Jackson	22.5
Slate Creek	Licking River	0.0	Headwaters	59.3	Bath	Menifee	59.3
South Fork Ruin Creek	Ruin Creek	0.0	Headwaters	4.0	Elliott	Elliott	4.0
South Fork Station Camp Creek	Station Camp Creek	0.0	Headwaters	26.2	Jackson	Jackson	26.2
Station Camp Creek	Kentucky River	0.0	War Fork	22.3	Estill	Jackson	22.3
Sturgeon Creek	Kentucky River	0.0	Headwaters	33.4	Lee	Jackson	33.4
Swift Camp Creek	Red River	0.0	Mountain Parkway	10.8	Wolfe	Wolfe	10.8
Tennessee River	Cooper Creek	17.9	Kentucky Lake Dam	22.4	Marshall	Marshall	4.5
Terrapin Creek	Tennessee State Line	2.8	Ky 97	8.1	Graves	Graves	5.3
Townsend Creek	South Fork Licking River	0.0	Headwaters	15.5	Bourbon	Bourbon	15.5
Trammel Fork	Drakes Creek	0.0	Tennessee State Line	30.2	Warren	Allen	30.2
Troublesome Creek	Big South Fork Cumberland River	0.0	Headwaters	3.7	McCreary	McCreary	3.7
Tygarts Creek	Ohio River	0.0	Headwaters	89.1	Greenup	Carter	89.1
Wilson Creek	Rolling Fork	0.0	Headwaters	17.0	Bullitt	Bullitt	17.0

WATER QUALITY -- CLASS 3 RIVERS

River Name	Downstream Endpoint	River Mile	Upstream Endpoint	River Mile	Downstream County	Upstream County	Study Length
Beech Creek***	Salt River	0.0	Headwaters	30.0	Spencer	Shelby	30.0
Beech Fork	Rowan Creek	20.9	Headwaters	107.9	Nelson	Marion	87.0
Benson Creek	Keenebec School	2.3	South Benson Creek	4.6	Franklin	Franklin	2.3
Big South Fork Rolling Fork*	Rolling Fork	0.0	Headwaters	21.8	Marion	Casey	21.8
Bullskin Creek	Brashears Creek	0.0	Headwaters	22.5	Shelby	Henry	22.5
Cartwright Creek**	Beech Fork	0.0	Headwaters	26.0	Washington	Marion	26.0

River Name	Downstream Endpoint	River Mile	Upstream Endpoint	River Mile	Downstream County	Upstream County	Study Length
Chaplin River**	Beaver Creek	22.7	Thompson Branch	40.1	Washington	Washington	17.4
Collins Fork	Goose Creek	0.0	Headwaters	17.8	Clay	Knox	17.8
Crocus Creek**	Cumberland River	0.0	Headwaters	27.5	Cumberland	Russell	27.5
Cumberland River	Tennessee State Line	385.5	Wolf Creek Dam	460.9	Monroe	Russell	75.4
Cypress Creek	Muhlenberg/McLean County Line	18.0	Headwaters	33.3	McLean	Muhlenberg	15.3
Dix River	Herrington Lake (Ky 52)	34.6	Headwaters	80.0	Boyle	Rockcastle	45.4
Doe Run	Ky 1638	5.2	Headwaters	8.0	Meade	Meade	2.8
Drennon Creek*	Kentucky River	0.0	Headwaters	21.7	Henry	Henry	21.7
East Fork Clarks River***	Clarks River	0.0	Tennessee State Line	7.4	Calloway	Calloway	7.4
East Fork Little Barren River	Little Barren River	0.0	Headwaters	29.5	Metcalfe	Metcalfe	29.5
Fishing Creek*	Lake Cumberland	20.5	Headwaters	41.6	Pulaski	Lincoln	21.1
Fleming Creek	Licking River	0.0	Ky 11	20.1	Nicholas	Fleming	20.1
Floyds Fork	Bullitt County Line	13.1	North Fork	61.7	Bullitt	Oldham	48.6
Goose Creek	South Fork Kentucky River	0.0	Headwaters	42.6	Clay	Clay	42.6
Green River	Lock & Dam No. 3	108.5	Lock & Dam No. 4	148.0	Muhlenberg	Butler	39.5
Hanging Fork	Dix River	0.0	Headwaters	32.3	Boyle	Casey	32.3
Hinkston Creek	South Fork Licking River	0.0	Somerset Creek	34.8	Bourbon	Montgomery	34.8
Indian Creek*	Middle Fork Rockcastle River	0.0	Hurley, Ky.	4.4	Jackson	Jackson	4.4
Licking River	Cave Run Lake	232.8	Headwaters	294.1	Morgan	Magoffin	61.3
Little Barren River	Green River	0.0	Greasy Creek	16.0	Green	Green	16.0
Little Barren River	Greasy Creek	16.0	East and South Forks	20.9	Green	Metcalfe	4.9
Little Kentucky River	Ohio River	0.0	Lake Jerrico Dam	27.2	Carroll	Henry	27.2
Middle Fork Kentucky River	Buckhorn Lake	76.6	Greasy Creek	84.1	Leslie	Leslie	7.5
Nolin River	Nolin Lake	64.3	North Fork	121.5	Grayson	Larue	57.2
Red Bird River	South Fork Kentucky River	0.0	Sugar Creek	21.1	Clay	Clay	21.1
Red River	Kentucky River	0.0	Swift Camp Creek	59.5	Clark	Wolfe	59.5
Red River	Ky 746	68.6	Headwaters	94.2	Clark	Wolfe	25.6
Red River	Tennessee State Line	50.2	Tennessee State Line	80.5	Simpson	Logan	30.3
Rolling Fork	New Haven	38.4	Big South Fork	107.9	Larue	Marion	69.5
Rough River	Rocky Fork	67.6	Long Spring Branch	69.3	Ohio	Ohio	1.7
Russell Creek	Green River	0.0	Headwaters	68.1	Green	Russell	68.1
Salt River	Taylorsville Lake	82.0	Boyle County Line	138.0	Spencer	Mercer	56.0

River Name	Downstream Endpoint	River Mile	Upstream Endpoint	River Mile	Downstream County	Upstream County	Study Length
Silver Creek	Kentucky River	0.0	Headwaters	36.2	Madison	Madison	36.2
Six Mile Creek	Kentucky River	0.0	Headwaters	23.6	Shelby	Henry	23.6
South Fork Elkhorn Creek	Forks of Elkhorn	0.0	Headwaters	52.7	Franklin	Fayette	52.7
South Fork Kentucky River	Kentucky River	0.0	Red Bird River	45.1	Lee	Clay	45.1
South Fork Licking River	Licking River	0.0	Stoner Creek	65.1	Pendleton	Bourbon	65.1
South Fork Little Barren River	Little Barren River	0.0	Headwaters	35.8	Metcalfe	Metcalfe	35.8

Evaluation of several study rivers was completed with insufficient data; * indicates data for one of four criteria was unavailable, ** indicates data for two of four criteria were unavailable, and * indicates data for three of four criteria were unavailable.**