

This report was prepared by the Kentucky Water Research Institute as a product of the statewide Kentucky Watershed Management process. Information presented in this report was collected from many sources. Reasonable attempts were made to ensure that information and figures are as accurate as possible, but no representation or guarantee is made as to either the correctness or suitability of information for particular purposes. All critical information should be independently verified. Please address questions or corrections to Basin Coordinator, KWRI, Rm. 233 Mining and Minerals Resources Building, University of Kentucky, Lexington, Kentucky 40506-0107.

**Summary of Basin Characteristics and Facilities**

**General Land-use Characteristics:**

Total Land Area (Acres):	68,542	Acres	% of Total		
Residential Area:	4,099		6.0	Number of Mine Permits:	0
Commercial Area:	989		1.4	Total Permitted Mining Area (Acres):	0
Industrial Area:	139		0.2	Number of Identified Wetland Areas:	1
Agricultural Area:	39,369		57.4	Total Wetland Area (Acres):	0
Rural and Wooded Area:	23,937		34.9		
Other Land-use Area:	17		0.0		

**Withdrawal and Discharge Sites:**

Number of Public Water Supplies and Water Withdrawal Sites:	1	Number of KPDES Discharge Permits:	24
Surface Water Withdrawals:	1		
Groundwater Withdrawals:	0		
No. of Potable Water Treatment Facilities:	0		

**Sampling Site Statistics:**

Number of USGS Gaging Stations:	0
Number of Kentucky Division of Water Sampling Sites:	2
Number of Kentucky Dept. of Fish and Wildlife Sampling Sites:	7
Number of US Forest Service Sampling Sites:	0
Number of US Army Corps of Engineers Sampling Sites:	0
Number of Kentucky River Watershed Watch Sampling Sites:	3
Number of Lexington-Fayette Urban Co. Gov. Sampling Sites:	0

**Watershed Indicators and Ranking Categories:**

Overall Watershed Ranking:

Protection Ranking

Observed Impacts

Potential Impacts

Restoration Ranking

Medium

Low

Medium

High

Medium

**Protection Categories:**

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Wetland Areas	0	Acres	0 - 106	12
Surface Drinking Water Sources	1	No. of sources	0 - 14	2
Ground Drinking Water Sources	0	No. of sources	0 - 17	1
Groundwater Sensitivity	2.83	Score	2 - 5	3.21
KY Dept. of Fish and Wildlife Management Areas	0	Acres	0 - 2951	93
U.S. Forest Service Management Areas	0	Acres	0 - 155253	12,600
Kentucky State Park Areas	0	Acres	0 - 1928	42
Nature Preserves Commission Areas	0	Acres	0 - 1430	32
Nature Conservancy Areas	0	Acres	0 - 2473	28
Reference Reach Watersheds	0.00	Score	0 - 100	3.08
Outstanding Resource Watersheds	0.00	Score	0 - 0	0.00
Recognized Stream Resources	0	No. of resources	0 - 8	1
Kentucky Rivers Assessment Scores	0.34	Score	0 - 11	1.80

**Observed Impact Categories:**

*Human Health Impact Categories:*

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Flood Declarations	3	Number since 1970	0 - 10	4
Water Supply Inadequacy	0.00	Score	0 - 2	0.22
Observed Impacts to Surface Drinking Water	1.00	Score	1 - 1	1.00
Observed Impacts to Fish Consumption	1.00	Score	1 - 1	1.00
Observed Impacts to Primary Water Contact	1.00	Score	1 - 3	1.33
Contamination Sites Impacting Human Health	12	Number of sites	0 - 71	4

*Ecological Health Impact Categories:*

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Observed Impacts to Aquatic Life	2.10	Score	1 - 3	1.31
Contamination Sites Impacting Ecological Health	12	Number of sites	0 - 71	4

**Potential Impact Categories:**

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Potential Contamination Sites	23	Number of sites	1 - 121	12
Potential Pesticide Loading	25	Est. sales in tons	0 - 45	10
Potential Fertilizer Loading	1,220	Est. tons applied	0 - 2747	394
Agricultural Erosion Potential	3.40	Est. tons erosion / acre	0 - 9	3.20
Livestock Operations Potential Impact	15,415	Animal units	55 - 43826	7,021
KPDES Discharge Violations	380	Number of violations	0 - 541	39
KY Division of Water Citizen Complaints	37	Number of complaints	0 - 53	9
Toxic Release Inventory	21,876	Score	0 - 11547626	231,638
Population Change Projection	344	Number of persons	-149 - 11030	448
Population Not on Public Sewer Systems	1,926	Number of persons	12 - 4511	1,114
Mining Area	0	Acres	0 - 6305	355
Surface Water Runoff Potential	75.44	SCS Curve Number	60 - 79	68
KPDES Permitted Discharges	24	Number of sites	0 - 56	6

### Stream and Waterbody Use Support Summary

<b>Total Stream Miles:</b> <input type="text" value="97.1"/>	<i>Number of Segments</i>	<i>Stream Miles Assessed</i>	<i>Miles * Fully Supportina</i>	<i>Miles * Partially Supportina</i>	<i>Miles * Not Supportina</i>	<i>Miles * Threatened</i>
<b>Segments Assessed:</b>	9	30.2	4.6	9.6	6.7	9.3
<b>Designated Uses</b>						
<b>Aquatic Life:</b>	9	30.2	4.6	9.6	6.7	9.3
<b>Primary Contact:</b>						
<b>Fish Consumption:</b>						
<b>Drinking Water:</b>						

\* Blank values indicate no assessed segments for this category.

<b>Assessed Stream Segments and Waterbodies</b>					
<i>Stream or Waterbody Name *</i>	<i>Starting Milepoint</i>	<i>Ending Milepoint</i>	<i>Segment Length (miles)</i>	<i>Designated Uses *</i>	<i>Overall Level of Support</i>
Benson Creek	21.6	25.5	3.9	AL	Threatened
Benson Creek	6.7	13.4	6.7	AL	Not Supporting
Benson Creek	4.6	6.7	2.1	AL	Partially Supporting
Benson Creek	0	4.6	4.6	AL	Fully Supporting
Goose Creek	1.9	4.2	2.3	AL	Partially Supporting
Goose Creek	0	1.8	1.8	AL	Partially Supporting
North Benson Creek	0.8	2	1.2	AL	Partially Supporting
North Fork North Benson Creek	0	2.2	2.2	AL	Partially Supporting
South Benson Creek	0	5.4	5.4	AL	Threatened

\*Abbreviations: AL - Aquatic Life Support, PC - Primary Contact Recreation, SC - Secondary Contact Recreation, FC - Fish Consumption, DW - Drinking Water Supply, UT - Unnamed Tributary

<b>Causes for Nonsupport or Impairment of Designated Uses</b>					
<i>Stream or Waterbody Name *</i>	<i>Starting Milepoint</i>	<i>Ending Milepoint</i>	<i>Segment Length (miles)</i>	<i>Impaired or Threatened Designated Use</i>	<i>Level of Support</i>
Benson Creek	4.6	6.7	2.1	Aquatic Life Support	Partially Supporting
<i>Possible Causes of Impairment:</i>			<i>Possible Sources For Impairment:</i>		
Nutrients			Highway/Road/Bridge Runoff, Land Disposal, Onsite Wastewater Systems (Septic Tanks), Urban Runoff/Storm Sewers		
Benson Creek	6.7	13.4	6.7	Aquatic Life Support	Not Supporting
<i>Possible Causes of Impairment:</i>			<i>Possible Sources For Impairment:</i>		
Siltation, Other habitat alterations			Agriculture, Habitat Modification (other than Hydromodification), Highway/Road/Bridge Runoff, Urban Runoff/Storm Sewers		
Goose Creek	0	1.8	1.8	Aquatic Life Support	Partially Supporting

Watershed Name: Benson Creek

11-Digit Watershed Identity Number: 05100205260

<p><i>Possible Causes of Impairment:</i> Cause Unknown, Other habitat alterations, Siltation</p>		<p><i>Possible Sources For Impairment:</i> Agriculture, Habitat Modification (other than Hydromodification), Highway/Road/Bridge Runoff, Urban Runoff/Storm Sewers</p>			
Goose Creek	1.9	4.2	2.3	Aquatic Life Support	Partially Supporting
<p><i>Possible Causes of Impairment:</i> Other habitat alterations</p>		<p><i>Possible Sources For Impairment:</i> Agriculture, Grazing related Sources, Pasture grazing - Riparian and/or Upland</p>			
North Benson Creek	0.8	2	1.2	Aquatic Life Support	Partially Supporting
<p><i>Possible Causes of Impairment:</i> Siltation, Organic enrichment/Low DO, Other habitat alterations</p>		<p><i>Possible Sources For Impairment:</i> Agriculture, Construction, Highway/Road/Bridge Runoff, Urban Runoff/Storm Sewers</p>			
North Fork North Benson Creek	0	2.2	2.2	Aquatic Life Support	Partially Supporting
<p><i>Possible Causes of Impairment:</i> Organic enrichment/Low DO, Other habitat alterations, Siltation</p>		<p><i>Possible Sources For Impairment:</i> Agriculture, Construction, Habitat Modification (other than Hydromodification), Land Development, Removal of Riparian Vegetation</p>			
<p>*Abbreviations: UT - Unnamed Tributary</p>					

Watershed Name: Benson Creek

11-Digit Watershed Identity Number: 05100205260

**Withdrawal Sites and Discharge Facilities:**

<i>Public Water Supplies and Water Withdrawal</i>			
<i>Facility</i>	<i>Origin of Source</i>	<i>Type of Facility</i>	<i>Permit ID Number</i>
B.F.I. WASTE SYSTEMS/BENSON VALLEY	Surface Water	Water Withdrawal Site	WW1378

<i>KPDES Permitted Discharge Facilities</i>			<i>KPDES Site ID Number</i>
<i>Facility</i>	<i>Type of Facility</i>		
BFI WASTE SYSTEMS OF N AMERICA	REFUSE SYSTEMS	KY0087581	
BRIDGEPORT ELEM SCHOOL	ELEMENTARY & SECONDARY SCHOOLS	KY0075001	
COOLBROOK SUBD	LAND SUBDIVIDERS & DEV, EX CEM	KY0044351	
EDGEWOOD SUBD	LAND SUBDIVIDERS & DEV, EX CEM	KY0074977	
EVERGREEN MHP #1	OPER OF RES MOBILE HOME SITES	KY0086312	
EVERGREEN SEWAGE DISPOSAL SYST	OPERATORS OF APART BUILDINGS	KY0078298	
FARMDALE SUBD	LAND SUBDIVIDERS & DEV, EX CEM	KY0054780	
FARMGATE SUBD	LAND SUBDIVIDERS & DEV, EX CEM	KY0074969	
FLYING J TRUCK PLAZA	GASOLINE SERVICE STATIONS	KY0101486	
FOX RUN SUBD DOWNSTREAM INC	LAND SUBDIVIDERS & DEV, EX CEM	KY0086967	
H & M MHP	OPER OF RES MOBILE HOME SITES	KY0080632	
HAWKEEGAN CENTER	OPER OF NONRESIDENTIAL BLDGS	KY0088111	
HUNTINGTON WOODS	LAND SUBDIVIDERS & DEV, EX CEM	KY0088650	
KY F & W RES OFFICE BLDG	OPER OF NONRESIDENTIAL BLDGS	KY0081710	
MEADOWBROOK SUBD	LAND SUBDIVIDERS & DEV, EX CEM	KY0074951	
SHADY ACRES MHP	OPER OF RES MOBILE HOME SITES	KY0078263	
STEWART HOME SCHOOL	INTERMEDIATE CARE FACILITIES	KY0078191	
SUBURBAN MHP	OPER OF RES MOBILE HOME SITES	KY0074454	
WADDY TRAVEL CENTERS LLC	GASOLINE SERVICE STATIONS	KY0086657	
WAINSCOTT CHEVRON	GASOLINE SERVICE STATIONS	KY0073431	
WILLOWCREST SUBD	LAND SUBDIVIDERS & DEV, EX CEM	KY0042552	

**Gaging Stations and Sampling Sites:**

<i>US Geological Survey and US Army Corps of Engineers Stream Gaging Stations</i>			
<i>Stream Location</i>	<i>Agency</i>	<i>Station ID Number</i>	<i>Sampling Parameter</i>
South Benson Creek	USGS	USGS03287534	Flow

<i>KY Division of Water Sampling Sites</i>	
<i>Stream Name</i>	<i>Type of Sampling</i>
Goose Creek	Physical/Chemical Monitoring
Benson Creek	Physical/Chemical Monitoring

<i>KY Dept of Fish and Wildlife Sampling / Assessment Sites</i>					
<i>Stream Segment</i>	<i>Upstream Description</i>	<i>Downstream Description</i>	<i>Total Length of Segment</i>	<i>Upstream Mile Point</i>	<i>Downstream Mile Point</i>
Goose Creek	I-64	Mouth	4.2	1.8	0
Benson Creek	Goose Creek	North Benson Creek	28.8	13.4	6.7
Benson Creek	North Benson Creek	South Fork Benson Creek	28.8	6.7	4.6

Watershed Name: Benson Creek

11-Digit Watershed Identity Number: 05100205260

Benson Creek	South Fork Benson Creek	Mouth	28.8	4.6	0
North Benson Creek	White Oak Creek	North Fork North Benson Creek	6.1	2	0.8
North Fork North Benson Creek	Quire Brance & Sudduth Branch	Mouth	2.2	2.2	0
South Benson Creek	US 60	Upstream of Benson Creek	18.3	5.8	1.2

<i>KY River Watershed Watch Sampling Sites</i>		
<i>Stream Name</i>	<i>KRWW Sample ID No.</i>	<i>Site Description</i>
Benson Creek	K51	At Red Bridge Falls
Benson Creek	K50	Downstream of Red Bridge
South Fork Benson Creek	K52	At Riffle Above Red Bridge

Watershed Name:

Benson Creek

11-Digit Watershed Identity Number:

05100205260

### Results from 1999 KY River Watershed Watch Sampling:

#### Conventional Parameters:

Sample ID Number: K50 Stream: Benson Creek

##### Physical Data (May):

pH	0	Alkalinity	156
Temperature	0	Total Hardness	192
Dissolved Oxygen	2	Chlorides	26.8
		Conductivity	457
		Total Organic Carbon	13.6
		Total Suspended Solids	16

##### Fecal Data (July / August):

	Coliform Count	Strep Count	Coliform/Strep Ratio
July			
August			

Sample ID Number: K51 Stream: Benson Creek

##### Physical Data (May):

pH	0	Alkalinity	129
Temperature	0	Total Hardness	154
Dissolved Oxygen	2	Chlorides	9.2
		Conductivity	320
		Total Organic Carbon	7.4
		Total Suspended Solids	13

##### Fecal Data (July / August):

	Coliform Count	Strep Count	Coliform/Strep Ratio
July			
August			

Sample ID Number: K52 Stream: South Fork Benson Creek

##### Physical Data (May):

pH	0	Alkalinity	
Temperature	0	Total Hardness	
Dissolved Oxygen	0	Chlorides	
		Conductivity	
		Total Organic Carbon	
		Total Suspended Solids	

##### Fecal Data (July / August):

	Coliform Count	Strep Count	Coliform/Strep Ratio
July			
August			

Note: Most indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm). Temperature is in Celsius degrees. Alkalinity and hardness are as mg/L of calcium carbonate. Bacterial counts are in colonies per 100 milliliters. Conductivity units are micro-mhos per centimeter

#### Nutrient Parameters:

Sample ID Number: K50 Stream: Benson Creek

Ammonia		Orthophosphate as Phosphate	0.191	Sulfate	43.6
Ammonia Nitrogen		Orthophosphate as Phosphorus	0.062		
Total Kjeldahl Nitrogen as NH3	0.63	Total Recoverable Phosphorus	0.23		
Total Kjeldahl Nitrogen as N	0.52				
Nitrate					
Nitrate Nitrogen					

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Sample ID Number: K51 Stream: Benson Creek

Ammonia		Orthophosphate as Phosphate		Sulfate	27.7
Ammonia Nitrogen		Orthophosphate as Phosphorus			
Total Kjeldahl Nitrogen as NH3	0.44	Total Recoverable Phosphorus	0.17		
Total Kjeldahl Nitrogen as N	0.36				
Nitrate					
Nitrate Nitrogen					

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Watershed Name:

Benson Creek

11-Digit Watershed Identity Number:

05100205260

Sample ID Number: K52 Stream: South Fork Benson Creek

Ammonia	<input type="text"/>	Orthophosphate as Phosphate	<input type="text"/>	Sulfate	<input type="text"/>
Ammonia Nitrogen	<input type="text"/>	Orthophosphate as Phosphorus	<input type="text"/>		
Total Kjeldahl Nitrogen as NH3	<input type="text"/>	Total Recoverable Phosphorus	<input type="text"/>		
Total Kjeldahl Nitrogen as N	<input type="text"/>				
Nitrate	<input type="text"/>				
Nitrate Nitrogen	<input type="text"/>				

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

**Metals and Mineral Parameters:**

Sample ID Number: K50 Stream: Benson Creek

Aluminum	<input type="text" value="13.86"/>	Calcium	<input type="text" value="102.44"/>	Lead	<input type="text" value="0.01"/>	Selenium	<input type="text" value="0.02"/>	Thallium	<input type="text" value="0.23"/>
Antimony	<input type="text"/>	Chromium	<input type="text"/>	Lithium	<input type="text" value="0.02"/>	Silicon	<input type="text" value="21.91"/>	Vanadium	<input type="text"/>
Barium	<input type="text" value="0.22"/>	Cobalt	<input type="text" value="0.01"/>	Magnesium	<input type="text" value="20.86"/>	Sodium	<input type="text" value="19.78"/>	Zinc	<input type="text" value="0.03"/>
Beryllium	<input type="text"/>	Copper	<input type="text"/>	Manganese	<input type="text" value="4.68"/>	Strontium	<input type="text" value="0.29"/>		
Boron	<input type="text" value="0.16"/>	Iron	<input type="text" value="10.28"/>	Potassium	<input type="text" value="15.33"/>	Sulfur	<input type="text" value="11.83"/>		

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Sample ID Number: K51 Stream: Benson Creek

Aluminum	<input type="text" value="2.54"/>	Calcium	<input type="text" value="43.56"/>	Lead	<input type="text"/>	Selenium	<input type="text" value="0.01"/>	Thallium	<input type="text"/>
Antimony	<input type="text"/>	Chromium	<input type="text"/>	Lithium	<input type="text"/>	Silicon	<input type="text" value="3.59"/>	Vanadium	<input type="text"/>
Barium	<input type="text" value="0.06"/>	Cobalt	<input type="text" value="0.003"/>	Magnesium	<input type="text" value="10.95"/>	Sodium	<input type="text" value="6.77"/>	Zinc	<input type="text" value="0.006"/>
Beryllium	<input type="text"/>	Copper	<input type="text"/>	Manganese	<input type="text" value="0.10"/>	Strontium	<input type="text" value="0.17"/>		
Boron	<input type="text" value="0.16"/>	Iron	<input type="text" value="1.09"/>	Potassium	<input type="text" value="5.77"/>	Sulfur	<input type="text" value="8.77"/>		

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Sample ID Number: K52 Stream: South Fork Benson Creek

Aluminum	<input type="text"/>	Calcium	<input type="text"/>	Lead	<input type="text"/>	Selenium	<input type="text"/>	Thallium	<input type="text"/>
Antimony	<input type="text"/>	Chromium	<input type="text"/>	Lithium	<input type="text"/>	Silicon	<input type="text"/>	Vanadium	<input type="text"/>
Barium	<input type="text"/>	Cobalt	<input type="text"/>	Magnesium	<input type="text"/>	Sodium	<input type="text"/>	Zinc	<input type="text"/>
Beryllium	<input type="text"/>	Copper	<input type="text"/>	Manganese	<input type="text"/>	Strontium	<input type="text"/>		
Boron	<input type="text"/>	Iron	<input type="text"/>	Potassium	<input type="text"/>	Sulfur	<input type="text"/>		

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

**Pesticide/Herbicide Parameters:**

Sample ID No.	Stream	2,4-D	Chlorpyrifos	Triazines
K50	Benson Creek	<input type="text"/>	<input type="text"/>	<input type="text" value="0.14"/>
K51	Benson Creek	<input type="text"/>	<input type="text"/>	<input type="text" value="0.07"/>
K52	South Fork Benson Creek	<input type="text"/>	<input type="text"/>	<input type="text" value="0.23"/>

Note: All indicators are in micrograms per liter which is equivalent to parts per billion (ppb).