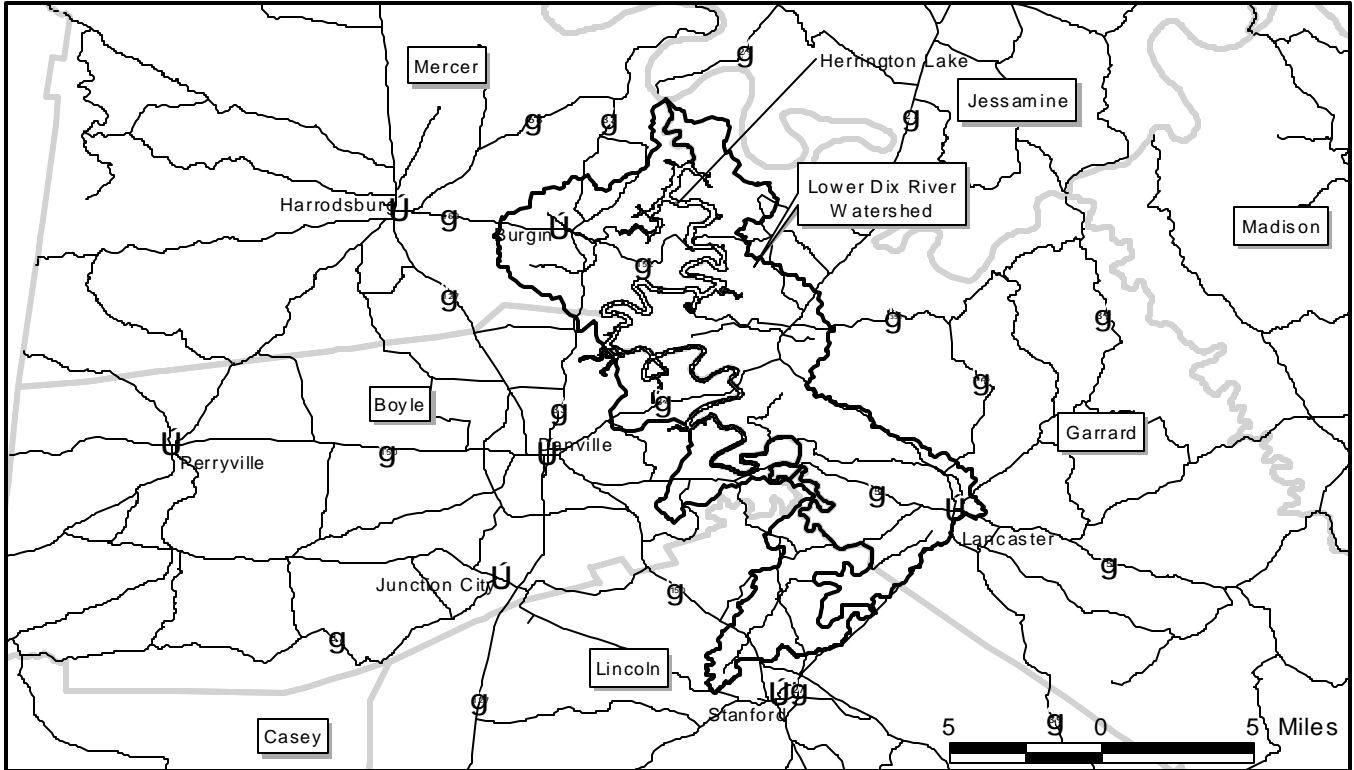


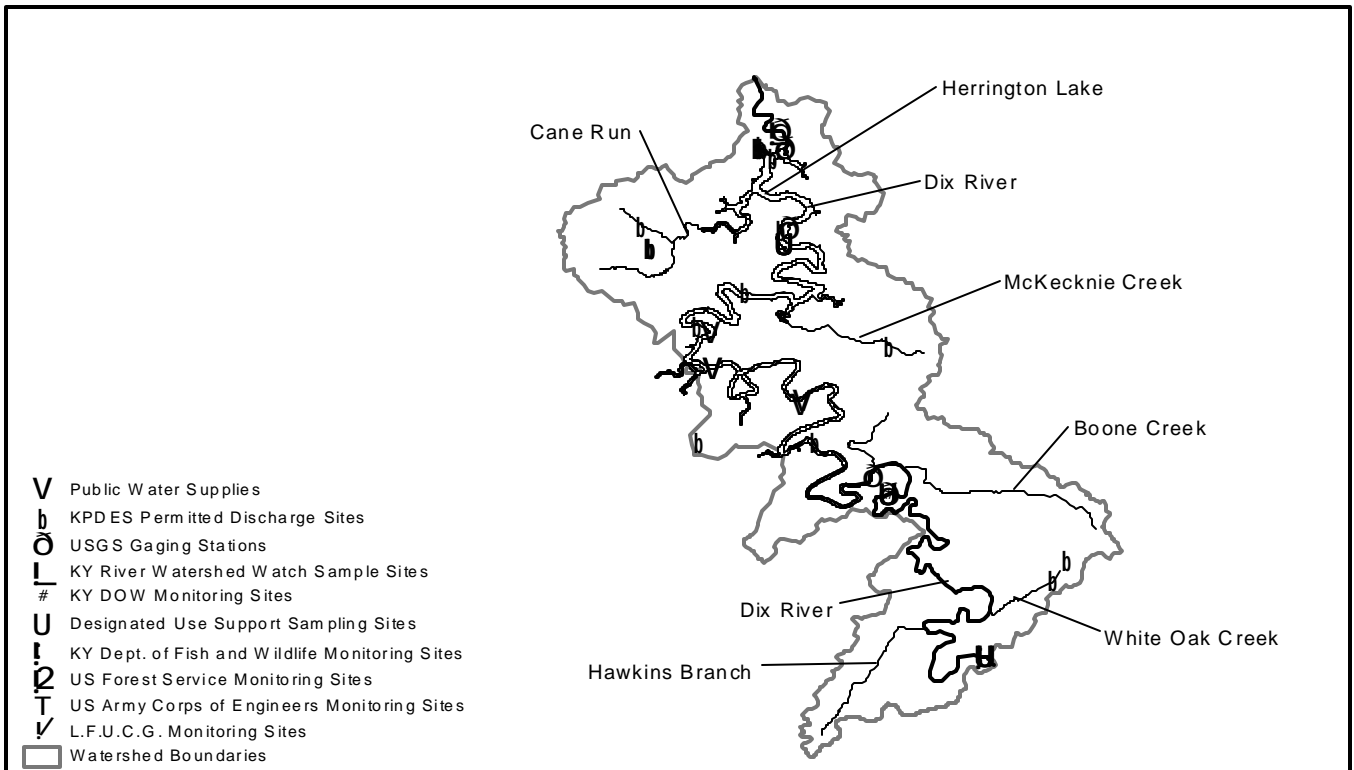
# Lower Dix River Watershed

## Watershed Number: 05100205170

### Location Map



### Watershed Features



**Geography.** The Dix River (lower) watershed includes the western edge of Garrard County, part of northern Lincoln County, and eastern portions of Boyle and Mercer Counties. The land is in the inner subregion of the Bluegrass physiographic region, characterized by undulating terrain and moderate rates of both surface runoff and groundwater drainage. Most of the watershed lies above thick layers of easily dissolved limestone that form carbonate aquifers. Groundwater flows through channels in the limestone, so caves and springs are common in regions with this geology. Some areas lie above interbedded limestones and shales (>20% limestone, allowing groundwater flow where the clay content is low enough).

**Waterways.** The lower Dix River watershed includes the river itself from the mouth of Gilberts Creek southwest of Lancaster to the confluence with the Kentucky River near High Bridge. Herrington Lake makes up much of this stretch of the Dix River. Among the creeks that feed the river within this watershed are Hawkins Branch, Boone Creek, White Oak Creek, McKecknie Creek, Tanyard Branch, Cane Run, and Rocky Fork. The watershed also receives water from the Dix River (upper), Logan Creek, Hanging Fork Creek, Clarks Run, and Spears Creek & Mocks Branch watersheds.

**Land and water use.** Land in the watershed is almost 90% agricultural and almost 5% residential. The surface waters of the watershed supply the drinking water for the municipal system in Danville. Eleven businesses and organizations hold permits for discharges into the creeks. See tables for details.

**Agency data assessment.** The assessed river segments in this watershed fully support their designated uses, based on biological and/or water-quality data. Herrington Lake does not support its designated uses, because of excess nutrient enrichment from a variety of sources. See tables for details.

**Watershed rankings.** The ranking formula provides a preliminary ranking by synthesizing a broad spectrum of watershed characteristics, current conditions, and threats. This watershed ranks in the group with the lowest need for protection and/or restoration. This rating is for the watershed on average: particular sites and particular waters within the watershed may vary widely. See tables for details.

**Volunteer data.** Phosphorus levels in the Dix River were elevated enough to cause potential nutrient enrichment problems (> 0.1 mg/L). See tables for details.

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):	58,659	Acres	% of Total		
Residential Area:	2,655		4.5	Number of Mine Permits:	0
Commercial Area:	135		0.2	Total Permitted Mining Area (Acres):	0
Industrial Area:	28		0.0	Number of Identified Wetland Areas:	75
Agricultural Area:	51,892		88.5	Total Wetland Area (Acres):	50
Rural and Wooded Area:	1,338		2.3		
Other Land-use Area:	2,592		4.4		

### Withdrawal and Discharge Sites:

Number of Public Water Supplies and Water Withdrawal Sites:	5	Number of KPDES Discharge Permits:	17
Surface Water Withdrawals:	5		
Groundwater Withdrawals:	0		
No. of Potable Water Treatment Facilities:	1		

### Sampling Site Statistics:

Number of USGS Gaging Stations:	1
Number of Kentucky Division of Water Sampling Sites:	1
Number of Kentucky Dept. of Fish and Wildlife Sampling Sites:	1
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:	1
Number of Lexington-Fayette Urban Co. Gov. Sampling Sites:	0

Watershed Name:

Dix River

11-Digit Watershed Identity Number:

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**Watershed Indicators and Ranking Categories:**

Overall Watershed Ranking:

Protection Ranking

Observed Impacts

Potential Impacts

Restoration Ranking

High

Low

High

Low

Low

**Protection Categories:**

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Wetland Areas	50	Acres	0 - 106	12
Surface Drinking Water Sources	5	No. of sources	0 - 14	2
Ground Drinking Water Sources	0	No. of sources	0 - 17	1
Groundwater Sensitivity	4.40	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	70	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	1.80	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	1	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	2	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	1.00	Score	1 - 3	1.31
Contamination Sites Impacting Ecological Health	2	Number of sites	0 - 71	4

**Potential Impact Categories:**

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Potential Contamination Sites	13	Number of sites	1 - 121	12
Potential Pesticide Loading	14	Est. sales in tons	0 - 45	10
Potential Fertilizer Loading	950	Est. tons applied	0 - 2747	394
Agricultural Erosion Potential	2.75	Est. tons erosion / acre	0 - 9	3.20
Livestock Operations Potential Impact	23,919	Animal units	55 - 43826	7,021
KPDES Discharge Violations	30	Number of violations	0 - 541	39
KY Division of Water Citizen Complaints	8	Number of complaints	0 - 53	9
Toxic Release Inventory	0	Score	0 - 11547626	231,638
Population Change Projection	546	Number of persons	-149 - 11030	448
Population Not on Public Sewer Systems	1,962	Number of persons	12 - 4511	1,114
Mining Area	0	Acres	0 - 6305	355
Surface Water Runoff Potential	73.53	SCS Curve Number	60 - 79	68
KPDES Permitted Discharges	17	Number of sites	0 - 56	6

Watershed Name:

Dix River

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### Stream and Waterbody Use Support Summary

Total Stream Miles: <span style="border: 1px solid black; padding: 2px;">82.57</span>	Number of Segments	Stream Miles Assessed	Miles * Fully Supporting	Miles * Partially Supporting	Miles * Not Supporting	Miles * Threatened
Segments Assessed:	4	17.3	9.8	0.0	0.0	0.0
Designated Uses						
Aquatic Life:	4	17.3	9.8	0.0	0.0	0.0
Primary Contact:	2	3.0	3.0	0.0	0.0	0.0
Fish Consumption:	2	3.0	3.0	0.0	0.0	0.0
Drinking Water:	1	0	0	0	0	0

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

### Assessed Stream Segments and Waterbodies

Stream or Waterbody Name *	Starting Milepoint	Ending Milepoint	Segment Length (miles)	Designated Uses *	Overall Level of Support
Dix River	73.1	79.9	6.8	AL	Fully Supporting
Dix River	36	43.5	7.5	AL	Not Assessed
Dix River	33	36	3	AL, FC, PC	Fully Supporting
Herrington Lake	0	0	0	FC, PC, SC, DW,	Not Supporting

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

### Causes for Nonsupport or Impairment of Designated Uses

Stream or Waterbody Name *	Starting Milepoint	Ending Milepoint	Segment Length (miles)	Impaired or Threatened Designated Use	Level of Support
Herrington Lake	0	0	0	Aquatic Life Support	Not Supporting
<i>Possible Causes of Impairment:</i>			<i>Possible Sources For Impairment:</i>		
Nutrients, Organic enrichment/Low DO			Agriculture, Internal nutrient cycling (primarily lakes), Land Disposal, Municipal Point Sources, Onsite Wastewater Systems (Septic Tanks)		

\*Abbreviations: UT - Unnamed Tributary

### Applicable Total Maximum Daily Load (TMDL) Reports:

Stream or Waterbody	TMDL Report Status
Dix River	Data collection in progress
Dix River	Data collection in progress

Watershed Name:

Dix River

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**Withdrawal Sites and Discharge Facilities:****Public Water Supplies and Water Withdrawal**

<i>Facility</i>	<i>Origin of Source</i>	<i>Type of Facility</i>	<i>Permit ID Number</i>
DANVILLE CITY WATER WORKS	Surface Water	Water Treatment Plant	0110097
DANVILLE CITY WATER WORKS	Surface Water	Water Withdrawal Site	0110097
NORTH POINT TRAINING CENTER	Surface Water	Water Withdrawal Site	0110664
OLD BRIDGE GOLF CLUB	Surface Water	Water Withdrawal Site	WW1237
OLD BRIDGE GOLF CLUB	Surface Water	Water Withdrawal Site	WW1165

**KPDES Permitted Discharge Facilities**

<i>Facility</i>	<i>Type of Facility</i>	<i>KPDES Site ID Number</i>
CAMP DICK ROBINSON ELEM SCHOOL	ELEMENTARY & SECONDARY SCHOOLS	KY0100421
CHIMNEY ROCK CAMPGROUND	SPORTING & RECREATIONAL CAMPS	KY0092631
HERRINGTON HAVEN SUBD	LAND SUBDIVIDERS & DEV, EX CEM	KY0053431
HIGHLAND TURNER ELEM SCHOOL	ELEMENTARY & SECONDARY SCHOOLS	KY0095010
KEYSTONE BRUSH & CONTACT CO	CARBON AND GRAPHITE PRODUCTS	KY0031844
KY UTIL E W BROWN GEN STA	ELECTRICAL SERVICES	KY0002020
LANCASTER STP	SEWERAGE SYSTEMS	KY0020974
LANCASTER WTP	WATER SUPPLY	KY0003077
PARADISE CONDOMINIUM CO	OPERATORS OF APART BUILDINGS	KY0086550
PERRYVILLE STP	SEWERAGE SYSTEMS	KY0028355
VILLAGE INN RESTAURANT	EATING PLACES	KY0027499

**Gaging Stations and Sampling Sites:****US Geological Survey and US Army Corps of Engineers Stream Gaging Stations**

<i>Stream Location</i>	<i>Agency</i>	<i>Station ID Number</i>	<i>Sampling Parameter</i>
Dix River	USGS	USGS03286200	Flow
Dix River	USGS	USGS03286000	Flow
Dix River	USGS	USGS03285500	Flow
Dix River	USGS	USGS03285005	Flow
Dix River	USGS	USGS03285000	Flow

**KY Division of Water Sampling Sites**

<i>Stream Name</i>	<i>Type of Sampling</i>
Dix River	Other Monitoring

**KY Dept of Fish and Wildlife Sampling / Assessment Sites**

<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>
Dix River 2	Gilberts Creek	Hanging Fork	46.1	50.3	36

**KY River Watershed Watch Sampling Sites**

<i>Stream Name</i>	<i>KRWW Sample ID No.</i>	<i>Site Description</i>
Dix River	K56	0.25mi N of Dix Dam

Watershed Name:

Dix River

11-Digit Watershed Identity Number:

05100205170

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

#### Conventional Parameters:

Sample ID Number: K56 Stream: Dix River

##### Physical Data (May):

pH	7.5	Alkalinity	118
Temperature	12	Total Hardness	148
Dissolved Oxygen	9.4	Chlorides	8.4
		Conductivity	313
		Total Organic Carbon	2.6
		Total Suspended Solids	

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

	Coliform Count	Strep Count	Coliform/Strep Ratio
July	<10	70	<0.14
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: K56 Stream: Dix River

Ammonia		Orthophosphate as Phosphate	0.129	Sulfate	25.9
Ammonia Nitrogen		Orthophosphate as Phosphorus	0.042		
Total Kjeldahl Nitrogen as NH3		Total Recoverable Phosphorus	0.11		
Total Kjeldahl Nitrogen as N					
Nitrate	5.7				
Nitrate Nitrogen	1.28				

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: K56 Stream: Dix River

Aluminum	0.98	Calcium	45.81	Lead		Selenium	0.01	Thallium	
Antimony		Chromium		Lithium	0.01	Silicon	2.01	Vanadium	
Barium	0.03	Cobalt	0.004	Magnesium	9.57	Sodium	5.52	Zinc	0.03
Beryllium		Copper		Manganese	0.01	Strontium	0.08		
Boron	0.12	Iron	0.03	Potassium	2.53	Sulfur	8.31		

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

K56	Dix River			
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Note: All indicators are in micrograms per liter which is equivalent to parts per billion (ppb).