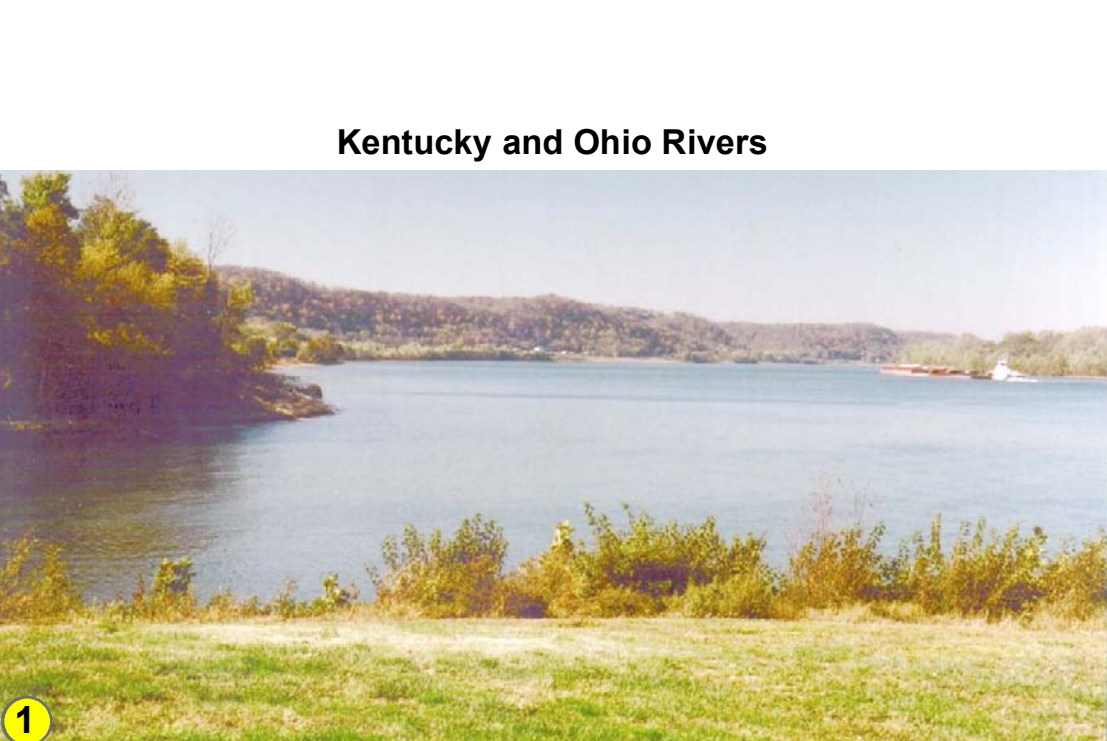


Kentucky River Basin

Kentucky Geological Survey
James C. Cobb, State Geologist and Director
UNIVERSITY OF KENTUCKY, LEXINGTON

Basin Location



The confluence of the Kentucky River with the Ohio River (looking downstream) at the Carrollton City Park. Photo by Paul Potter, University of Cincinnati.

Acknowledgments

Thanks to Terry Hounshell and Meg Smith, Kentucky Geological Survey, for cartographic and editorial improvements. Thanks to Kim and Kent Anness, Kentucky Division of Geographic Information, for base-map data.

Kentucky River Lock and Dam 1, Carroll County



Looking south at the No. 1 Lock and Dam on the Kentucky River south of Carrollton. Photo by Paul Potter, University of Cincinnati.

Hickman Creek, Jessamine County



Hickman Creek just above its mouth at the Kentucky River. The creek drains western Jessamine and southern Fayette Counties over limestone of the Inner Bluegrass. Streams and groundwater can be polluted by development that does not recognize the karst geology.

Old U.S. 27 Bridge and Kentucky River Palisades



The main stem of the Kentucky River provides 80 million gallons of water per day to 600,000 people. It also provides boating, swimming, and fishing recreation. The Kentucky River Palisades support the highest concentration of rare plant species in the Bluegrass Region. The valley walls, almost vertical, rise 400 or more feet above the stream.

Kentucky River Palisades



Generations of Kentuckians have mined and quarried the Camp Nelson Limestone along the Kentucky River for use in road and building construction. Photo by Richard Smith, Kentucky Geological Survey.

LOCK NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Miles above mouth	4.0	31.0	42.0	65.0	82.2	98.2	117.0	139.9	157.5	176.4	201.0	220.9	239.9	249.0
Length of pool above dam (mi)	27.0	11.0	23.0	17.2	14.0	20.8	22.9	17.8	18.9	24.6	19.9	19.0	9.1	--
Date put in operation	1839	1839	1840	1840	1842	1891	1897	1900	1903	1905	1906	1910	1914	1917
Chamber dimensions (ft)	38x145	38x145	38x145	38x145	38x145	52x147	52x147	52x148	52x148	52x148	52x148	52x148	52x148	52x148
Lower sill, elevation	407.00	423.87	437.47	449.75	463.88	478.90	492.42	508.60	526.60	544.60	561.60	579.60	596.60	614.60
Normal pool elevation, lower	421.80	430.05	444.02	456.91	470.60	484.53	499.42	515.39	533.30	550.64	567.19	585.70	602.74	620.65
Lower sill depth (ft) at normal pool	14.80	6.16	6.50	7.38	6.49	6.45	6.88	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Upper sill, elevation	421.80	436.37	448.52	463.95	475.35	489.90	505.44	522.60	540.60	558.60	575.60	593.00	610.00	629.00
Normal pool elevation, upper	430.03	443.97	457.13	470.35	485.35	499.30	514.60	533.26	550.60	567.60	585.00	602.60	619.60	637.60
Upper sill depth (ft) at normal pool	8.23	7.50	8.61	8.40	10.00	9.40	10.00	10.00	10.00	10.00	10.00	10.00	10.00	8.60
Lift—Normal pool to normal pool (ft)	8.23	13.92	13.11	13.44	14.75	14.77	15.18	17.87	17.30	16.96	18.41	16.90	17.86	16.95
Maximum high-water elevation	462.1	493.22	498.32	512.42	525.4	538.94	557.2	573.1	587.4	598.75	615.0	632.25	654.0	669.8
Depth (ft), mean high water above normal upper pool elevation	52.07	49.25	41.19	42.07	40.1	39.64	42.6	39.8	36.8	31.15	29.4	29.85	33.4	27.00
Average annual flow (ft ³ /s)	6,376	7,471	7,344	6,748	6,598	6,509	6,477	6,730	6,290	6,087	6,200	3,847	3,704	3,852
70:10 (ft ³ /s)	14.6	14.6	14.6	13.0	12.6	12.1	12.0	11.2	11.2	11.1	10.0	9.6	9.5	8.9
Date of high water	1937	1937	1937	1978	1978	1978	1978	1978	1978	1978	1978	1939	1920	1939
Type of original lock	stone	stone	stone	stone	stone	stone	stone	stone	stone	concrete	concrete	concrete	concrete	concrete
Type of original dam	masonry	masonry	masonry	masonry	masonry	masonry	masonry	masonry	masonry	concrete	concrete	concrete	concrete	concrete
Type of original dam	timber	timber	timber	timber	timber	timber	timber	timber	timber	timber	timber	timber	timber	timber

Lock and dam data from the Kentucky River Authority. www.kentuckyriverauthority.com/attached-agencies/ldm.htm
Zones of all gages are at all elevations.
All elevations are referred to Kentucky River datum and require variable corrections for conversion to U.S. Coast and Geodetic Survey 1929 general adjustment elevations.
To view recent stage readings, go to waterdata.usgs.gov/nw/usa/river/typeflow
Maximum high-water elevations at locks 5, 7, 8, 9, and 11 are based on profile data.
Maximum low-water flow that occurs, on average, once every 10 years.
Flow data from U.S. Geological Survey. <http://waterdata.usgs.gov/nw/usa/river/typeflow>

Daniel I. Carey

The Kentucky River Basin's nearly 7,000 square miles in 42 counties contain 16,000 miles of streams. From a hill in Letcher County 3,250 feet above sea level, the Kentucky River runs down the Eastern Kentucky Coal Field, Knobs, and Bluegrass Regions to the Ohio River at 420 feet above sea level. Along the way the river washes rocks laid down as sediments over a period of 150 million years—past the 300-million-year-old sandstone, siltstone, shale, and coal from the Pennsylvanian to the 450-million-year-old Ordovician limestones in central Kentucky. The oldest rocks exposed at the surface in Kentucky are the Camp Nelson limestones at the base of the Kentucky River Palisades in central Kentucky. Residents draw about 100 million gallons of water per day from streams and reservoirs in the basin. The Kentucky River's 14 dams create 9,700 acres of pools with over 100,000 acre-feet of storage for drinking-water supplies. On average, about 5,400 million gallons per day (mgd) flow into the Ohio, but about once every 10 years, only 9.4 mgd will flow for the month of a week. This variability in flow affects water users and stream life. Man-made lakes cover 8,200 acres. The largest are Herrington, 2,940 acres; Buckhorn, 1,230 acres; and Carr Fork, 710 acres. There are 33,600 acres of lacustrine and palustrine wetlands in the basin. More than 1,125 miles of streams in the basin do not fully support designated uses for warm-water aquatic habitat, primary contact recreation, secondary contact recreation, or fish consumption. Most streams have not been assessed. The percentage of assessed streams not supporting use was: warm-water aquatic habitat (42%); fish consumption (26%); primary contact recreation (46%). More than 335 miles of streams have been declared special use waters: either exceptional waters, or reference reaches. More than 2,075 square miles of the basin have been designated as priority watersheds, impacted by pathogens, nutrients, habitat alterations, siltation, low dissolved oxygen, and metals.

North Elkhorn Creek, Scott County



Turtles sunbathe at this quiet bend on North Elkhorn Creek in Scott County. Elkhorn Creek has some of the best smallmouth bass fishing in the state. Maintaining water quality for recreation and wildlife presents special problems in karst regions such as central Kentucky.

River Cleanup



Friends of the Red River periodically leads cleanups of the river. In this photo, volunteers use canoes and kayaks to collect discarded tires from the river for proper disposal. Photo by Russ Miller.

Ancient Kentucky River Deposits, Woodford County



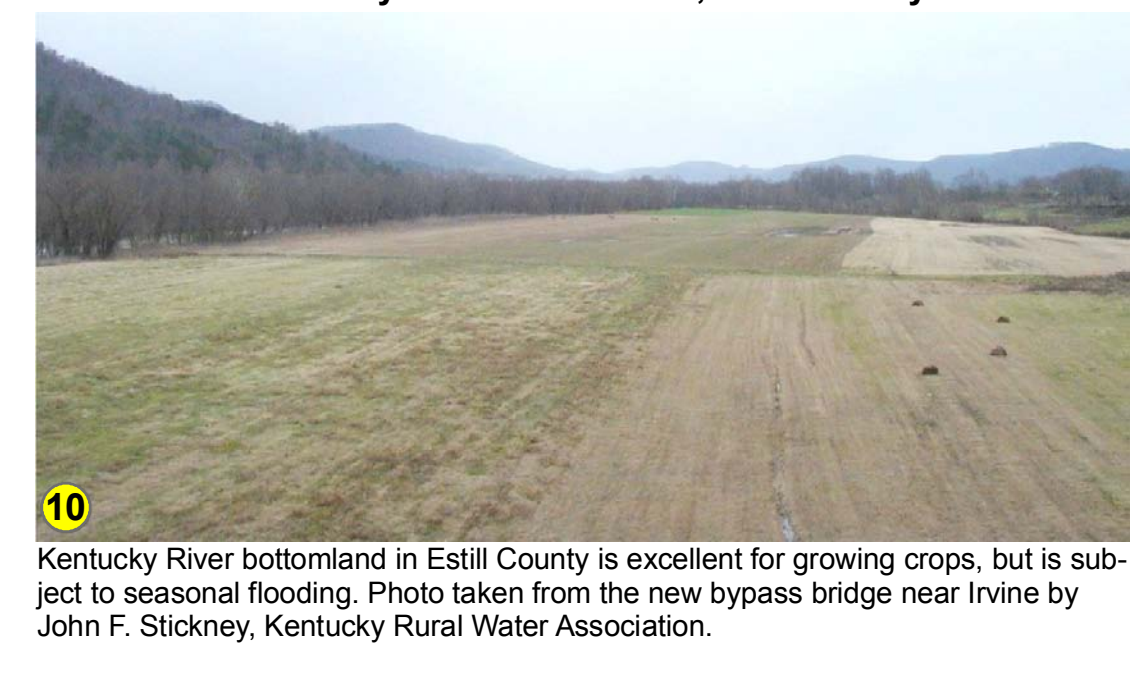
The valley remains, but the river is gone. High-level deposits of silt, sand, and gravel along Mundys Landing Road in southern Woodford County are remnants of the ancient Kentucky River that flowed through the Inner Bluegrass 5 million years ago. At that time, the land was uplifted, diverting the river to its current course. There are a number of these old valleys in the uplands along the Kentucky River.

No Child Left Inside



Powell County High School students learned water-quality sampling techniques through a watershed grant project funded by the Kentucky River Authority. Students studied water chemistry, stream habitat, macroinvertebrates, and freshwater mollusks. Photo by Kim Feaman.

Kentucky River Bottomland, Estill County



Kentucky River bottomland in Estill County is excellent for growing crops, but is subject to seasonal flooding. Photo taken from the new bypass bridge near Irvine by John F. Stickney, Kentucky Rural Water Association.

Karst Hydrology—Bluegrass Region

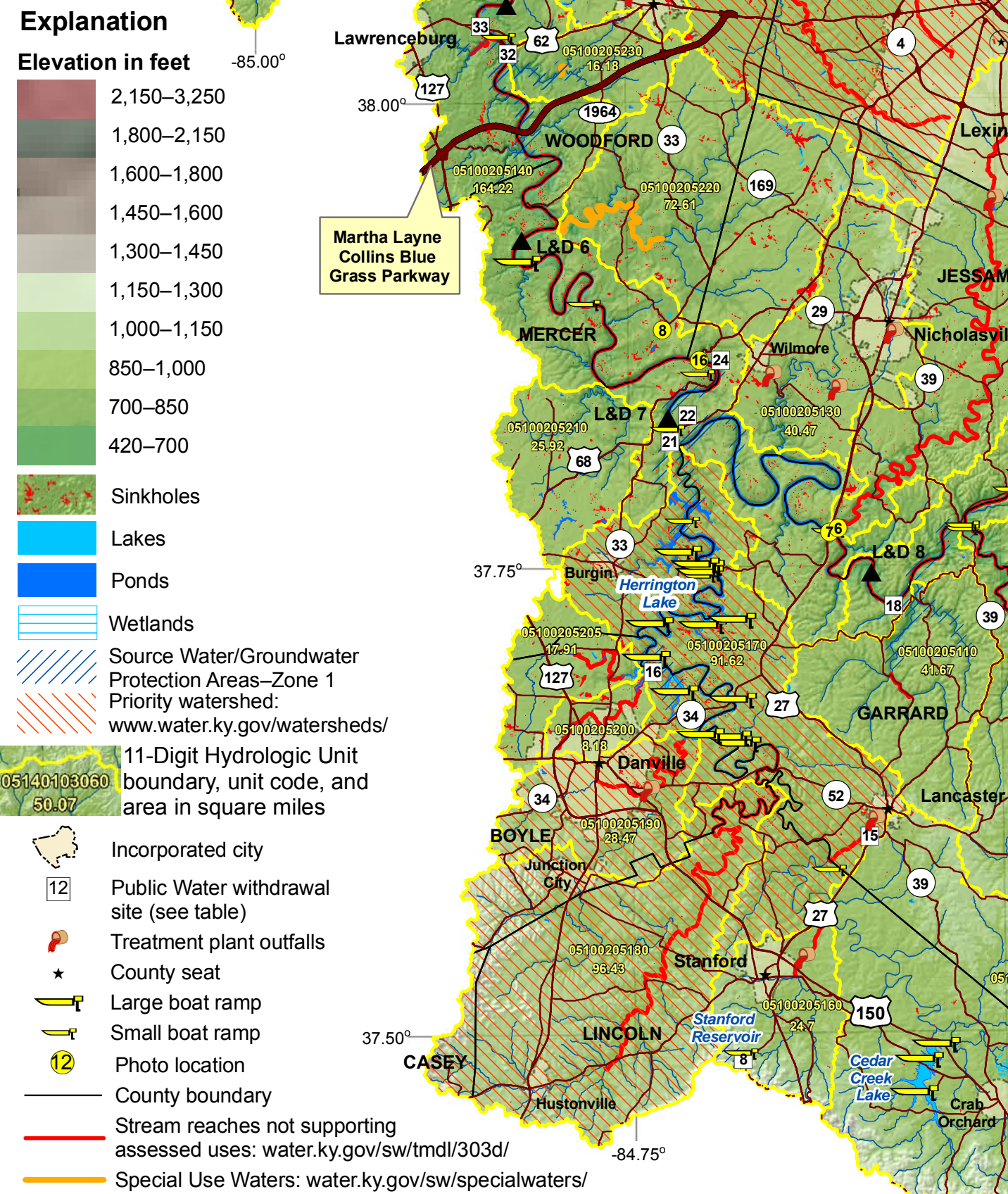


Long after the clouds have gone, the Big Sink in Woodford County retains runoff from the storms. Sinkholes in the Inner Bluegrass lead to underground channels and act as natural detention basins. The water drains slowly to underground conduits in the limestone. After journeying perhaps miles underground, the water will reemerge from a spring near a stream.

North Fork of the Kentucky River at Jackson, Breathitt County



The North Fork of the Kentucky River, seen here during the drought of 2007, provides water for Jackson Municipal Water Works. The Middle Fork of the Kentucky River and Buckhorn Lake are also potential sources of water.

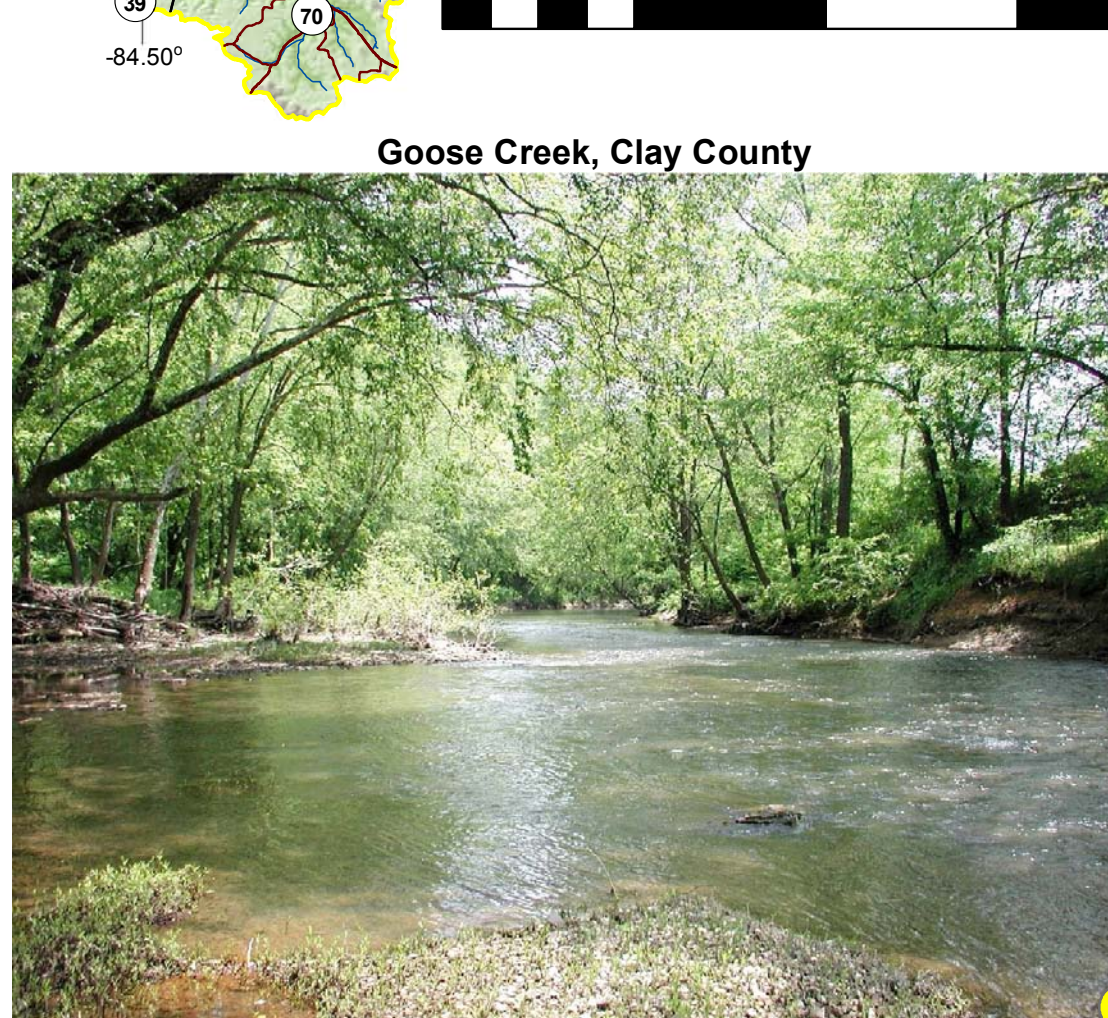


Explanation

- Elevation in feet: 2,150–3,250; 1,800–2,150; 1,600–1,800; 1,450–1,600; 1,300–1,450; 1,150–1,300; 1,000–1,150; 850–1,000; 700–850; 420–700
- Sinkholes
- Lakes
- Ponds
- Wetlands
- Source Water/Groundwater Protection Areas—Zone 1 Priority watershed: www.water.ky.gov/watersheds/11-Digit-Hydrologic-Unit-boundary-unit-code-and-area-in-square-miles
- Incorporated city
- Public Water withdrawal site (see table)
- Treatment plant outfalls
- County seat
- Large boat ramp
- Small boat ramp
- Photo location
- County boundary
- Stream reaches not supporting assessed uses: water.ky.gov
- Special Use Waters: water.ky.gov/sw/specialwaters/

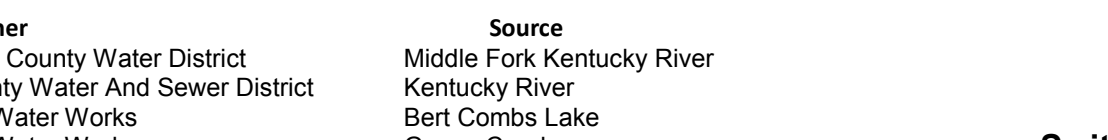
Scale = 1:316,800
1 inch equals 5 miles

Raven Run



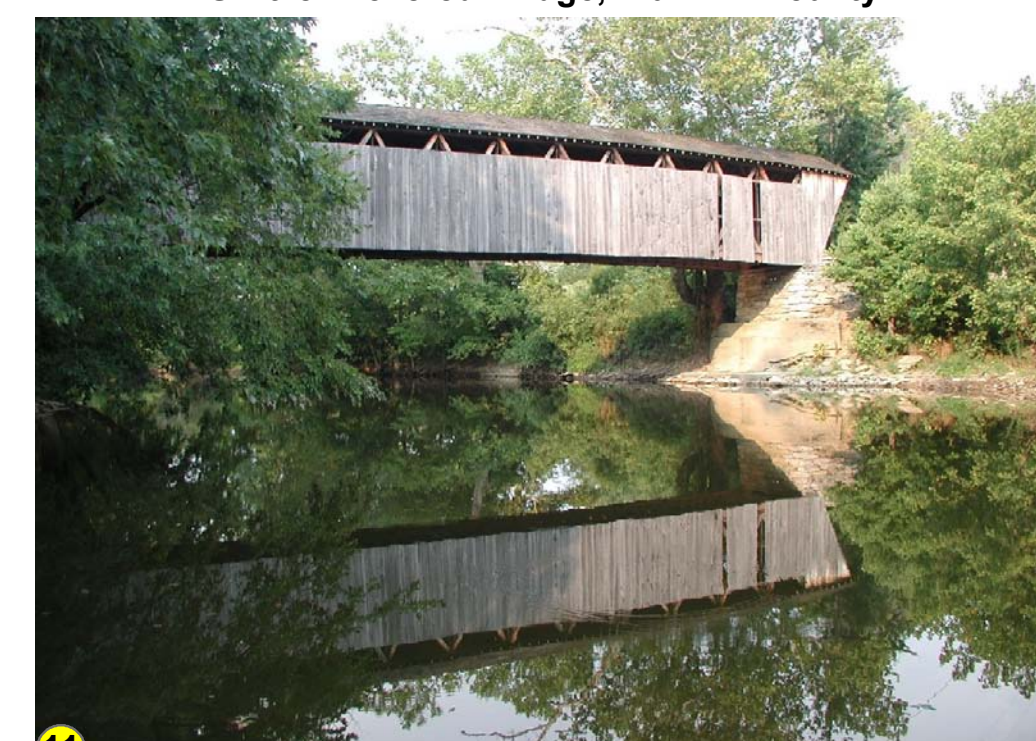
Raven Run Creek. Raven Run is a unique, 470-acre nature sanctuary dedicated to preserving the natural beauty of the Kentucky River Palisades and early Kentucky history. Over 10 miles of hiking trails provide access to streams, meadows, and woodlands characteristic of the area. Numerous 19th century remnants from early settlers, as well as over 600 species of plants, allow visitors to become acquainted with and appreciate the natural world. Raven Run also accommodates over 200 species of birds throughout the year. Photo by Jim Rebnann, Lexington-Fayette Urban County Government.

Goose Creek, Clay County



Goose Creek and other streams throughout the basin offer scenes of quiet beauty.

Switzer Covered Bridge, Franklin County



Covered bridges were once common in Kentucky. The Switzer Covered Bridge carried KY 1262 across North Elkhorn Creek at Switzer in eastern Franklin County. It is a 120 foot long Howe truss design built in 1855 and restored in 1908 and again in 1990. On March 1, 1997 the bridge was washed away in a flood and was restored in 1998. Photo by Brandon Nuttall, Kentucky Geological Survey.

Carr Fork Lake, Knott County

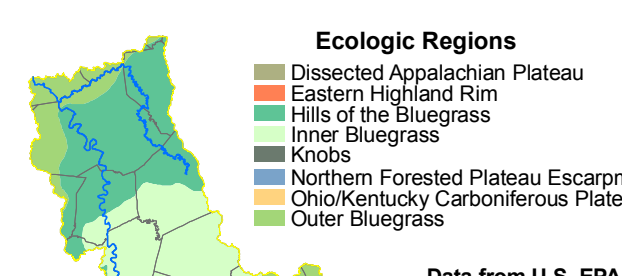


Two faces of the eastern Kentucky economy can be seen in this photo of Carr Fork Lake in Knott County. The lake's 710 acres and 24 miles of shoreline provide for swimming, fishing, boating, water sports, camping, hiking, and wildlife habitat. A coal-mining operation can be seen in the background.

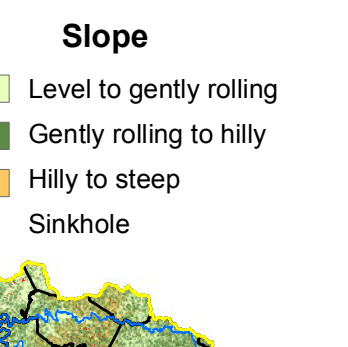
Kentucky River Lock and Dam 14, Lee County



Lee County is blessed with an abundance of water. The North, South, and Middle Forks of the Kentucky River meet upstream of Heidelberg, the site of Lock and Dam 14. The dam (seen from the Albert Updyke Ky. 399 Bridge) was completed in 1917 as the last in the system—began in 1836—from Heidelberg to the Ohio River.



Geologic Regions
Dissected Upland Plateau
Eastern Highland Rim
Hills of the Bluegrass
Inner Bluegrass
Knobs
Northern Forested Plateau Escarpment
Outer Bluegrass
Data from U.S. EPA



Slope
Level to gently rolling
Gently rolling to hilly
Hilly to steep
Sinkhole

