

Four Rivers Basin: Cumberland, Tennessee, Ohio, Mississippi

Daniel I. Carey

The Four Rivers Basin includes over 4,700 square miles in all or parts of 17 counties. The basin contains more than 10,700 miles of streams. More than 720 miles of streams assessed in the basin by the Kentucky Division of Water do not support designated uses for warm-water aquatic habitat, fish consumption, primary contact recreation, or secondary contact recreation. Not all streams have been assessed. The percentage of assessed streams not supporting uses was: warm-water aquatic habitat (58 percent); fish consumption (14 percent); primary contact recreation (76 percent); secondary contact recreation (30 percent). Nearly 125 miles of streams have been declared special use waters: either exceptional waters or reference reach waters. For more information on the assessment process and stream ratings, go to www.water.ky.gov/sws/monitor/303d/.

There are five remediation priority watersheds including 640 square miles: primary impacts are pathogens, nutrients, siltation, habitat alteration, and low dissolved oxygen caused by agriculture, municipal sewer systems, and channelization.

There are 10 large man-made lakes in the basin. Kentucky Lake and Lake Barkley provide nearly 100,000 acres for recreation in Kentucky. Two million visitors a year enjoy the 170,000 acres and 300 miles of undeveloped shoreline of the Land Between the Lakes.

Mouth of the Cumberland River



Looking northeast at the mouth of the Cumberland River along the Ohio from the overlook at Smithland. Photo by Paul Potter, University of Cincinnati.



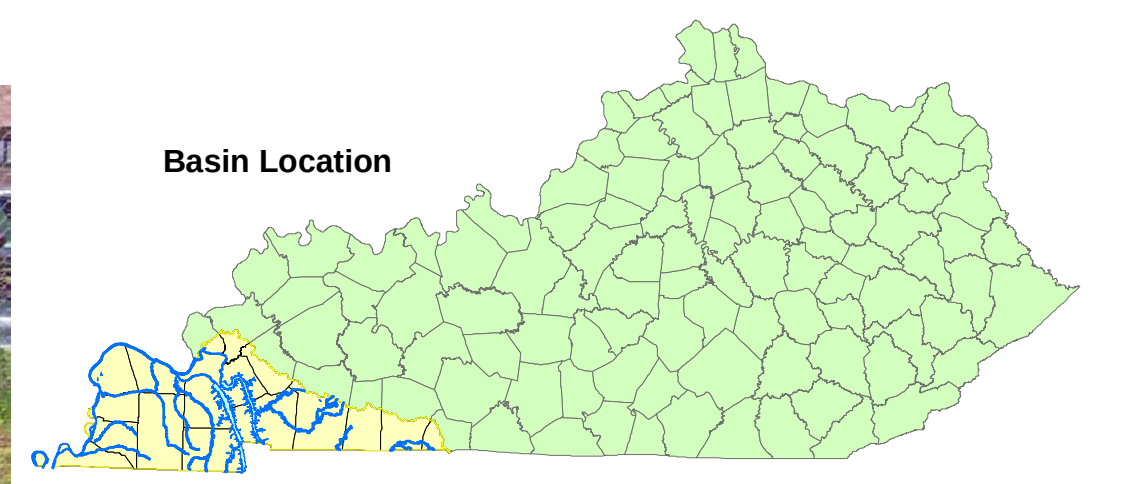
Groundwater is a valuable resource to residents, industry, and farmers in the basin. Kight Pecan Orchard (above, left), the largest pecan orchard in the state (80 acres), uses groundwater for drip irrigation. Traditional row crops use groundwater for spray irrigation (below, left). Most communities in the basin rely on groundwater for their public water supply. The city of Murray and parts of Calloway County use five municipal water wells to produce drinking water. The well shown above (right) here is 200 feet deep and pumps 1,000 gallons of water per minute. Proper resource management and planning will be essential to preserving good groundwater quality in the basin. Photos by Glynn Beck, Kentucky Geological Survey.

Groundwater Resources



More Information

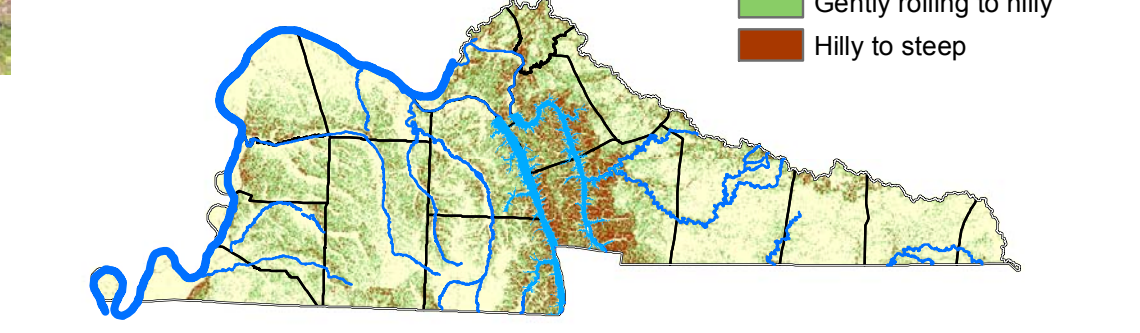
Boating and Fishing Access Sites, Kentucky Department of Fish and Wildlife Resources: kygeonet.ky.gov/kdfr/
Four Rivers Basin: watersheds.ky.gov/basins/four_rivers/
Four Rivers Watershed Watch: kywater.org/watch/fourrivers/
Kentucky Division of Water: water.ky.gov
Kentucky Watershed Viewer: epppmaps.ky.gov/website/watershed/
Kentucky Water Resources Research Institute: www.uky.edu/WaterResources/
Kentucky Geological Survey: www.uky.edu/kgs/waterlibrary/
U.S. Geological Survey surface-water data: water.usgs.gov/osw/
Water Watch: water.ky.gov/ww/
Water Watch Data: kgsmap.uky.edu/website/krrw/



Basin Location

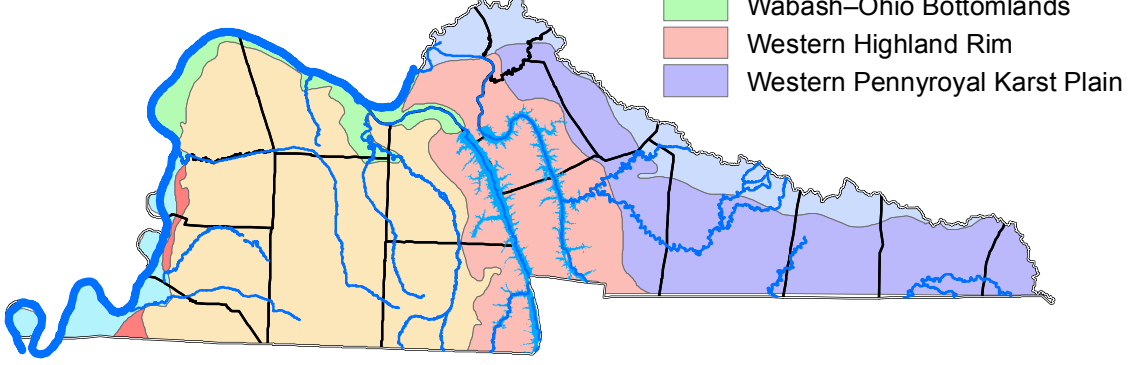
Slope

- Level to gently rolling
- Gently rolling to hilly
- Hilly to steep



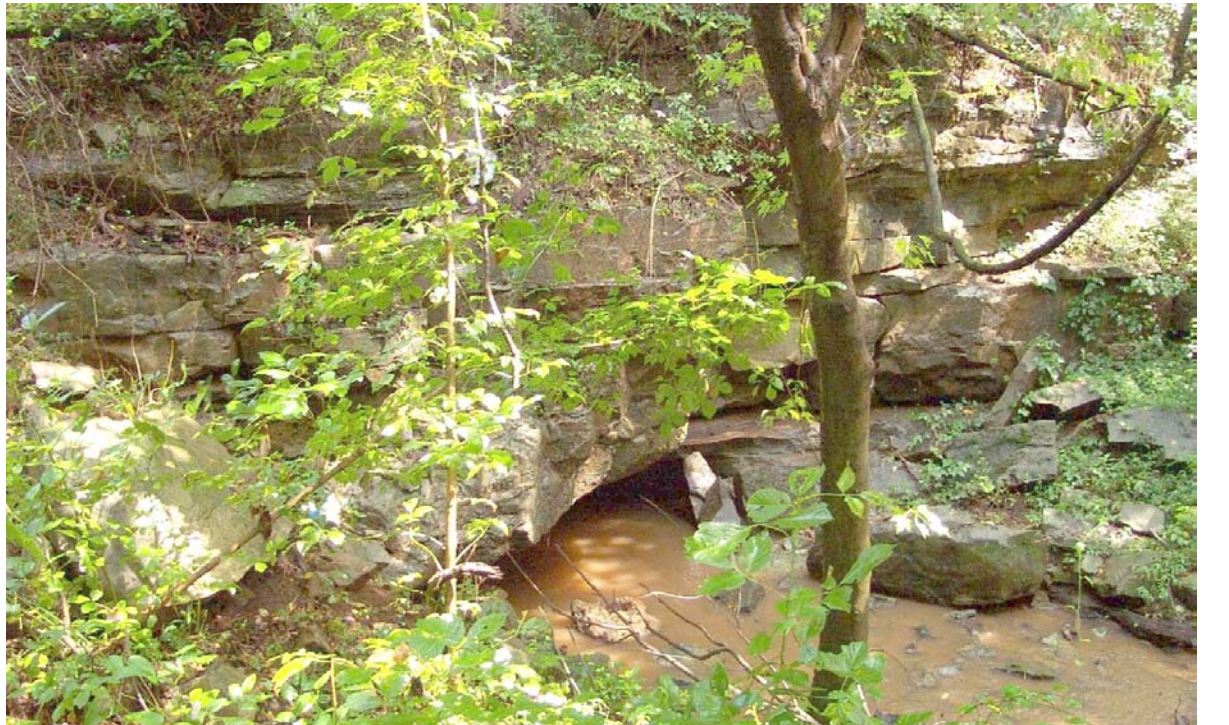
Ecologic Regions

- Bluff Hills
- Crawford-Mammoth Cave Uplands
- Holocene Meander Belts
- Loess Plains
- Wabash-Ohio Bottomlands
- Western Highland Rim
- Western Pennyroyal Karst Plain



Data from the U.S. Environmental Protection Agency: epa.gov/wed/pages/ecoregions/ky_eco.htm

Karst



The Western Pennyroyal Karst Plain ecoregion is dominated by karst features such as sinkholes, springs, and sinking streams. Photo by Glynn Beck, Kentucky Geological Survey.



Flooding

This photo of the 1937 flood in Paducah was taken before the Ohio River crested on February 2, 1937. Floodwaters covered more than 90 percent of the city, and flood damage exceeded \$22 million. Photo courtesy of the William Clark Market House Museum.



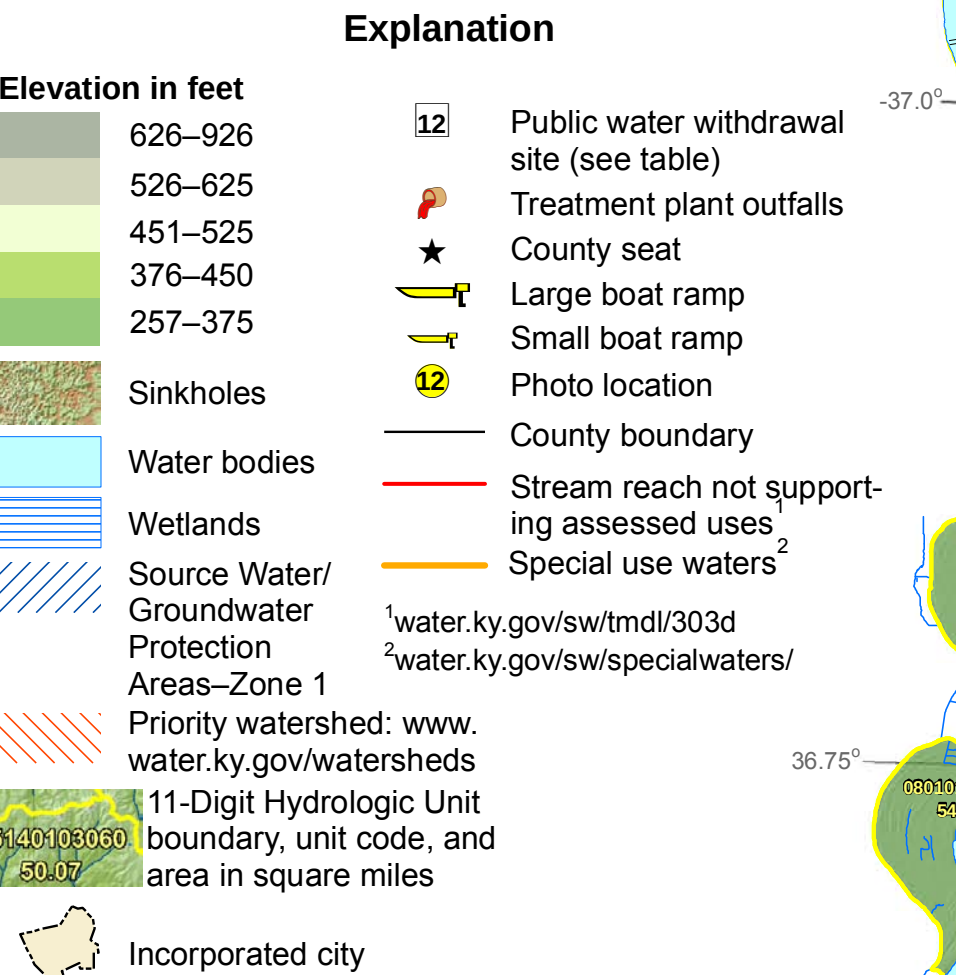
Flood Protection

This 12.5-mile floodwall was constructed by the U.S. Army Corps of Engineers after the 1937 flood to prevent future flooding in Paducah. Photo by Glynn Beck, Kentucky Geological Survey.



Mighty Rivers, Ballard County

The confluence of the Ohio and Mississippi Rivers. This picture was taken at Fort Defiance State Park, II, looking southeast toward the city of Wickliffe in Ballard County. Photo by Glynn Beck, Kentucky Geological Survey.



Explanation

- Elevation in feet
 - 626-926
 - 526-625
 - 451-525
 - 376-450
 - 257-375
- Sinkholes
- Water bodies
- Wetlands
- Source Water/
 - Groundwater
 - Protection
 - Areas-Zone 1
 - Priority watersheds: 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 reach not supporting assessed uses
- Special use waters
- water.ky.gov/sw/mdl/303d/
- water.ky.gov/sw/specialwaters/



Mississippi River

Exposed bar on Mississippi River in fall of 1983. Wolf Island in background. Photo by Paul Potter, University of Cincinnati.



Cypress Swamp

A typical cypress swamp located in the Obion Creek drainage. Most of Obion Creek drains the Loess Plains ecoregion. Photo by Glynn Beck, Kentucky Geological Survey.



Kentucky Lake Dam

The 60-year-old Kentucky Lake Dam, constructed by the Tennessee Valley Authority on the Tennessee River, is 206 feet high and 8,422 feet long. Kentucky Lake provides flood protection to millions of acres of land along the lower Ohio and Mississippi Rivers. Kentucky Dam also produces hydroelectric power, and has a generating capacity of 184,000 kilowatts. Photo by Glynn Beck, Kentucky Geological Survey.



Land Between the Lakes

Elk herd in the Land Between the Lakes National Recreation Area. Two million visitors a year come to the 170,000 acres and 300 miles of undeveloped shoreline to experience the beauty and wildlife of the region. Photo by Glynn Beck, Kentucky Geological Survey.

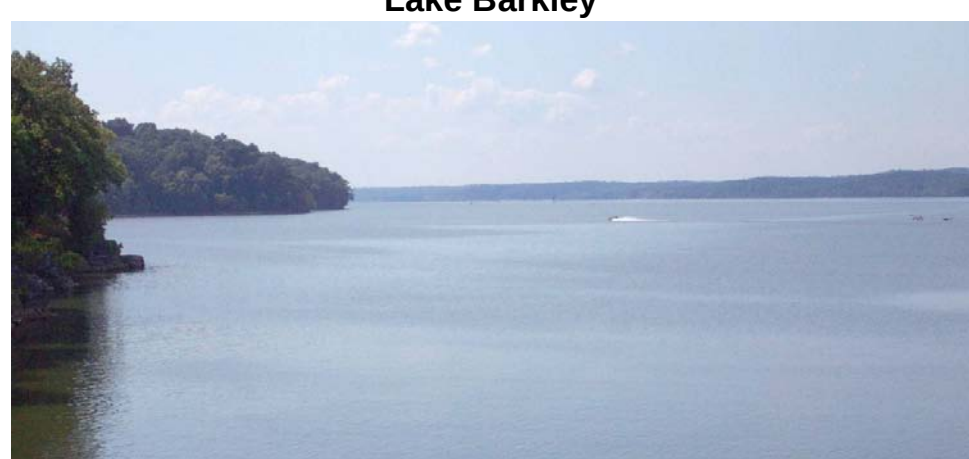


Fish Farming

More than 60 catfish ponds are in Graves County. After harvesting, the fish are trucked to the processing plant, located at the Purchase Area Aquaculture Cooperative. The processing plant is currently running at 30 percent capacity. To get the plant to 80 percent capacity, 1,000 more acres of ponds are needed. Photo courtesy of Roberta Bonk, Purchase Area Aquaculture Cooperative.

Water Body	Site Name
Kentucky Lake	Wildcat public access
Lake Barkley	Eddy Creek public access
Lake Barkley	Eureka ramp
Lake Barkley	Kuttawa Harbor ramp
Lake Barkley	Kuttawa/Jon County Boat Ramp
Lake Barkley	Lake Barkley State Park
Lake Barkley	Barge Island public use area, Birmingham Point
Lake Barkley	Beer Spring Lodge
Lake Barkley	Big Bear public use area
Lake Barkley	Boyd's Branch
Lake Barkley	Harry Lee Waterfield Park
Lake Barkley	Jonathan Creek/U.S. 68
Lake Barkley	Ken Lake State Park
Lake Barkley	Kentucky Dam Marina and State Park
Lake Barkley	Lighthouse Marina
Lake Barkley	Little Jonathan Creek-Ky. 80 ramp
Lake Barkley	Moore's Resort
Lake Barkley	Pattersons Point
Lake Barkley	Sportsman Anchor Resort
Lake Barkley	Town and Country
Lake Barkley	Mineral Mound State Park
Lake Barkley	Prizer Point
Lake Barkley	Haddock Ferry
Lake Barkley	U.S. 62/64 west of Eddyville, left on Ky. 810, left at Buzzard Rock sign
Lake Barkley	Canal Campground ramp
Lake Barkley	Double Creek
Lake Barkley	Mississippi River
Mississippi River	Island No. 8 ramp
Mississippi River	Wickliffe water front
Ohio River-West	Broadway Street ramp

Data from the Kentucky Department of Fish and Wildlife Resources. For boat access information throughout the basin, go to kygeonet.ky.gov/kdfr/.



Lake Barkley

Lake Barkley was formed when the Cumberland River was impounded in the early 1960's. Over 18,500 acres of the lake are in Trigg County. Lake Barkley is an excellent resource for boating, fishing, and other activities. Photo by Glynn Beck, Kentucky Geological Survey.

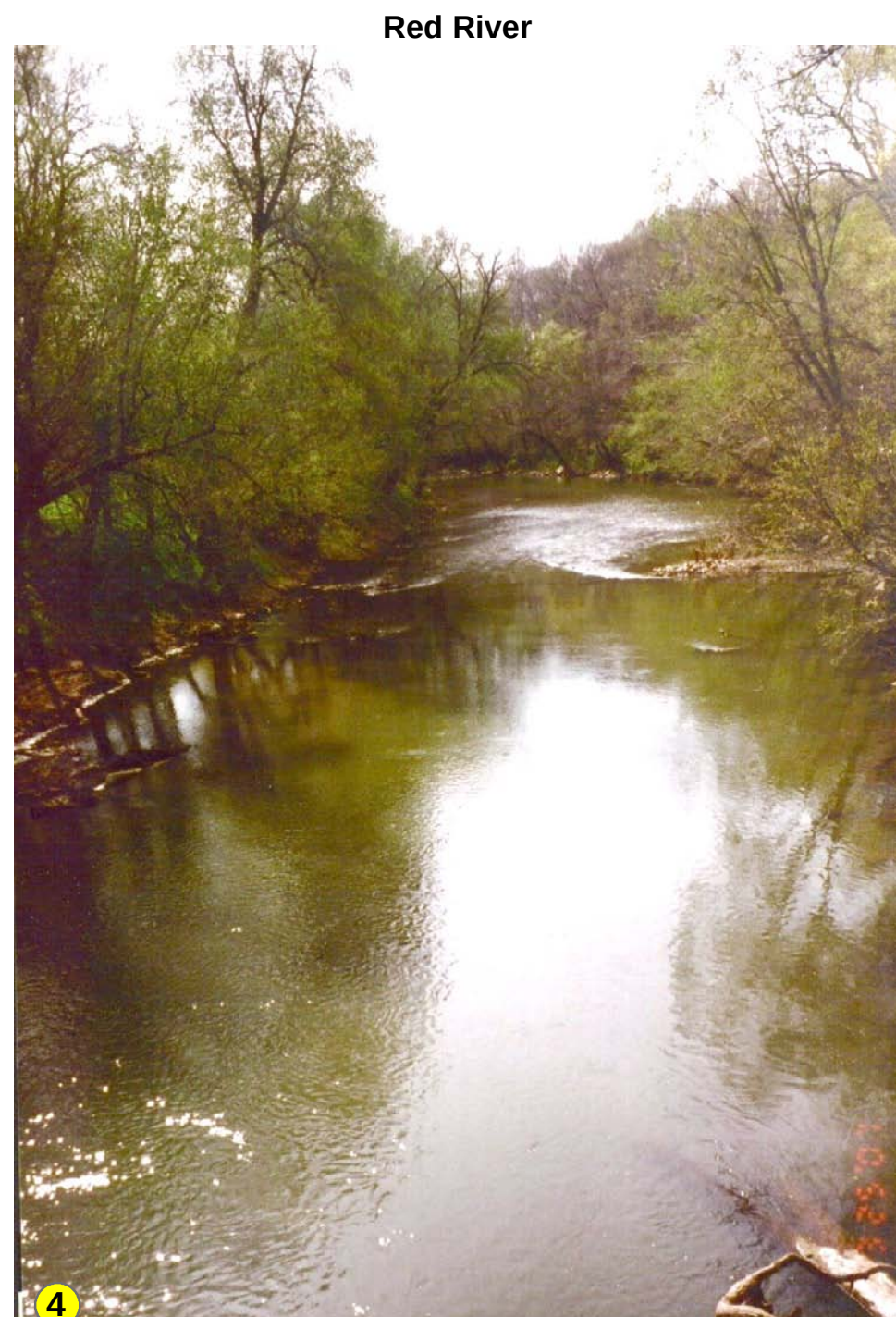
Water Quality



Slow-flowing streams such as the East Fork of the Clarks River are prevalent in the Loess Plains ecoregion. Because of the large percentage of flat to gently sloping areas, developments such as subdivisions can cause flooding if proper drainage designs are not implemented. These streams are susceptible to impairment from improper sewage treatment and agricultural, urban, and industrial runoff contamination. Allowing natural vegetation to thrive along the stream bank is an excellent way to maintain good surface-water quality. Photo by Glynn Beck, Kentucky Geological Survey.

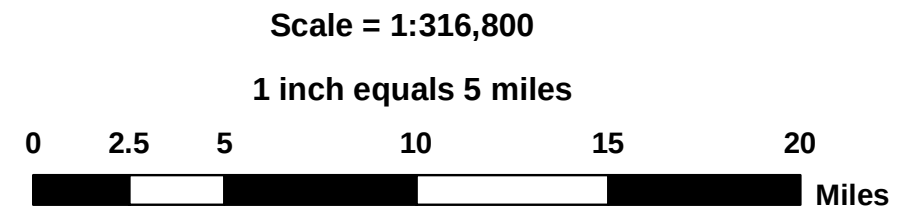
Large Boat Ramp Information

Directions	Fee	Latitude	Longitude
Ky. 94 east of Murray; right on Ky. 280; left on Ky. 614 to end of road	no	36.611480	-88.134870
Ky. 53 south of Eddyville (7 miles); follow signs	no	37.082620	-88.018430
U.S. 62/64 west of Eddyville; left on Ky. 810; right on highway 1271 (to ramp)	no	37.062320	-88.200280
U.S. 62/64 west of Eddyville; left on Ky. 295 to lake	yes	37.061080	-88.106250
From U.S. 62/64, south on Ky. 285, pass under I-24 at dam, ramp is on left, 0.25 mile south of I-24	no	37.058020	-88.228970
U.S. 68/80 west of Cadiz to park entrance	yes	36.853230	-87.942840
Ky. 408 east of Benton; right on U.S. 68, left on Ky. 962 to end of road	no	36.906680	-88.226890
Ky. 408 east of Benton; right on U.S. 68, left on Ky. 963 to Moor's Resort	yes	36.898920	-88.202890
Ky. 408 east of Benton; left on U.S. 68; right on Ky. 58 to end of road	no	36.895710	-88.222570
Ky. 121 south of Murray; left on Ky. 444 (7 miles); follow signs	no	36.603210	-88.074390
Ky. 408 east of Benton; right on U.S. 68, ramp on left after crossing Jonathan Creek bridge	no	36.804560	-88.200170
Ky. 408 east of Benton; right on U.S. 68, left on ramp just before Jonathan Creek bridge	no	36.805280	-88.203110
Ky. 408 east of Benton; right on U.S. 68 to Aurora; right on Ky. 94 to state park entrance	no	37.053820	-88.090140
U.S. 641 north of Benton to state park entrance	no	37.002090	-88.283010
Ky. 463 south of Smithland on right prior to crossing canal	no	36.994946	-88.241288
U.S. 641 south of Benton; right on Ky. 402 east; boat ramp on right side of road after crossing Jonathan Creek bridge	no	36.784260	-88.232970
Ky. 408 east of Benton; left on U.S. 58, right on Ky. 963 to Moor's Resort	yes	36.918450	-88.218200
Ky. 121 south of Murray; left on U.S. 68; right on U.S. 68 to river; ramp on last road on right	no	36.522750	-88.054090
Ky. 408 east of Benton; right on U.S. 68, ramp on right just past Jonathan Creek bridge	yes	36.803090	-88.202050
Ky. 408 east of Benton; right on U.S. 68, left on Bear Road after crossing Jonathan Creek bridge	yes	36.803940	-88.183680
Ky. 53 south of Eddyville; right at Mineral Mound State Park ramp sign	no	37.053820	-88.090140
Ky. 778 northwest of Cadiz; left on Ky. 276; right on Ky. 274	yes	36.914890	-87.976310
Ky. 463 south of Smithland to Haddock Rock (5 miles)	no	37.063620	-88.333980
U.S. 62/64 west of Eddyville; left on Ky. 810, left at Buzzard Rock sign	yes	37.062070	-88.143370
Ky. 463 south of Smithland; left at sign for Canal Campground prior to crossing canal	yes	36.998930	-88.209770
Ky. 463 south of Smithland; left on U.S. 62/64/E; right on Ky. 917	no	37.016810	-88.228940
Ky. 58 west of Clinton through Columbus; follow Ky. 963 to river; ramp on last road on right	no	36.753630	-89.113180
Ky. 166 west of Fulton to Ky. 125; west on Ky. 94 bypass (Ky. 1099) south of Hickman; left on Sassafras Ridge Road; right on Ky. 653; left on Lewis Road to ramp	no	36.576207	-89.365260
In Wickliffe at end of Ky. 121	no	36.964650	-89.094570
End of Broadway Street in Paducah	no	37.088430	-88.594620



Red River

Looking downstream at the Red River from bridge at Dot, Logan County. St. Louis Limestone forms bedrock. Photo by Paul Potter, University of Cincinnati.



Sinkholes

Sinkholes are natural drainage points for groundwater and should never be used as trash dumps. One way to protect sinkholes is by using geosynthetic materials and rip-rap, which help to control further soil erosion. Pictured above is a sinkhole that has been protected on the T.L. Maddux farm in Livingston County. This sinkhole protection was funded by the Kentucky Soil Erosion and Water Quality Cost Share Program through the Livingston County Conservation District. Photo by Glynn Beck, Kentucky Geological Survey.



Clarks River National Wildlife Refuge

Clarks River National Wildlife Refuge comprises over 7,000 acres and is the only national wildlife refuge solely located within the state of Kentucky. The refuge begins just south-east of Benton and extends nearly to Paducah, but most of the refuge is in Marshall County. Photo by Glynn Beck, Kentucky Geological Survey.

Boat Ramp

The new Barkley boat ramp will make the Mississippi River more accessible to residents of Carlisle County. Ramp construction is a cooperative effort between the U.S. Army Corps of Engineers, Kentucky Department of Fish and Wildlife, and Carlisle County. Photo by Glynn Beck, Kentucky Geological Survey.

