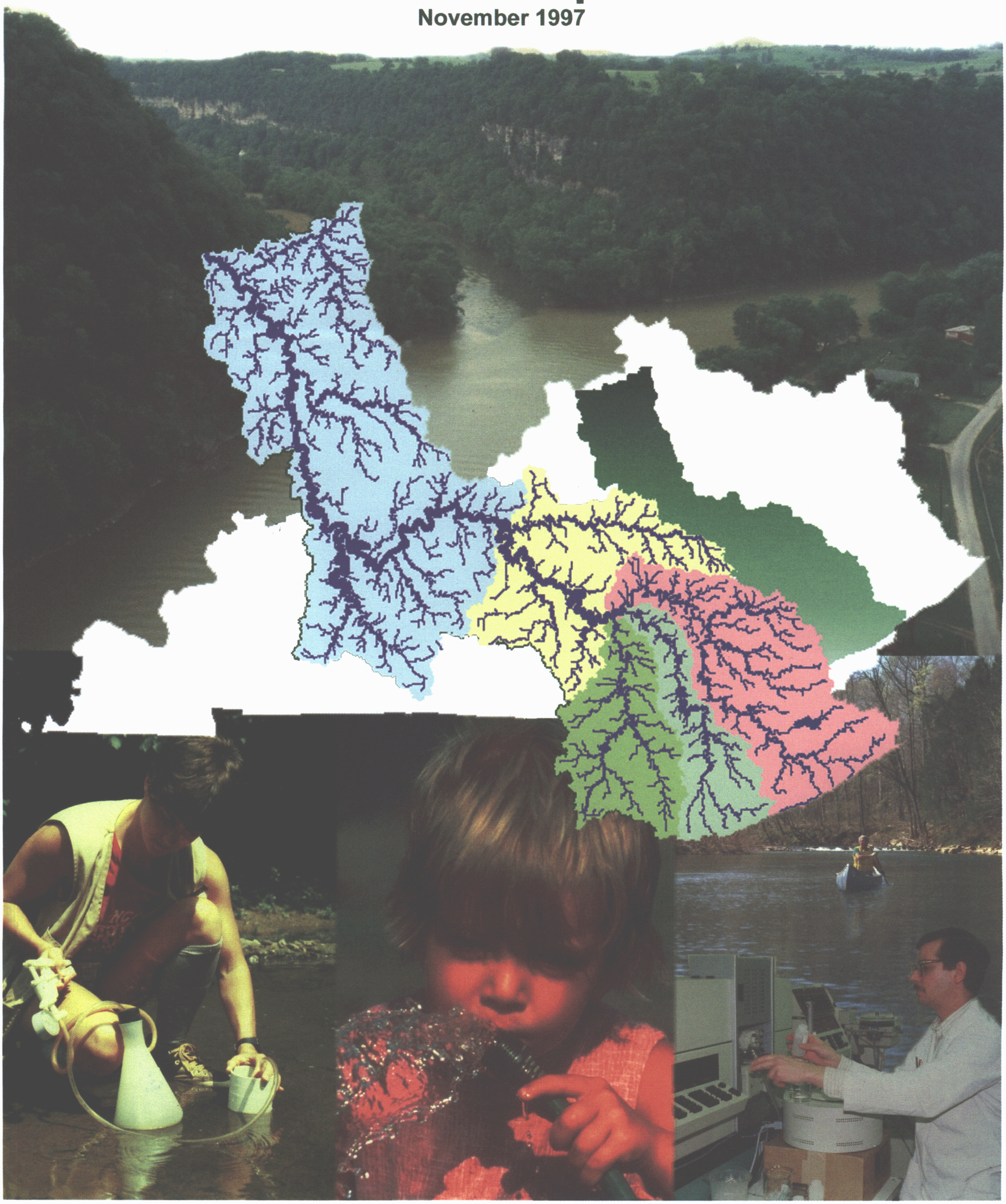
Kentucky River Basin Status Report

November 1997



ACKNOWLEDGEMENTS

This document is the collaborative effort of several agencies and organizations. The Kentucky River Authority and the Division of Water were the lead agencies in preparing the text and graphics, and in compiling the document. Other contributors included the Kentucky Department of Fish and Wildlife Resources, U.S. Fish and Wildlife Service, Kentucky Geological Survey, and Kentucky Waterways Alliance.

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FOREWORD

The Kentucky Watershed Management Framework serves to coordinate and integrate existing programs, tools, resources, groups, and agencies. **Through it, the ecological structure and function can be restored, maintained, and protected, and sustainable uses of the watershed can be supported.**

The first activity under Phase I (Scoping and Data Gathering) of the basin management cycle (Fig. 1) is the Basin Status Report. Kentucky is divided into five basin management units (Fig. 2). Each basin management unit produces a Basin Status Report to describe conditions and trends in water quality and quantity as well as watershed integrity.

The information contained in this Basin Status Report for the Kentucky River Basin is intended to provide an interdisciplinary overview of the basin—providing information that will serve as indicators of the basin's condition and predictors of areas needing attention. This report will assist the Kentucky River Basin Team in preparing a strategic data collection plan and will provide the public with background information on the basin. Phase II will involve review and assessment of the data that have been collected. Phase III of the cycle is intended to identify those subwatersheds within the Kentucky River Basin that are in most urgent need of attention. Phase IV will entail development of a watershed management plan and action strategies for the priority watersheds. Phase V will lead to implementation of the management plans.

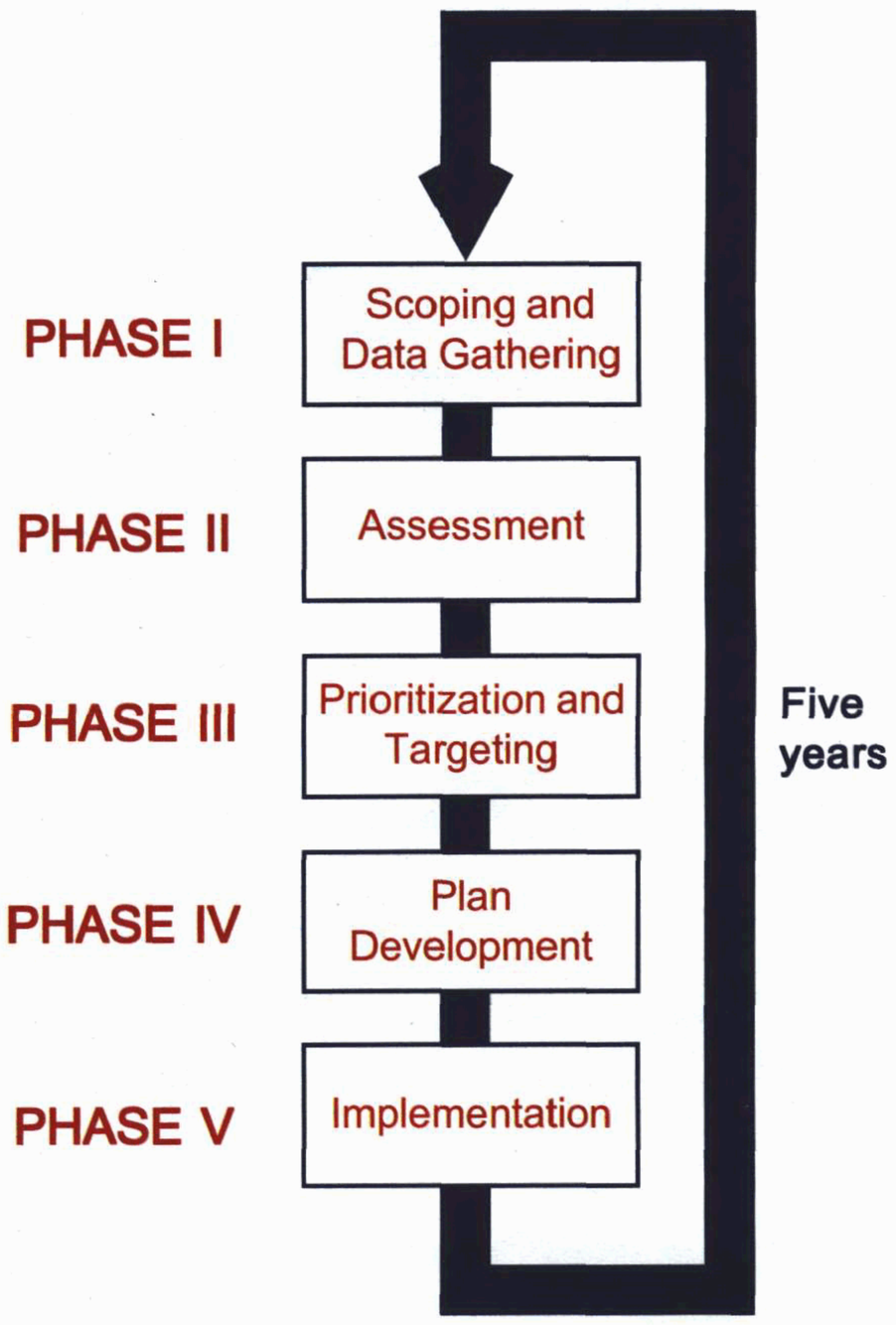


Figure 1: Basin Management cycle under the Kentucky Watershed Management Framework

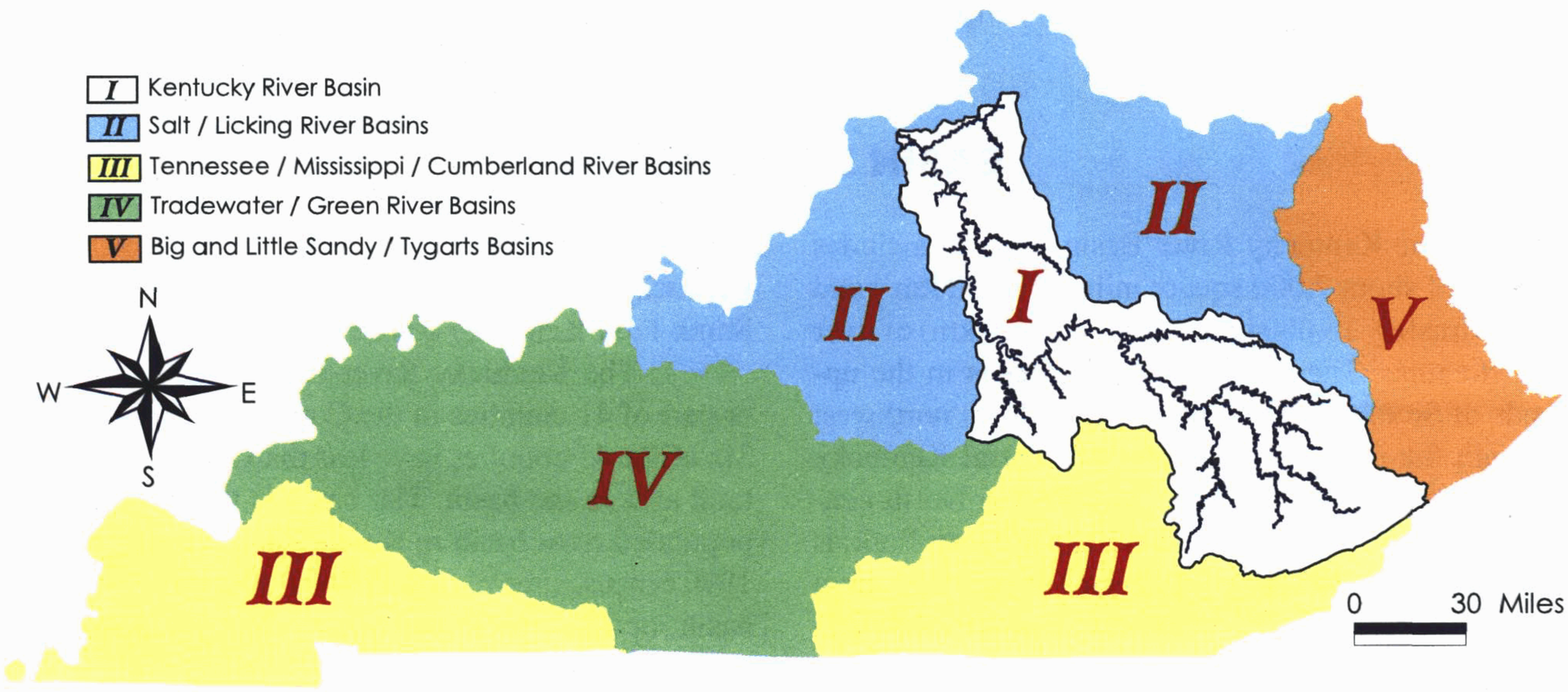


Figure 2: Kentucky Basin Management Units under the Kentucky Watershed Management Framework

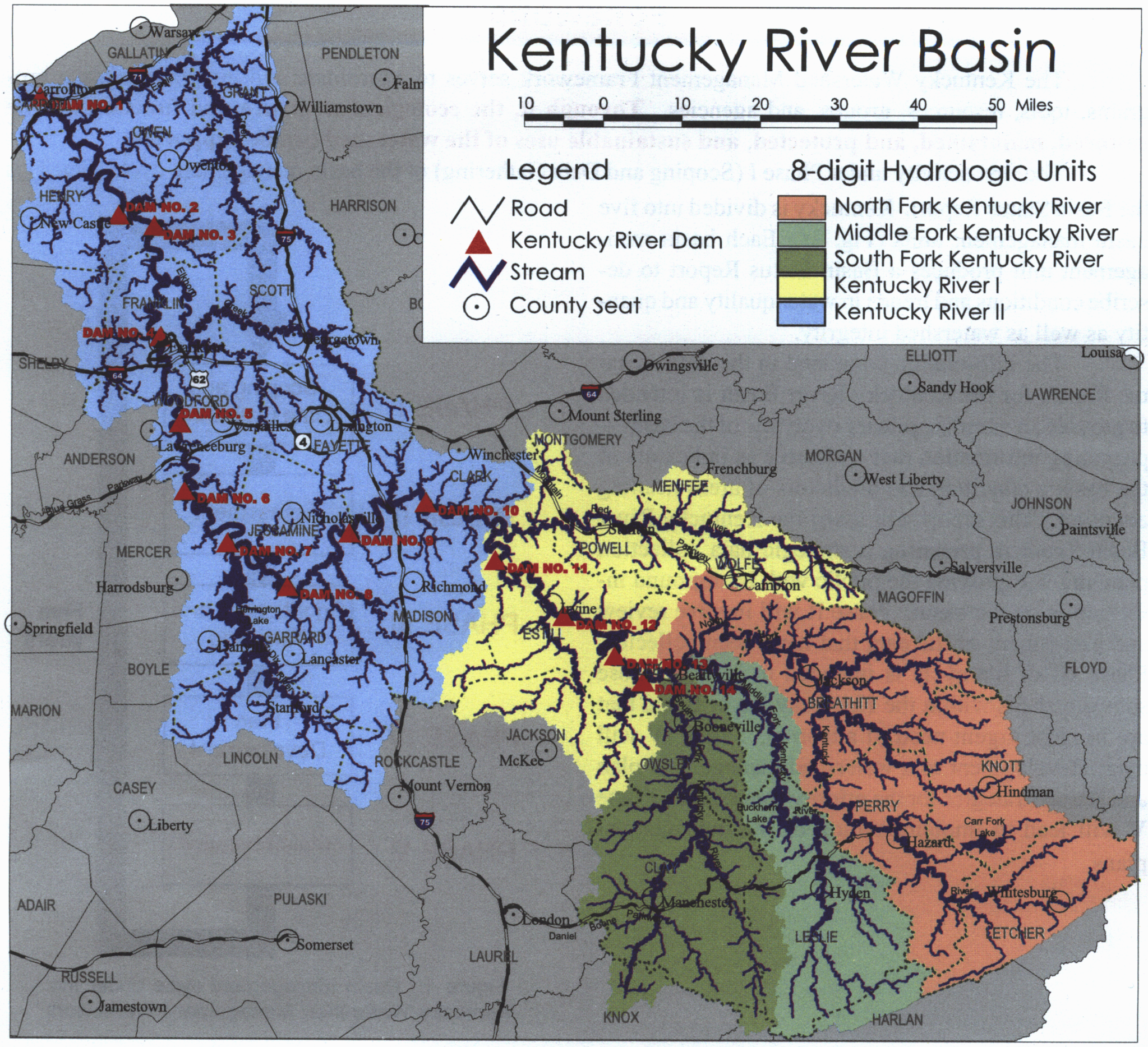


Figure 3: Kentucky River Basin

BASIN DESCRIPTION

The Kentucky River Basin (Fig. 3) includes an area of about 7,000 square miles (18,130 km^2) and approximately 16,000 linear miles (25,750 km) of river and streams. The river system originates in the uplands of Southeastern Kentucky and flows northwest through the rolling topography of Central Kentucky to join the Ohio River near Carrollton in North-central Kentucky. The river, including the North Fork, is approximately 405 miles (652 km) long. The main stem of the Kentucky River extends approximately 255 miles (410 km) through 14 locks and dams. Major tributaries to the Kentucky River include: Eagle Creek, Dix River, Elkhorn Creek, Red River, North Fork Kentucky River, Middle Fork Kentucky River, and the South Fork Kentucky River.

The Kentucky River Basin encompasses all or part of 41 counties in the Commonwealth (Fig. 3). Six of the 41 counties have less than 3 percent of their total area in the basin. The basin is the most densely populated river basin in Kentucky. According to the 1990 census, approximately 710,000 people live in the basin, or 101 people per square mile (39 people per km^2).

PHYSIOGRAPHY

Inner and Outer Bluegrass Region

The north-central portion of the Kentucky River Basin is located in the Inner Bluegrass region (Fig. 4). This region is characterized by karst topography, with numerous sinkholes and caves in limestone bedrock. The main stem of the Kentucky River has formed an incised meander in the Ordovician limestone that is highly susceptible to physical and chemical weathering resulting in scenic palisades. The Outer Bluegrass region has sections of interbedded shale and limestone. Elevation ranges from 800 to 1,000 feet above sea level, and the average slope of the main stem of the Kentucky River is approximately 0.7 feet per mile.

Knobs Region

The Knobs region (Fig. 4) is a narrow region separating the Bluegrass from the Eastern Kentucky Coal Field region. This region is characterized as having conical and flat-topped hills. The uppermost bedrock is comprised of sandy limestone, sandstone, and shale that overlie black shales and dolomite.

Appalachian Plateau and Cumberland Mountains Regions

The Appalachian Plateau and Cumberland Mountains regions (Fig. 4) are located in the southeastern part of the basin. The area is characterized by very steep-sided valleys and narrow ridges. Bedrock is dominated by sandstone, siltstone, shale, and interbedded coal strata. Elevation ranges from approximately 1,000 to 3,273 feet above sea level and the average slope of tributaries to the Kentucky River ranges from 3 to 7.2 feet per mile.

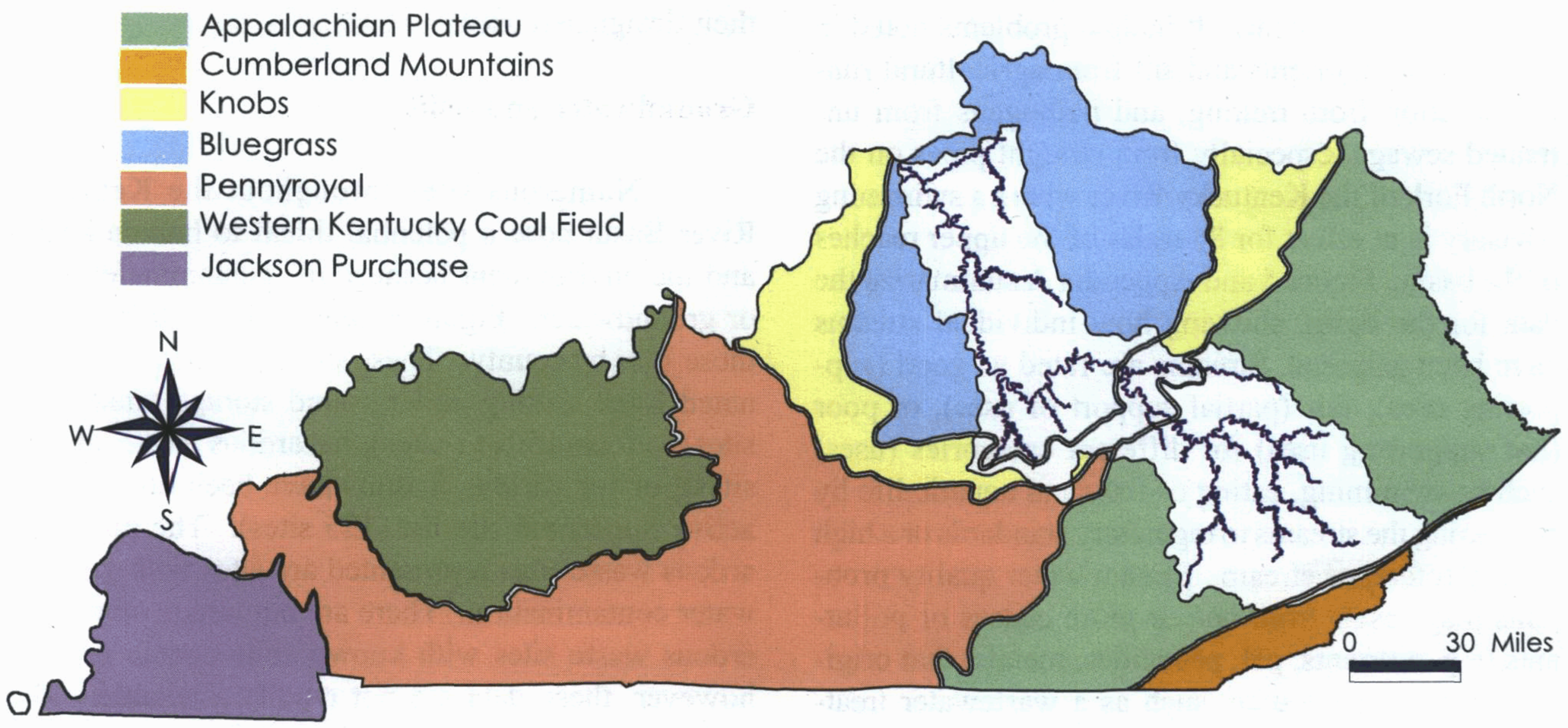


Figure 4: Physiographic Regions of Kentucky

WATERSHED QUALITY

OBSERVED CONDITION

Watershed quality can be measured directly or indirectly. On-site monitoring of water quality, water quantity, soils, biology, etc., gives direct information on the condition of the watershed and its potential for affecting human health. Various agencies and citizens' groups conduct environmental monitoring to assess the condition of natural resources relative to human and ecological health. The following represent field data that have been collected and assessed on groundwater, soils, surface water, and aquatic life.

Streams

The Kentucky Division of Water, in fulfillment of Section 305(b) of the Clean Water Act, assesses Kentucky's current water quality conditions every two years. The Division assessed 9,219 miles (14,837 km) of Kentucky's 49,100 miles (79,019 km) of streams (19 percent). Principal problems noted in the basin are nutrients and silt from agricultural runoff, siltation from mining, and pathogens from untreated sewage, especially from straight pipes on the North Fork of the Kentucky River where a swimming advisory is in effect for 86 miles of the upper reaches of the basin. Figure 5 and Appendix A summarize the data for the basin, showing how individual streams have been assessed. Streams are rated as good (supporting uses), fair (partial support of uses), or poor (not supporting uses) for different categories (uses) such as swimming, eating of fish, and aquatic life by comparing the streams to regulatory standards or a high quality reference stream. Stream water quality problems may result from one or more causes or pollutants (e.g. nutrients, pH, pesticides, metals) that originate from some source, such as a wastewater treatment plant, mining operation, industry, etc. Only those streams with problems were listed in the summary table. This list is intended only to provide overview information; the *Report to Congress on Water Quality* (or 305(b) Report) is recommended as the source for obtaining specific information on individual stream segments.

Reservoirs

The Kentucky River Basin has 15 reservoirs with a volume greater that 1,000 acre-feet or surface area greater than 100 acres. There are no natural lakes of significant size. The three largest reservoirs (Fig. 3) are as follows: Herrington (230,500 acre-feet), Buckhorn (21,800 acre-feet), and Carr Fork (6,480 acre-feet). These three reservoirs make up approximately 75 percent of the total reservoir surface area in the Kentucky River Basin. According to the 1996 Kentucky Report to Congress on Water Quality, Buckhorn and Carr Fork Lakes only partially support their designated use for secondary contact recreation (e.g. fishing and other partial body contact with the water) due to suspended solids from surface mining. The Stanford city reservoir partially supported its domestic water supply use due to nutrients from its watershed. Wilgreen Lake partially supported both aquatic life and secondary contact recreation uses due to nutrients from failing on-site disposal systems. All other assessed lakes were determined to fully support their designated uses.

Groundwater and Soils

Numerous sites throughout the Kentucky River Basin pose a potential threat to human health and the environment because of contaminated soils or groundwater. Figure 6 depicts the distribution of these sites by county. These sites have been contaminated from leaking underground storage tanks (379 sites), old landfills (2 sites), hazardous waste sites (9 sites), or for various reasons have been on the state active Superfund site list (125 sites). The nine hazardous waste sites represented are sites with groundwater contamination. There are numerous other hazardous waste sites with known soils contamination; however, these data are not readily available. The underground storage tanks sites represent sites with both groundwater and soil contamination. These represent a total of 515 contaminated sites in the counties of the Kentucky River Basin. Not surprisingly, the four counties with the highest number of contaminated sites are primarily urbanized or more highly developed – Fayette (146), Franklin (39), Madison (35), and Clark (24).

Kentucky River Basin

Waters Supporting Uses (Good)
Waters Partially Supporting Uses (Fair)
Waters Not Supporting Uses (Poor)
Unknown or Not Assessed

Little Eagle
Lee Branch
Town Branch
Baughman Fork
South Fork Red River
Hickman Creek
Boone Fork
Cane Creek
North Fork Kentucky River
Troublesome Creek
Lost Creek
Clear Creek
Maces Creek
Stratton Fork
Carr Fork
Bull Creek
Rockhouse Creek
Smoot Creek
Clarks Run
Neals Creek
Turkey Creek
Laurel Creek
Little Goose Creek
Crawfish Branch
Middle Fork Kentucky River
Wright Fork
Yonts Fork
Laurel Fork
Kings Creek

N
W
E
S

7 0 7 14 21 28 35 Miles

Figure 5

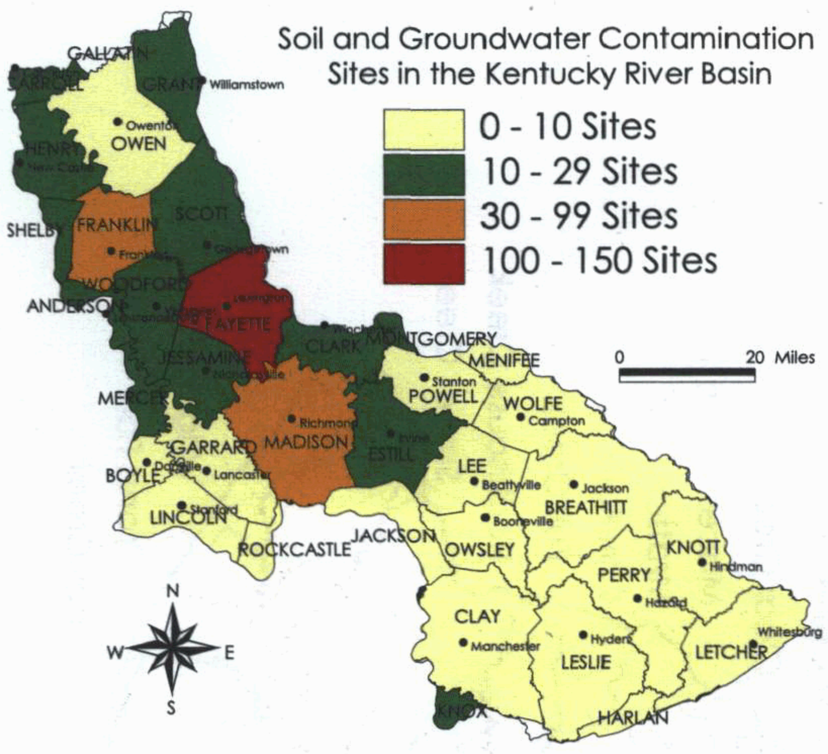


Figure 6: Soil and Groundwater Contamination Sites

Indicators of Condition

Given that only a very small percentage of the state has actually been monitored (7 percent) and assessed (19 percent) for surface water and even less for groundwater, it is important to have some means for assessing the condition of the rest of the watershed and targeting management efforts, e.g. Where should additional monitoring occur? What trends are occurring in the basin that could lead to problems in the future? What *potential* problems exist? Indicators of the basin's condition can provide a means for getting a sense of the condition of the basin, track improvements, and provide red flags for areas needing attention. The following represent some of the indicators currently available for a basin-wide assessment.

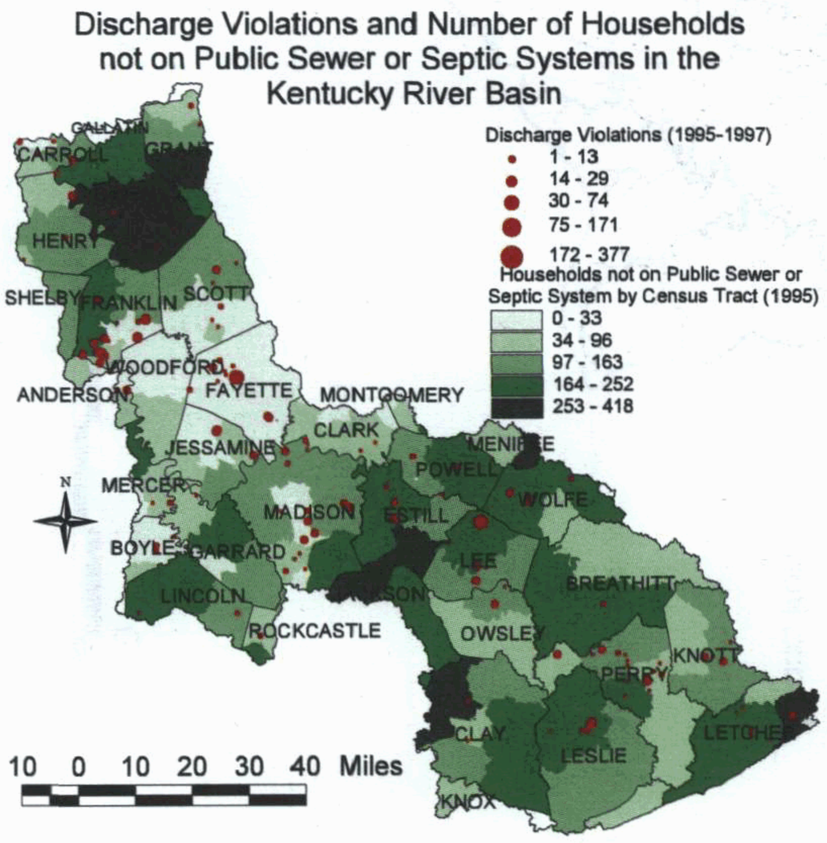


Figure 8: Discharge Violations and Number of Unsewered Households

Livestock Operations

Livestock production is a significant portion of the agricultural economy in Kentucky and a significant portion of the land use in some areas of the Kentucky River Basin. When these animals are found in high numbers or are confined for concentrated feeding operations, the high volumes of manure raise the potential for surface water runoff and groundwater contamination if proper management practices are not in place. Based upon data from the Kentucky Agricultural Statistics for 1996-1997, the total number of animals in the counties of the Kentucky River Basin is 704,800. This represents a total of 671,500 cattle and calves and 33,250 swine. Figure 7 illustrates the distribution of the total number of livestock per county.

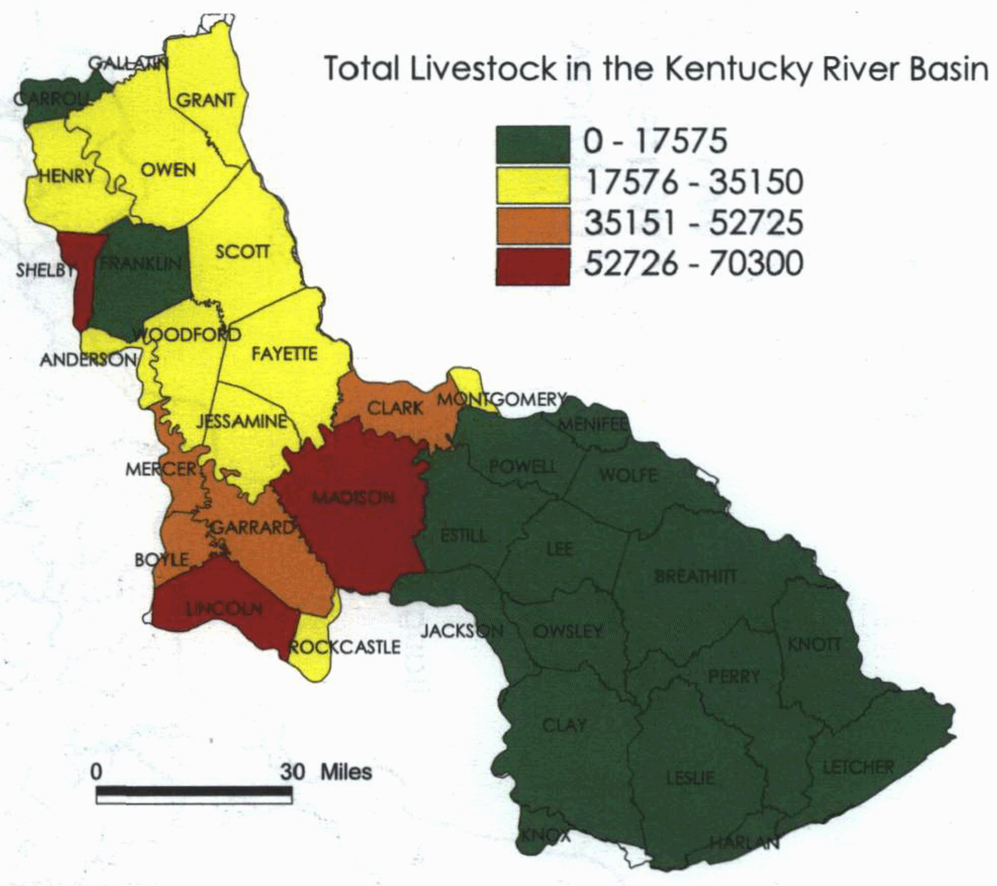


Figure 7: Number of Livestock

Discharge Violations & Unsewered Households

Figure 8 displays point source dischargers in the Kentucky River Basin by the number of violations between 1995 and 1997. These represent violations of permit limits for all types of KPDES-permitted dischargers. The same map depicts areas (1990 US Census data by census tract) by the number of unsewered households. Urban areas, obviously, have a smaller number of unsewered households.

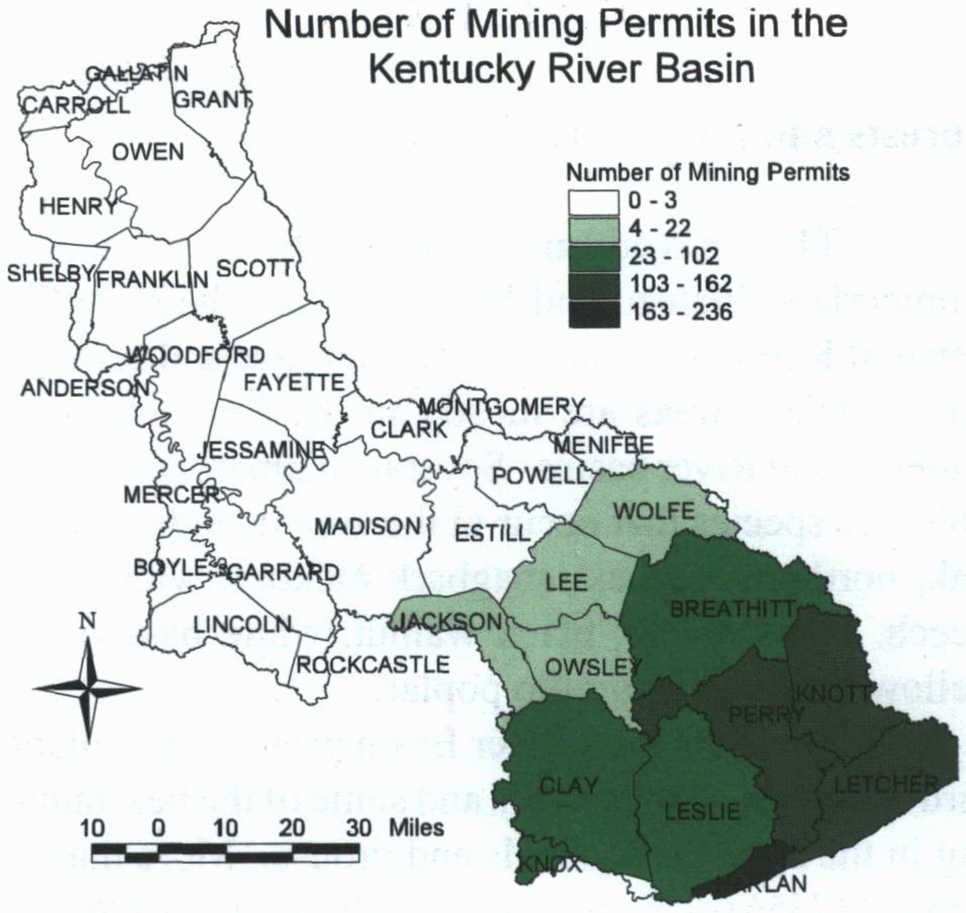


Figure 9: Mining Permits

Mining

Because coal mining involves major local changes to the earth's surface, ground and surface water quality and flow patterns can be greatly affected. Mining impacts more miles of streams than any other activity in the state. In the Kentucky River Basin, these activities occur only in the upper-most reaches of the basin, as shown by the number of coal mining permits in each county (Fig. 9). [Future basin status reports will utilize *acres* permitted for coal mining.]

Waste Management

The Division of Waste Management has several programs charged with identifying and managing waste sites. Because of the nature of various activities and the problems around which programs were created, indicators of *potential* soil or groundwater contamination differ from program to program. All active underground storage tanks (1,683), i.e. tanks that are currently receiving fuel and are operational, are considered a *potential* problem. Landfills that were closed by 1992 because they could not meet the new construction standards are the second indicator. That number has been estimated at one per county. The third indicator is treatment, storage, and disposal sites for hazardous waste. There were 23 of these facilities. In total, there were 1,740 sites in the basin (Fig. 10) that qualified as indicators of potential contamination. The four counties with the highest number of indicator sites were Fayette (214), Harlan (149), Madison (116), and Perry (100) counties.

Toxic Release Inventory

The Toxic Release Inventory (TRI) is an annual inventory of more than 300 toxic chemicals released to the environment. These data are reported as a relative risk score for their potential to harm humans and the environment and allow comparisons among the different chemicals and between counties. The risk score takes into account factors such as acute and

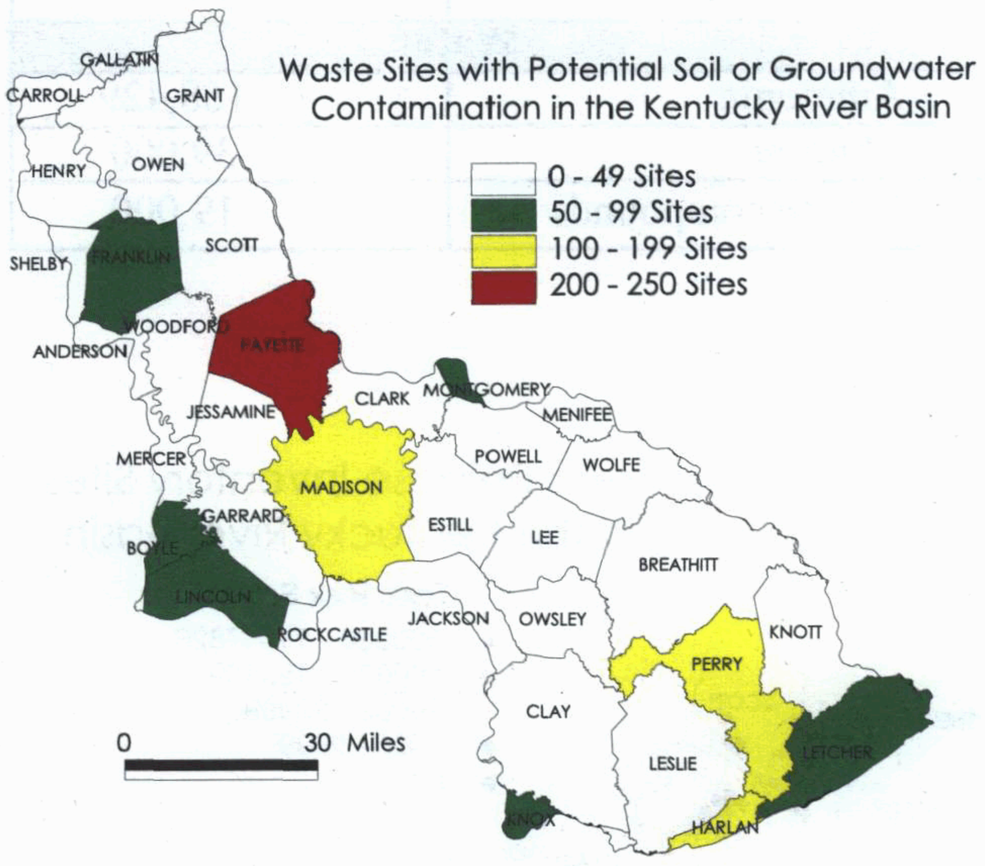
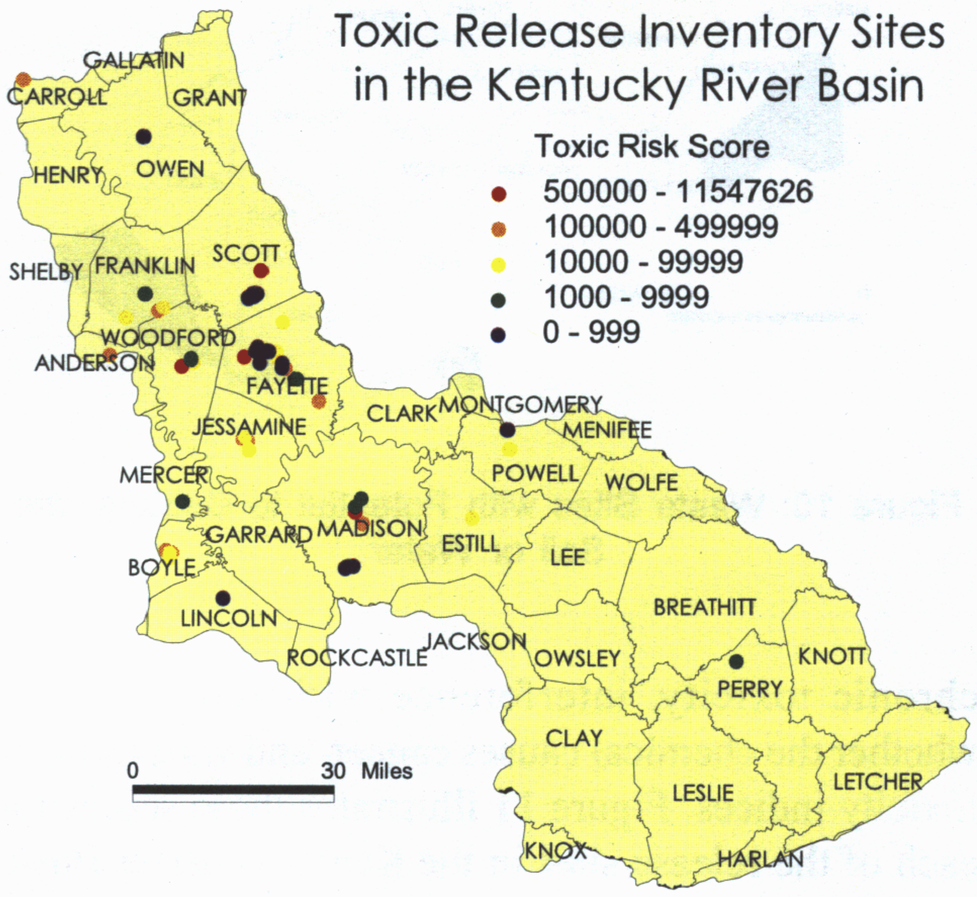


Figure 10: Waste Sites with Potential to Contaminate Soil or Water

chronic toxicity, interference with reproduction, whether the chemical causes cancer, and various other toxicity indices. Figure 11 illustrates these scores for each of the release sites in the Kentucky River Basin for 1994, the most recent year for which data are available. Higher scores indicate a greater release of toxic substances with a greater potential for toxic effects; lower scores indicate smaller quantities of chemicals released with a lesser potential for toxic effects. The five counties with the highest relative risk from toxic releases were Woodford (11,569,502), Scott (5,324,165), Madison (3,411,001), Fayette (2,210,945), and Jessamine (886,375), all of which are relatively urban or more highly developed counties. The three chemicals posing the highest relative risk are listed in Table 1, by land, air, and water.

Table 1: The three toxic chemicals released in the Kentucky River Basin (1994 data) in the greatest quantity and posing the greatest potential risk to human and ecological health

Chemical Name	Risk Score
Land	
Lead compounds	1,140,536
Zinc compounds	315,280
Lead	110,808
Air	
Xylene (mixed isomers)	11,155,072
Ethylbenzene	2,222,425
Methyl ethyl ketone	1,686,740
Water	
Ammonia	168,429
Chlorine	39,000
Nitrate compounds	19,000



Fiigure:11: Toxic Release Inventory Sites

BIODIVERSITY

Forests and Forest Life

The mixed mesophytic forests of the Cumberland Plateau and Mountains are the most diverse of Kentucky's natural communities and ecosystems. These areas are mostly in the Kentucky and Cumberland River basins. Several commercially valuable tree species that occur in the area include: white oak, northern red oak, shagbark hickory, white ash, beech, sugar maple, black walnut, white basswood, yellow buckeye, and tulip poplar.

The Kentucky River Basin provides excellent bird watching opportunities and some of the best hunting in the state for squirrels and grouse. More than 9 percent (7456) of Kentucky's deer harvest in 1996 and almost 11 percent (1785) of Kentucky's spring 1997 turkey harvest occurred in the Kentucky River Basin. Recent wildlife restoration projects in the area include the river otter and the peregrine falcon. Elk restoration is planned to begin in the winter of 1997-98. The black bear is becoming more common in Eastern Kentucky. Several federally listed endangered species of bats occur in the Basin, including the Indiana Bat, Gray Bat, and the Virginia Big-Eared Bat.

Life of Streams and Reservoirs

The Kentucky River Basin provides excellent opportunities for wildlife-related recreation. Kentucky's fish fauna is more diverse than that of all other states except Tennessee and Alabama. The Kentucky River has 115 native species (third richest fauna in the Commonwealth). The pools of the river support excellent warmwater fisheries featuring largemouth and spotted bass, crappie, bluegill and other sunfish, and catfish. Sauger and occasional walleye are also popular species below dams. Smallmouth bass and rock bass are prized sport fish in many of the streams. The basin has eight native muskellunge streams that receive supplemental stockings from the Kentucky Department of Fish and Wildlife Resources. Tributary watersheds to the Kentucky River have some of the Commonwealth's best streams for floating, fishing, and wading.

Herrington Lake (Fig. 3) supports some of the highest number of fishermen in the Commonwealth with its excellent largemouth bass, bluegill, and hybrid striped bass fisheries. Both Buckhorn and Carr Fork Lakes (Fig. 3) contain good largemouth bass,

bluegill, crappie, and catfish. Muskellunge are also stocked in Buckhorn Lake and walleye are stocked in Carr Fork Lake.

Freshwater mussels are bottom-dwelling organisms that inhabit many of Kentucky's streams and function as the "canaries of stream life," or early warning indicators of environmental stress. Kentucky has more species of mussels than any other state except Alabama and Tennessee. However, this group of organisms is the most endangered in Kentucky and the nation. Approximately 56 percent of the mussel species in Kentucky are found in the Kentucky River Basin. Some species have been severely impacted by pollution, physical alterations to streams, and siltation from mining, construction, and poor agricultural practices in the basin. It is also unsure what impact the zebra mussel, an introduced species, will have on native populations as this unwanted organism continues to migrate throughout the Kentucky River Basin causing significant threats to water intake structures.

Significant Lands and Wetlands

Examples of significant natural areas in the Kentucky River Basin include the Red River Gorge and Lilley Cornett Woods. The Red River Gorge is located in the Daniel Boone National Forest, in Powell, Wolfe, and Menifee Counties. It provides habitat for rare species, an impressive array of rare wildflowers, towering rock formations, natural bridges, and significant native American cultural sites. The upper portion of the Gorge is also classified as a National Wild and Scenic River. The Lilley Cornett Woods, located in Letcher County, provides the best example of old-growth, mixed mesophytic forest. It is the home of AppalachiaEcological Research Station of Eastern Kentucky University and has also been designated a Registered National Natural Landmark by the U.S. Department of Interior.

Wetlands provide essential watershed functions related to floodwater storage, groundwater flow moderation, sediment removal, nutrient cycling, and water purification. They provide diverse habitats for wildlife foraging and reproduction and essential habitat for a wide variety of mammals, reptiles, amphibians, and fish. Three broad categories of wetlands exist within the Kentucky River Basin. Lacustrine wetland systems include wetlands and deepwater habitats that are (1) situated in a depression or dammed river channel; (2) lacking trees, shrubs, emergent plants, emergent mosses or lichens with greater than 30 percent areal coverage; and (3) more than 20 acres. The second type is the palustrine system, which includes all wetlands dominated by trees, shrubs, emergent plants, and emergent mosses or lichens. This type of wetland includes: (1) wetlands lacking vegetation similar to lacustrine wetlands; (2) areas less than 20 acres with active wave-formed or bedrock shorelines with a water depth less than 2 meters, and 30 small, shallow, permanent or intermittent water bodies (ponds). The third type is the riverine system which occurs in floodplains and along streams, except those dominated by vegetation. Wetlands are characterized by other features as well, which help determine whether or not a wetland is regulated. For example, farm ponds do not qualify as regulated wetlands. A U.S. Fish and Wildlife analysis indicates that several general wetland types and acreage are present in the Kentucky River Basin (Figure 12). These wetlands were mapped during the mid- to late-1980's. It is important to note that a majority of this time period was considered to be unusually dry, and field verification has not been performed. Therefore, the acreage estimates could be substantially less than that actually present at the time of mapping.

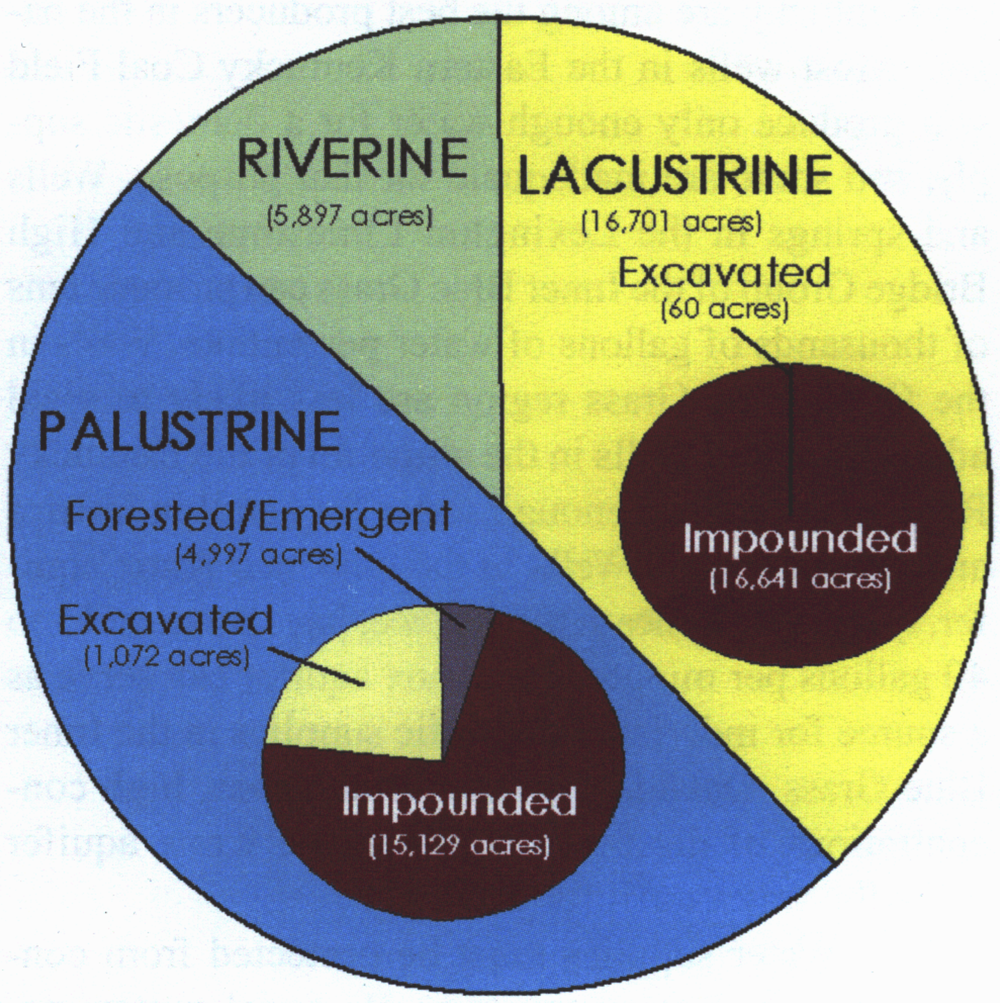


Figure 12: Wetlands in the Kentucky River Basin

WATER USE

More than 620,000 people living in the Kentucky River Basin rely on drinking water supplied by 68 public water systems that withdraw raw water directly from the Kentucky River, its tributaries, and reservoirs located in the basin. Surface water accounts for more than 95 percent of the public water supply.

Twenty-two of the 68 systems (32 percent) have an unaccounted for water loss greater than 25 percent. The largest water utilities and their number of active meter connections are as follows: Lexington (85,180), Frankfort (13,327), Winchester (9,221), Richmond (8,010), Georgetown (6,206), Nicholasville (6,204), Danville (6,060), and Hazard (6,000). Water uses include the following: domestic, agricultural, industrial, and thermo-electric power production.

Groundwater sources supply approximately 135,000 people living in the Kentucky River Basin. This is approximately 19 percent of the total Basin population and 36 percent of the rural Basin population. Eastern Kentucky residents rely heavily (50 percent) on this source of drinking water. Two-thirds of the residents, about 90,000 people, of the eastern, mountainous portion of the basin rely on groundwater. Wells in the Lee and Breathitt Formations of Eastern Kentucky are among the best producers in the basin. Most wells in the Eastern Kentucky Coal Field will produce only enough water for a domestic supply, and some are inadequate for that purpose. Wells and springs in the Lexington Limestone and High Bridge Group of the Inner Blue Grass can produce tens of thousands of gallons of water per minute. Wells in the Outer Blue Grass region are less likely to yield adequate water. Wells in the alluvium of the Kentucky River may produce enough water for small industries and communities. Wells in the confined Knox aquifer, lying deep beneath the surface, have produced 5 to 40 gallons per minute. The Knox aquifer can serve as a source for individual domestic supplies in the Inner Blue Grass. Outside the Inner Blue Grass, high concentrations of dissolved solids in the Knox aquifer make the water unfit for drinking.

Water supplies must be protected from contamination by human activities. Bacterial contamination is frequently a problem. Most water can be effectively treated, but many domestic systems do not achieve the level of treatment that is technically possible. Contamination of Inner Bluegrass karst aquifers can occur very quickly and in high concentrations due to rapid underground flow. Most of the precipitation that percolates to groundwater continues to move downward in the subsurface until it discharges back to the surface at springs, seeps, or directly into streams. The discharge of groundwater to the surface occurs continuously, and it is this discharge that sustains the flow of streams and rivers in the basin when rainfall is infrequent.

In order to better undrestand and protect their water supplies, all counties are required by state law to perform a county water supply plan by July, 1998. Kentucky also may be using money from the reauthorization of the Safe Drinking Water Act to help water utilities assess their water supplies and implement these plans. This planning process will include information on the adequacy of their supply, delineation of the immediate contributing watershed or wellhead, an inventory of potential contaminant sources, and plans to protect these watersheds from contamination or degradation. This information is collected in cooperation with and is made available to the public.

POPULATION AND LAND COVER

The most populous county in the Kentucky River Basin is Fayette County (Pop. 225,366), while the least populous is Owsley County (Pop. 5,036). The fastest growing counties are Grant (18.3 percent), Jessamine (17.1 percent), and Anderson (16.0 percent). Population is declining in Harlan (-12.7 percent), Letcher (-12.0 percent), and Owsley (-11.8 percent) counties. Major land covers in the Basin are: forest (58.0 percent), agricultural (37.1 percent), urban (3.6 percent), mining (1.2 percent), water (0.1 percent), and wetland (<0.1 percent). The predominant land cover changes at the Knobs physiographic region, from forest in the southeastern portion of the basin to agriculture in the Bluegrass physiographic region (Figure 13). The lower portion of the basin shows a mixed land cover of agriculture and forest.

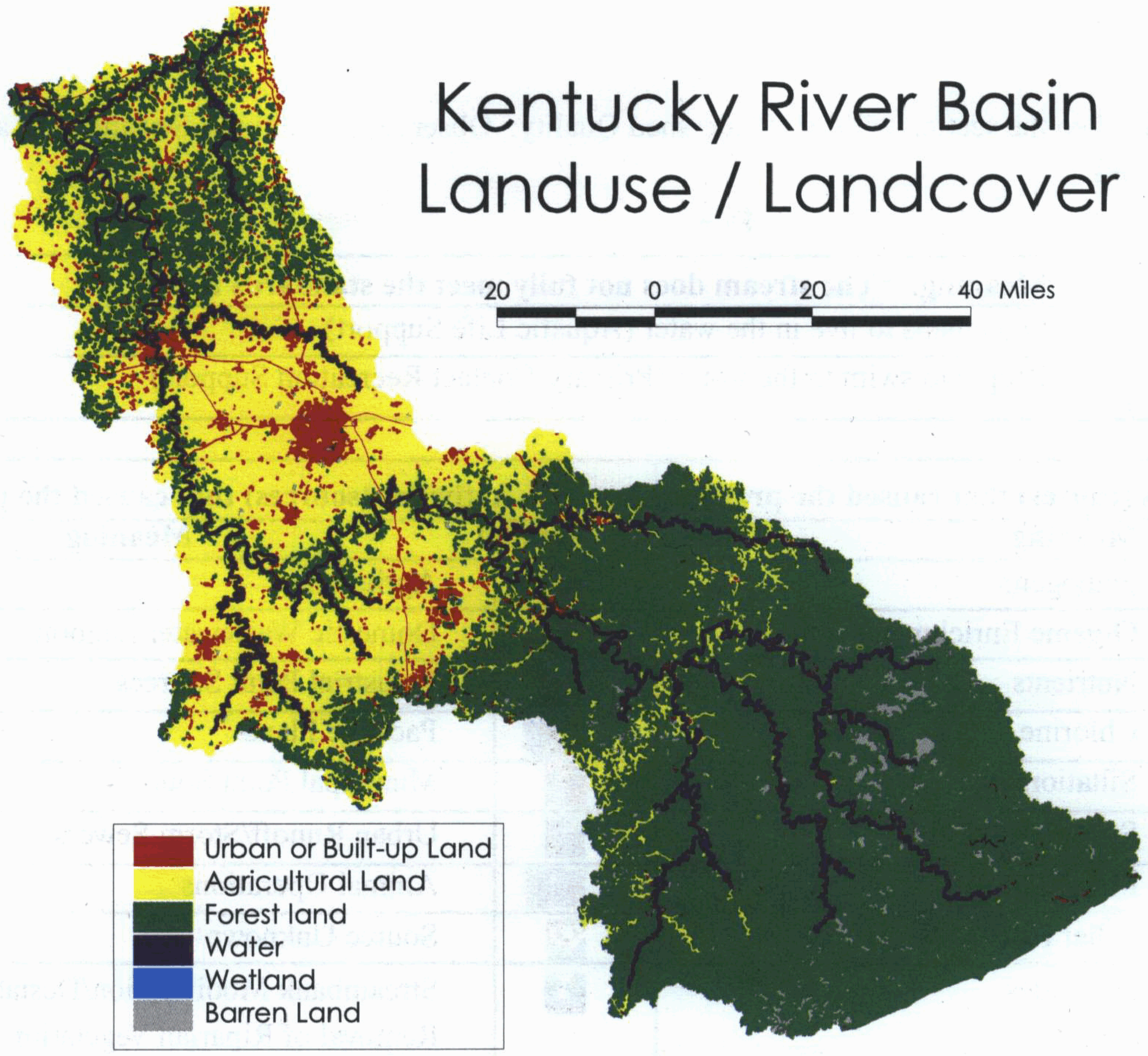


Figure 13: Major land cover categories of Kentucky River Basin (Anderson Level I)

PUBLIC INVOLVEMENT & PARTICIPATION

Kentucky River Watershed Watch

The Kentucky River Watershed Watch is a group of volunteer teams that assembled for a series of intensive sampling events throughout the Kentucky River Basin. For the initial assessments, teams visited sites on numerous tributaries of the Kentucky River and the main forks to assess habitat quality and collect water samples. Additionally, the teams have been out on other occasions to collect water samples for immunoassay analysis for certain pesticidesand numerous other water quality parameters. The habitat quality data and immunoassay data have been assembled in a computer mapping application by the Kentucky River Authority for viewing, analysis, and distribution. Public meetings will be held to discuss the data and issues relevant to the Kentucky River Basin.

Explanation of Data Analysis

All data have been collected for particular sites or stream segments where possible. In some cases, however, the data were only available by county. Where county data are presented, the numbers or summaries represent the information for the whole county, even though some of the county may actually lie outside the Kentucky River Basin.

Appendix A: 305(b) Report Summary

Legend: See the section entitled "Watershed Quality: Observed Conditions, Streams" for a discussion of these tables.

Symbol	Meaning: "The stream does not fully meet the standards for…"
	Organisms to live in the water (Aquatic Life Support)
	People to swim in the water (Primary Contact Recreation Support)

Pollutants (causes) that caused the problem		Activities (sources) that caused the problem	
Symbol	**Meaning**	**Symbol**	**Meaning**
	Pathogens		Agriculture
	Organic Enrichment/ Low DO		Domestic Wastewater Lagoon
	Nutrients		Industrial Point Sources
	Chlorine		Package Plants
	Siltation		Municipal Point Sources
	Suspended Solids		Urban Runoff/Storm Sewers
	Metals		Animal Operations
	Other Habitat Alterations		Source Unknown
	Pesticides		Streambank Modification/Destabilization Removal of Riparian Vegetation Habitat Modification
	pH		On-Site Wastewater System (Septic Systems)
	Oil and Grease		Silviculture
	Unionized Ammonia		Combined Sewer Overflow
	Salinity/TDS/Chlorides		Petroleum Activities
	Unknown Toxicity		Resource Extraction
			Water Treatment Plants
			Hydromodification
			Construction
			Land Disposal

305(b) Assessments by County: The following table summarizes streams that did not fully meet the standards for swimming and organisms living in the water. To view segments that fully met the standards see Figure 5. For more specific information on where the assessments occurred and the degree to which the streams were impacted see the *Kentucky Report to Congress on Water Quality* (1996).

Stream	The stream failed to fully meet the standards for	Pollutants (causes) that caused the problem	Activities (sources) that caused the problem
Anderson County			
Kentucky River			
Boyle County			
Clarks Run			
Breathitt County			
Boone Fork			
Cane Creek			
Lost Creek			
Middle Fork Ky. River			
North Fork Ky. River			
Troublesome Creek			
Carroll County			
Eagle Creek			
Clark County			
Four Mile Creek		HA	
Clay County			
Crawfish Branch			
Laurel Creek			
Little Goose Creek			
Red Bird River			
South Fork Ky. River			
Estill County			
Drowning Creek			
Kentucky River			
Fayette County			
Braughman Fork			
Cane Run			
South Elkhorn Creek			
Town Branch			
Franklin County			
Kentucky River			
Gallatin County			
Eagle Creek			
Garrard County			
Copper Creek			
Dix River			

Stream	The stream failed to fully meet the standards for	Pollutants (causes) that caused the problem	Activities (sources) that caused the problem
Kentucky River			
Grant County			
Eagle Creek			
Harlan County			
Greasy Creek of Middle Fork Ky. River		SS HA	
Jessamine County			
Hickman Creek		HA	
Kentucky River			
Knott County			
Carr Fork			
Clear Creek			
Troublesome Creek			
Lee County			
Jerushia Branch		SS HA	
Middle Fork Ky. River		SS	
North Fork Ky. River			
Leslie County			
Beech Fork		SS HA	
Cutshin Creek		SS	
Greasy Creek of Middle Fork Ky. River		SS HA	
Middle Fork Ky. River		SS	
Red Bird River		SS HA	
Letcher County			
Kings Creek			
North Fork Ky. River			
Rockhouse Creek			
Smoot Creek			
Turkey Creek			
Wright Fork			
Younts Fork			
Lincoln County			
Copper Creek			
Dix River			
Neals Creek		SS	
Madison County			
Drowning Creek			
Kentucky River			

Stream	The stream failed to fully meet the standards for	Pollutants (causes) that caused the problem	Activities (sources) that caused the problem
Menifee County			
Red River			
Mercer County			
Kentucky River			
Owen County			
Eagle Creek			
Owsley County			
Jerushia Branch			
South Fork Ky. River			
Perry County			
Bull Creek			
Carr Fork			
Leatherwood Creek			
Lost Creek			
Maces Creek			
Middle Fork Ky. River			
North Fork Ky. River			
Statton Fork			
Troublesome Creek			
Powell County			
Red River			
Sand Lick Fork			
South Fork Red River			
Rockcastle County			
Copper Creek			
Scott County			
Cane Run			
Dry Run			
Lanes Run			
Little Eagle Creek			
South Elkhorn Creek			
Wolfe County			
Red River			
Woodford County			
Kentucky River			
Lee Branch			
South Elkhorn Creek			

KENTUCKY RIVER FACT SHEET

Geography and Demography

- The Kentucky River basin drains an area of some 7,000 square miles and includes all or parts of 41 counties.
- The river flows from the mountains of southeastern Kentucky northwestward through the rolling topography of Central Kentucky to join the Ohio River near Carrollton in North-central Kentucky. The river, including the North Fork, is about 405 miles long.
- There are some 16,000 miles of river and streams in the basin.
- About 710,000 people live in the basin; 131,000 in the headwaters.

Water Supply

- An average of 46 inches of precipitation (5.6 trillion gallons) falls on the basin every year. About 18 inches (2.2 trillion gallons) runs off in streams and 28 inches (3.4 trillion gallons) evaporates or is transpired by plants.
- The annual average flow in the Kentucky River at Lock 10 near Lexington is about 3.5 billion gallons per day (5,550 cubic feet per second).
- There are 68 public water systems in the Kentucky River Basin.
- 135,000 residents in the basin rely on private supplies; wells, hauled water, cisterns, and other sources.
- There are nearly 40,000 private wells in the basin, of which nearly 34,000 are in the headwaters region.
- Five of eight people in the headwaters rely on wells for their water.
- More than 90 percent of the residential, commercial, and industrial water use is provided by surface water supplies.

Water Quality

- Surface and groundwater supplies in the basin are susceptible to pollution from both natural and manmade sources. Naturally occurring substances such as iron, manganese, barium, fluoride, hydrogen sulfide and salt may be present in objectionable levels. Bacteria from sewage, septic tanks, and animal wastes are a common problem. Some water supplies in the basin have been threatened by organic chemicals, including volatile organic chemicals (VOCs) and trihalomethanes (THMs).
- Approximately half of the assessed streams in the basin had problems (did not fully support their designated uses for aquatic life and swimming).
- About one-half of all private wells tested each year are contaminated with fecal coliform.
- There are 460 permitted effluent discharge sites in the basin.
- There are 37 permitted solid waste disposal sites in the basin. The number and location of abandoned dumps is uncertain.
- There are 684 permitted hazardous waste producers in the basin.
- There are about 7,000 underground storage tanks in the basin. It has been estimated that 25 percent of these tanks leak.
- Four out of five households in the headwaters are not on public sewer.

For further information or additional copies of this report, contact the Kentucky River Authority at (502) 564-2866 or the Kentucky Division of Water at (502) 564-3410 or check these sites on the World Wide Web: **http://water.nr.state.ky.us/dow/watrshd.htm** or **http://www.state.ky.us/agencies/nrepc/kra/page1.htm**

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