

PART 2: FOREST PRIORITY AREAS

A. Introduction

The Food, Conservation, and Energy Act of 2008 requires that all states evaluate their forest resources, identify any areas or regions of the state that are a priority, and develop strategies for addressing forestland issues. Part 1 of this document evaluated the forest resources according to the five most important forestland issues for Kentuckians. This second part of the *Kentucky Statewide Assessment of Forest Resources* seeks to satisfy the second requirement of the Food, Conservation, and Energy Act of 2008 – identification of priority areas.

The goal of identifying priority areas is to allow the programs within the Kentucky Division of Forestry (KDF) and external partners and agencies, to focus implementation efforts for forest issues towards areas where the need is the greatest. Forests exist in every county of Kentucky, but these forests are not necessarily priority forests. Defining the geographic extent of priority areas is not intended to restrict the implementation of strategies in non-priority forest areas. Rather, priority areas identify the most important regions for particular forest issues and the strategies that address these issues.

B. Priority Area Identification Method and Data Sources

National guidance suggested two approaches to identifying forest priority areas. In the combined issue priority area approach, geographic layers associated with forestland issues are overlaid in order to identify areas where multiple issues occur. In this approach, no issue is weighted as more important than any other issue. Alternatively, in a comprehensive modeling approach, each geographic layer is assigned a weight based on benefits and threats. Priority areas identified in this method are areas that score the highest when multiple issues overlap. Because Kentucky's assessment focused on forest issues and because the perspectives of best use and value are diverse in the state, the Kentucky Statewide Forest Resources Assessment Team decided to utilize a combined issue priority approach.

Once the approach was determined, a group of experts from Kentucky natural resource agencies was assembled for a Forest Priority Area Scoping Meeting to collaboratively determine the geographic limits of the priority areas. On January 11, 2010, expert representatives from the Kentucky Division of Forestry (KDF), Kentucky Division of Conservation, Kentucky Department of Fish and Wildlife Resources, US Fish and Wildlife Service, US Forest Service's (USFS) Land Between the Lakes National Recreation Area and Daniel Boone National Forest, Natural Resource Conservation Service (NRCS), Kentucky Division of Water, Kentucky Natural Lands Trust, and the Kentucky State Nature Preserves Commission jointly reviewed geographic layers and determined priority areas.

During the Scoping Meeting, the following data sources were reviewed in determining priority areas:

- Kentucky Wildlife Action Plan Forestland Bird Conservation Areas¹⁵¹
- Large Forest Blocks of Kentucky^{152,153}
- Level IV Ecoregions of Kentucky¹⁵⁴
- HUC-8 Watersheds of Kentucky
- Mississippi River Basin Healthy Watersheds Initiative Maps¹⁵⁵
- County Boundaries
- Current Hemlock Woolly Adelgid Distribution
- Current Emerald Ash Borer Distribution

- Wildfire and Arson Fires Responded to by the KDF from 2004 to 2009
- Protected Forest Areas of Kentucky¹⁵⁶
- Wildland-Urban Interface

Seven Forest Priority Areas were identified as a result of this process, as shown in Figure 42. These priority areas were hand digitized based on overlapping interests in given geographic area. The relationship between these priority areas and the large forested blocks, watersheds, ecoregions, forestland bird conservation areas, and the wildland-urban interface are shown in Figures 43-47. From east to west, the seven forest priority areas are as follows:

1. Appalachian Forest Priority Area,
2. Bluegrass Rivers Forest Priority Area,
3. Headwaters Forest Priority Area,
4. Cumberland Forest Priority Area,
5. Central Corridor Forest Priority Area,
6. Pennyroyal Forest Priority Area, and
7. Big Rivers Forest Priority Area.

The priority area identification process began with the large forest tracts, as shown in Figure 42. The large forest tracts are areas of 1,000 acres or more of contiguous forest throughout the state. Forest cover is based on the National Land Cover Dataset 2001 data (deciduous forest, evergreen forest, mixed forest, and forested wetland) for consistency between adjacent states. Forest tracts were modeled using Kentucky, Tennessee, and Virginia data so that large tracts of forest crossing the state boundary would be identified. Road, railroad, and utility line (KY only) data was used to further assist in identifying fragmentation. A series of grid processing steps (shrink, expand, path allocation modeling, etc.) were used to identify forest blocks. Although numerous other smaller forested areas are present throughout Kentucky, only tracts greater than 900 acres in size (instead of 1000 acres to allow for inaccuracies in the dataset) are shown in Figure 43.

Because of the key relationship between forests and water quality and quantity, Figure 44 shows forest priority areas and watersheds. A watershed is the land area in which all the water drains into a specific stream, creek, or river. The sub-basin watershed size (eight-digit Hydrologic Unit Code, HUC-8) was chosen for analysis in the priority area identification process because of management considerations. All selected priority areas have several impaired waters, special use waters, and permitted water withdrawals within them.

Figure 45 shows the relationship between ecoregions and the forest priority areas. Ecoregions identify areas of general similarity in type, quality, and quantity of environmental resources. According to the US Environmental Protection Agency¹⁵⁴, there are 25 level IV ecoregions in Kentucky which are strongly related to regional physiographic, geologic, land use and soil characteristics. These ecoregions intended to guide “ecosystem management strategies across federal agencies, state agencies, and nongovernment organizations that are responsible for different types of resources in the same geographic areas.” Because of these characteristics of ecoregions, forest priority areas often generally follow ecoregion boundaries.

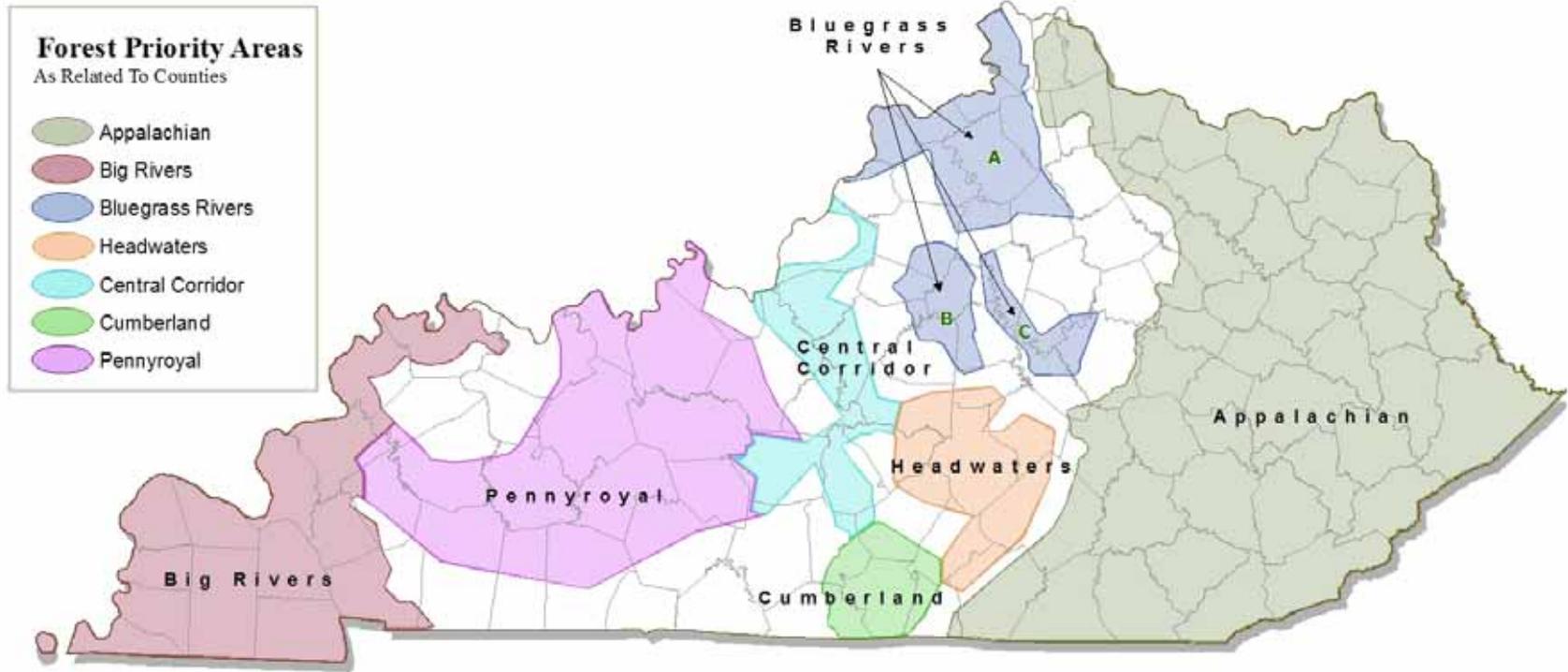


FIGURE 42 – KENTUCKY FOREST PRIORITY AREAS

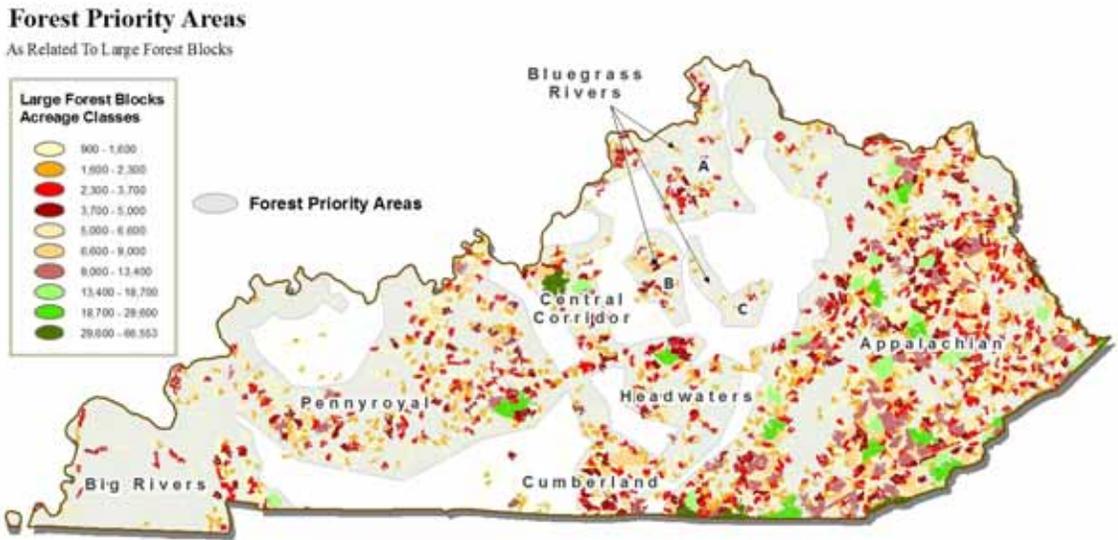


FIGURE 43 – KENTUCKY FOREST PRIORITY AREAS AND LARGE FOREST BLOCKS

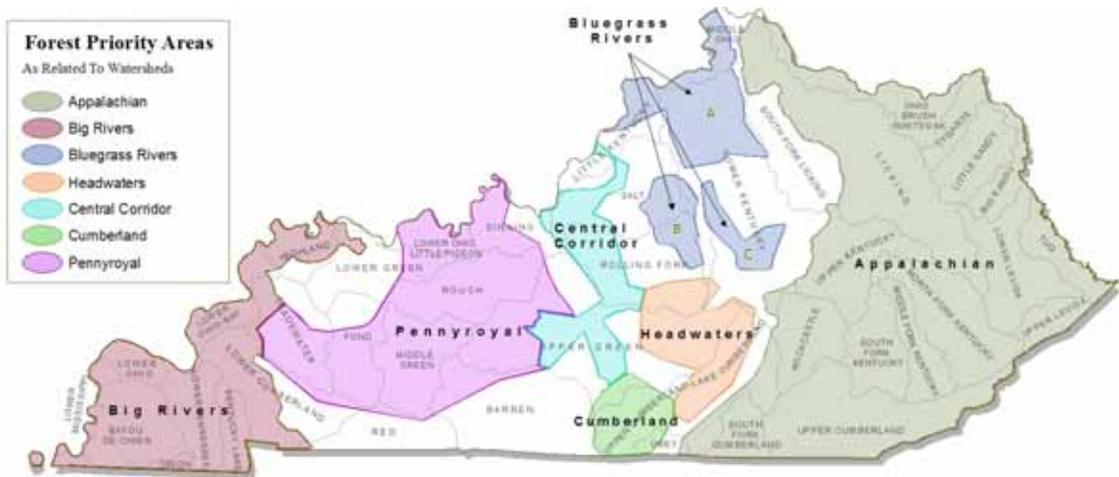


FIGURE 44 – KENTUCKY FOREST PRIORITY AREAS AND WATERSHEDS

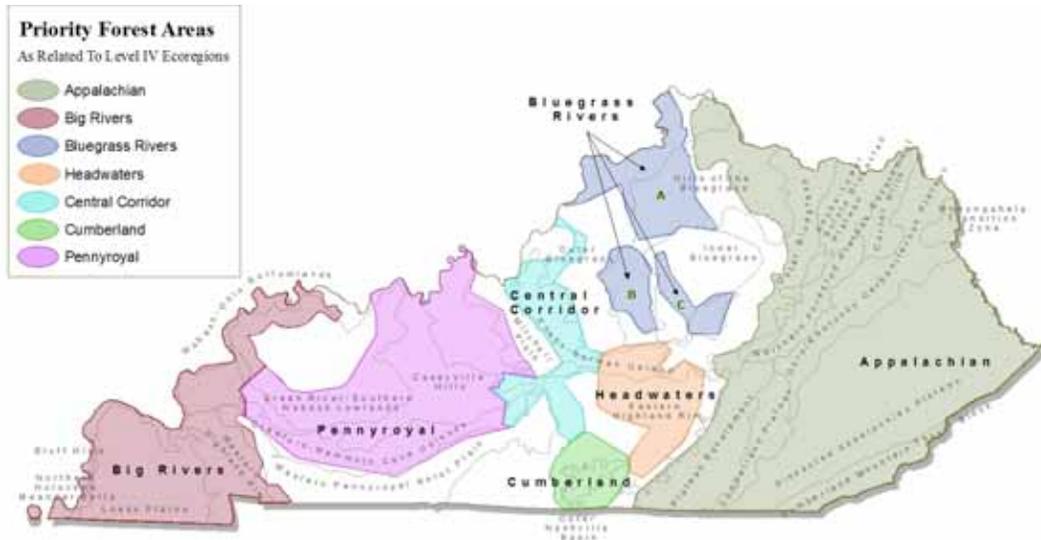
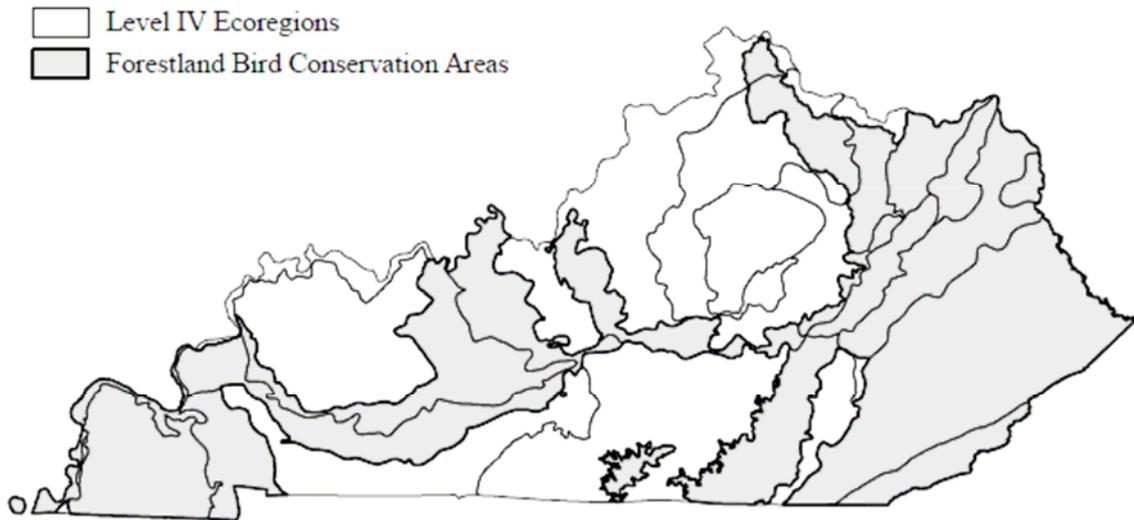


FIGURE 45 – KENTUCKY FOREST PRIORITY AREAS AND LEVEL IV ECOREGIONS

The Forestland Bird Conservation Areas are shown in Figure 46. The Forestland Bird Conservation Areas were identified in the Kentucky Wildlife Action Plan and provide the best indicator of forest areas that are important for wildlife habitat. Although numerous non-bird species utilize forest habitats, the Wildlife Action Plan specifically linked the seventeen bird species, including the American woodcock, cerulean warbler, sharp-shinned hawk, and Swainson’s warbler, to forest habitat. These forest areas were chosen as most important for those species.



(Source: KDFWR)

FIGURE 46 – KENTUCKY FORESTLAND BIRD CONSERVATION AREAS

The Wildland-Urban Interface (WUI) is the area in which residences border or are intermixed with undeveloped wildland vegetation. WUI areas are important because of the increased likelihood of forest decline or loss due to wildland fires, habitat fragmentation, invasive species, and other threats in these areas. Figure 47 shows two types of WUI in Kentucky based on 2000 US Census data and the National

Landcover Dataset of 2001. Intermix WUI are areas a housing density of at least one per 40 acres intermingles with more than 50 percent continuous wildland vegetation. Interface WUI are areas with the same housing density and less than 50 percent contiguous wildland vegetation, but within 1.5 miles of an area of over 1325 acres that is more than 75 percent vegetated.¹⁵⁷

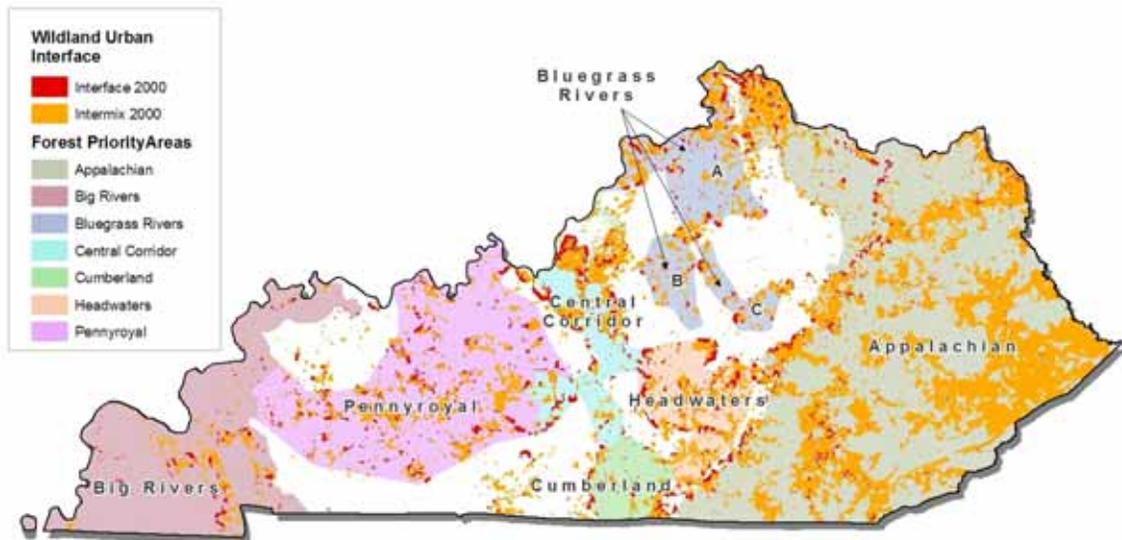


FIGURE 47 – KENTUCKY WILDLAND-URBAN INTERFACE AND PRIORITY AREAS

For each of the seven priority areas identified in Kentucky, a brief description of the priority area location and a list of the relevant forest issues in each specific area are provided below.

1. Appalachian Forest Priority Area

The Appalachian Forest Priority Area covers the most abundant forest resources in eastern Kentucky. To the west, it follows the western borders of the Licking River and Upper Kentucky watersheds and the Plateau Escarpment ecoregion. The following forest issues are key in this area.

- *Forest Health*
 - Hemlock Woolly Adelgid
 - Emerald Ash Borer
 - Gypsy moth
 - Chestnut blight
 - Wildland fire
 - Fire communities at risk
 - Large numbers of threatened and endangered species, particularly Indiana bats
 - High concentration of mining
- *Water Quality and Quantity*
 - Numerous designated special use waters
 - Mississippi River Basin Initiative’s Licking River watershed
- *Fragmentation and Loss*
 - Large forest blocks
 - Licking River and Cumberland/Pine Mountain Forest Legacy Conservation Areas
 - Connectivity of wildlife habitats such as elk and bear

- *Forest Management*
 - Federal forests land including the Daniel Boone National Forest, Jefferson National Forest, Big South Fork National Recreation Area, and Cumberland Gap National Historical Park
 - Numerous state-owned forests including state forests, wildlife management areas (WMAs), nature preserves, and state parks
 - Low number of Forest Stewardship Plans
 - Interior forest habitat for non-game migratory birds
 - Activity of the Appalachian Regional Reforestation Initiative
 - High rate of timber theft
 - Forest industries
 - Recreational pressures

2. *Bluegrass Rivers Forest Priority Area*

The Bluegrass Rivers Forest Priority Areas includes three areas in north central Kentucky. The largest area (Area A) incorporates the large forested tracts along the Ohio River border near the mouth of the Kentucky River and Little Kentucky River. The second area (Area B) follows the few remaining large forest blocks along the ecologically important Kentucky River corridor in the Interior Bluegrass Region. The third area (Area C) includes the large forested blocks in the Salt and Rolling Fork watersheds. The following forest issues are key in this area.

- *Forest Health*
 - High concentrations of exotic, invasive plants
 - Emerald Ash Borer threat to the largest concentration of ash trees in Kentucky
 - Numerous threatened and endangered species, particularly along the Kentucky River corridor
 - Air quality
- *Water Quality and Quantity*
 - Water quantity in high demand area
 - Forested riparian zones
- *Fragmentation and Loss*
 - Highly impacted by forest loss and fragmentation
 - Remaining large forest blocks in Bluegrass Physiographic Region
 - Kentucky River Palisade Legacy Area corridor
 - Urban development pressures
- *Forest Management*
 - Important role of urban forestry
 - Rare river cliff habitat

3. *Headwaters Forest Priority Area*

The Headwaters Forest Priority Area derives its name from its location in the headwater regions of the Rolling Fork, Upper Cumberland, and Upper Green watersheds. The area includes forests in the Knobs-Norman Upland and Eastern Highland Rim ecoregions. The following forest issues are key in this area.

- *Forest Health*
 - Threat and impact of exotic, invasive plants
- *Water Quality and Quantity*
 - Water quality

- Threatened and endangered species in the upper Green River
- *Fragmentation and Loss*
 - Large forest blocks
- *Forest Management*
 - Green River Conservation Reserve Enhancement Program (CREP)
 - Forest industries

4. *Cumberland Forest Priority Area*

The Cumberland Forest Priority Area covers the large forest blocks in the Lake Cumberland-Cumberland River area and includes Cumberland County and portions of each of the surrounding counties. It is in the Lower Nashville Basin ecoregion. The following forest issues are key in this area.

- *Forest Health*
 - Exotic and invasive species
 - Threatened and endangered species
- *Water Quality and Quantity*
 - Water quality
- *Fragmentation and Loss*
 - A portion of the Central Corridor Legacy Conservation Area
 - Large forest block
 - Pressures of development and recreation
- *Forest Management*
 - Migratory, non-game bird corridor
 - Forest industries
 - Fire in the wildland-urban interface

5. *Central Corridor Forest Priority Area*

The Central Corridor Forest Priority Area is primarily located with the Knobs-Norman Upland ecoregion but also extends to the north around the border of Jefferson County, to the south towards the Cumberland Forest Priority Area, and to the west towards Mammoth Cave. The following forest issues are key in this area.

- *Forest Health*
 - Exotic, invasive species
 - Air quality
- *Water Quality and Quantity*
 - Water quality in karst
- *Fragmentation and Loss*
 - Wildlife connectivity
 - Pressures of urban development causing fragmentation and loss
 - Large forest blocks
 - A portion of the Central Corridor Legacy Conservation Area
- *Forest Management*
 - Fort Knox Military Reservation and other public lands
 - Threatened and endangered species management

6. *Pennyroyal Forest Priority Area*

The Pennyroyal Forest Priority Area is located in western portion of Kentucky. It connects the Big Rivers Forest Priority Area in the west with the Central Corridor Forest Priority Area in the east. The southern extent encompasses much of the Crawford-Mammoth Cave Uplands ecoregion while to the north it borders the Ohio River from Daviess County to Meade County. The following forest issues are key in this area.

- *Forest Health*
 - Concentration of mining
 - Assorted forest health threats
 - Threatened and endangered species
- *Water Quality and Quantity*
 - Designated special use waters
 - Water Quality in karst
 - Portion of the Mississippi River Basin Initiative's Lower Green Watershed
- *Fragmentation and Loss*
 - Large forest blocks
 - Concentration of agriculture
- *Forest Management*
 - Timber harvesting pressures
 - Forest industries
 - Expanded Green River CREP
 - Public lands including the Mammoth Cave National Park, Pennyryle State Forest, Peabody WMA, and Tradewater WMA

7. *Big Rivers Forest Priority Area*

The Big Rivers Forest Priority Area is so called due to the presence of the Mississippi, Ohio, Tennessee, Green, Tradewater, and Cumberland Rivers in this region. This area includes the large forested blocks in the Western Highland Rim ecoregion and extends to the northeast along the Ohio River into Union and Henderson Counties. The following forest issues are key in this area.

- *Forest Health*
 - Threatened and endangered species including bats and bottomland species
 - Potential Emerald Ash Borer impacts
- *Water Quality and Quantity*
 - Forested wetlands
 - Two Mississippi River Basin Initiative key watersheds: Bayou de Chien and Obion Creek
- *Fragmentation and Loss*
 - Large block of forests
 - Contains the Big Rivers Corridor Legacy Area
- *Forest Management*
 - Mississippi River migratory bird flyway
 - Numerous protected federal and state lands including recreation areas, wildlife refuges, and wildlife management areas
 - Forest industries
 - Opportunity for agroforestry due to high concentration of agriculture
 - Priority area for NRCS tree planting
 - Recreational pressures on forests

C. Forest Legacy Areas

The Forest Legacy Areas (FLAs) were identified as subsets within the larger priority areas to provide a comprehensive identification of key forest resources in Kentucky. The FLAs were first developed in conjunction with the Forest Legacy Assessment of Need in 2003 to identify environmentally important forests for protection from conversion to non-forest uses. Originally, these legacy priority areas included about 80% of the state, but they were narrowed and renamed in 2010 based on rare species abundance, threats to conversion, and connectivity to existing protected lands. The five Forest Legacy Areas, including the Big Rivers Corridor, Central Corridor, Kentucky River Palisades, and the Licking River Corridor, and the Cumberland / Pine Mountain Conservation Area, are shown in Figure 48.

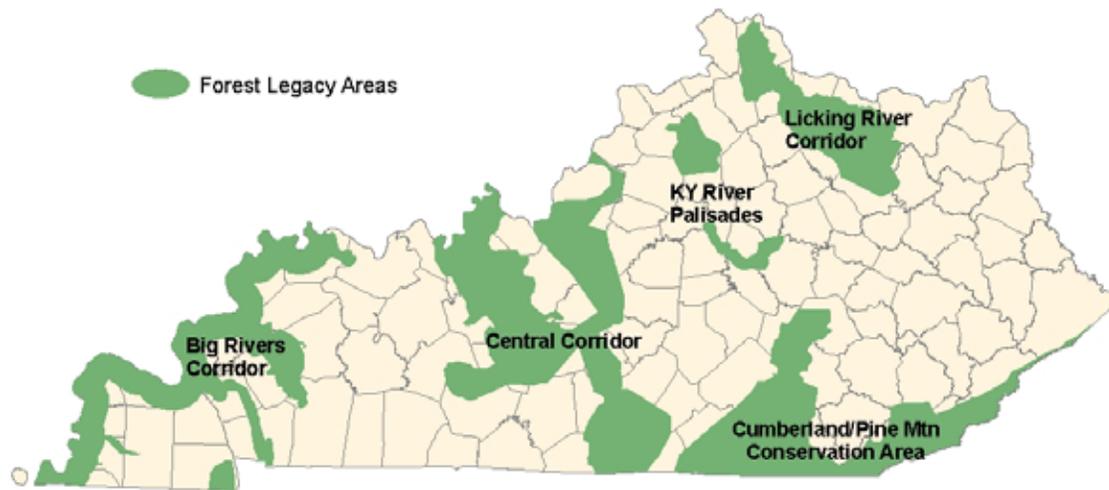


FIGURE 48 – FOREST LEGACY AREAS

The FLAs identified are located within ecologically significant areas of the state. In these areas, forestlands have a likely or imminent threat of being converted to non-forested uses. Also these areas are part of a larger conservation effort by multiple state, federal, and private agencies and/or have a large concentration of existing protected lands that would either be directly or indirectly enhanced by the protection of additional forestlands. Some of the reasons each FLA was selected are listed below.

1. Licking River Corridor
 - Mississippi River Initiative Focus Watershed
 - Large number of mussel species (50 species, 11 of which are endangered)
 - Other threatened or endangered species including the Indiana bat, gray bat, and Short's goldenrod.
 - Contains unique archeological resources such as Blue Licks, Blue Licks Battlefield, and Indian Old Fields.
 - Threats and impairments caused primarily agriculture and urban land use.
2. Kentucky River Palisades
 - Last remaining large forested remnant in the Bluegrass area
 - Large concentration of rare plants including the federally listed running buffalo clover and two other candidates for federal listing as threatened or endangered species.

- Existing nature preserves, WMAs, Raven Run Nature Sanctuary, and Shakertown of Pleasant Hill
 - Includes unique archaeological sites such as Big Bone Lick, Indian Old Fields, and buffalo hunting grounds
 - Imminent threat from urban expansion
3. Cumberland / Pine Mountain Conservation Area
- One of the major migratory corridors for neo-tropical birds including those that federally listed threatened or endangered species.
 - Largest existing forest blocks in Kentucky
 - Numerous threatened and endangered aquatic species
 - Protected areas including Big South Fork National River and Recreational Area, Daniel Boone National Forest, WMAs, State Parks, Kentenia and Kentucky Ridge State Forests, Cumberland Gap National Historic Park, Pine Mountain Trail
 - Threats of mining and urban development along I-75 corridor, near Somerset, and along the proposed I-66 corridor.
4. Central Corridor
- Unique Barrens, Caves, and Knobs
 - Numerous threatened and endangered species including Indiana bat, gray bat, and endemic cave species such as Kentucky cave shrimp
 - Contains the most ecologically significant portion of the Green River which is the most diverse region in Ohio River basin including 11 species of mussels and 16 species of threatened and endangered plants just in the Mammoth Cave region
 - Existing protected areas including Mammoth Cave National Park, Fort Knox Military Reservation, Bernheim Arboretum and Research Forest, Jefferson Memorial Forest, Army Corp of Engineers property around Rough River, Nolin River Lake, and Dale Hollow
 - Forest Legacy Projects at Knobs State Forest and WMA and at Marrowbone Creek State Forest and WMA
 - Imminent threat to urban conversion in the Louisville metropolitan area and along the I-65 corridor.
5. Big Rivers Corridor
- Numerous threatened and endangered species including Indiana bat, interior least tern, and copperbelly watersnake.
 - Kentucky's largest concentration of migratory waterfowl, shore, and wading birds
 - Numerous protected areas including WMAs, Land Between the Lakes National Recreation Area, Shawnee National Forest, Fort Campbell Military Reservation, Clarks River National Wildlife Refuge, Reelfoot Lake National Wildlife Refuge, the proposed Green River National Wildlife Refuge, Pennyrile State Forest, and Green River State Forest
 - Mississippi River Initiative Focus Watersheds
 - Contains the best remaining bottomland hardwood complexes in Kentucky
 - Contains unique archeological resources such Wickliffe Mounds State Historic Site
 - Agricultural land use is the primary threat although some loss to urban and mining.

D. Multi-State Areas

In order to identify multi-state areas that are a regional priority, the KDF contacted representatives of the forest resources in each of the surrounding states. Figure 49 shows the areas that were identified as a result of this process.

Kentucky was identified in four of the potential multi-state projects in West Virginia, namely reforestation of mined lands, development issues along the I-64 corridor, sustaining traditional timber markets and developing non-traditional markets in the Appalachian region, and slowing the spread of the Gypsy Moth. Each of these multi-state projects involves Kentucky's Appalachian Forest Priority Area.

Because invasive species do not recognize borders, multi-state opportunities are available to combat both Emerald Ash Borer and Hemlock Woolly Adelgid. In the tri-state region of Indiana, Ohio, and Kentucky, cooperative strategies on Emerald Ash Borer management could yield better results than individual initiatives. Likewise, collaboration with Virginia and Tennessee on Hemlock Woolly Adelgid management would be beneficial.

The Southern Appalachian Mixed Mesophytic Hardwood Restoration Coal Reclamation Initiative (known as SAMMI) presents a multi-state opportunity in Virginia, Alabama, and Kentucky. Under this project, Priority III coal and non-coal mine reclamation sites are targeted to increase rural forest, watershed management, carbon sequestration and biomass opportunities, and the rural wealth in the Southern Appalachian region.

Missouri identified 22 Forest Opportunity Areas, but only the River Bends Conservation Opportunity Area (COA) bordered Kentucky. The River Bends COA, which borders Kentucky's Big Rivers Forest Priority Area, includes several important blocks of remnant forest centered at Donaldson Point Conservation Area and Big Oak Tree State Park in Missouri.

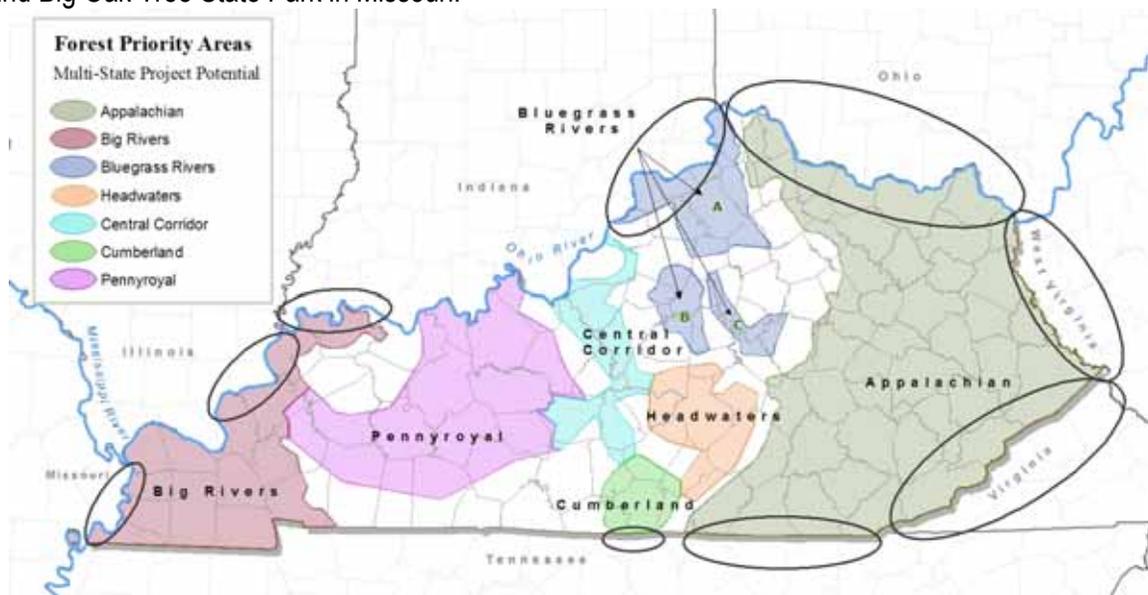


FIGURE 49 – MULTI-STATE OPPORTUNITY AREAS