

FOREST LEGACY PROGRAM ASSESSMENT OF NEED

FOR THE STATE OF ARKANSAS

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EXECUTIVE SUMMARY

In 1990 the Forest Legacy Program (FLP) was established to promote the long-term integrity of forest lands. The Secretary of the U.S. Department of Agriculture (USDA) was directed to establish the FLP in cooperation with state, regional, and other units of government. Landowner participation in the FLP, including the sale of lands and interests in lands, is done entirely on a willing seller, willing buyer basis. The program is implemented through state participation, consistent with National FLP guidelines, and as described in this Assessment of Need (AON). The FLP identifies and protects environmentally important private forestlands that are threatened by conversion to non-forest uses and provides the opportunity for continuation of traditional forest uses such as forest management activities, and outdoor recreation.

The goal of Arkansas' Forest Legacy Program is to focus on environmentally important forest areas that can be effectively protected and managed which have important forest values such as forest based economies, water quality, ground water recharge potential, wildlife, biological diversity and integrity of landscapes, connection to existing forested conservation areas, aesthetics, geologic values, cultural resources, educational, and recreational values threatened by present or future conversion to non-forest uses as viewed by the state. Arkansas geology naturally divides the state into four major ecoregions, they are: the Ozark Mountains, the Ouachita Mountains, the Mississippi Alluvial Valley, and the Upper West Gulf Coastal Plain. With these ecoregions, seven areas have been identified as meeting Arkansas' goal. These areas are designated as Forest Legacy Areas (FLAs) and encompass just under 8.24 million acres of which approximately 4.6 million acres are forested. Selection of FLAs were based on prior ecoregional assessments of water sheds, streams, groundwater recharge areas, wildlife, recreation, aesthetics, geology, biodiversity, threatened and endangered species, unique plant and animal communities, and cultural resources conducted by a wide range of state agencies involved in natural resources management.

Threats to Arkansas forestlands were assessed by the State Stewardship Committee for each FLA. The major threats to Arkansas' forests are: Fragmentation, Parcelization, and Urban and Exurban Sprawl.

Projects will be ranked based on the national ranking criterion. The three criteria are: 1.) Importance; 2.) Threatened; 3.) Strategic. There is a possible 30 points for each criterion. Each State can submit a maximum of three projects per year. The total combined value cannot exceed \$10 million. Regardless of how many projects are submitted, no project may exceed \$7 million individually. Projects are ranked at the state level before going to the USDA Forest Service where it will compete nationally against other state projects for Forest Legacy funding.

Arkansas' AON scientifically justifies a need in the state and serves as a tool to focus attention on the conservation needs of Arkansas' forest resources. Specifically, the purposes of the AON are: To document the need for a Forest Legacy Program in Arkansas; To identify and delineate areas important to Arkansas that meet the eligibility requirements for designation as Forest Legacy Areas; and, To recommend areas to the USDA Forest Service for inclusion in the Forest Legacy Program. Once the AON has been approved projects may be submitted for funding. To be eligible for FLP the lands or interest in lands must fall within in a designated FLA.

1. INTRODUCTION

a. Purpose of the Forest Legacy Program

The Forest Legacy Program was created to protect environmentally important private forest lands from conversion to non forest uses and to promote protection of forestland and other conservation opportunities. These opportunities include protection of important ecological, scenic, cultural, fish, wildlife, water quality, and recreational resources. Almost 60% of Arkansas' 18.4 million acres of forest lands are in private ownership; the following are pressures that private landowners are facing that threaten to convert forest lands to nonforest uses:

- Fragmentation
 - ✓ Higher monetary value;
- Parcelization
 - ✓ Land that is divided into smaller parcels
- Urban/Exurban Sprawl
 - ✓ Greater population density/mobility

Good stewardship of privately held forest lands requires a long-term commitment that can be fostered through a partnership of Federal, State, and local government efforts. In 1990, the Forest Legacy Program was one of several programs established by the USDA to promote the long-term integrity of forestlands. The Secretary of Agriculture, in conjunction with the USDA Forest Service, was directed to establish a Forest Legacy Program in cooperation with state, regional, and other units of government. In carrying out this mandate, the Secretary has been authorized to acquire lands and interests in lands through Fee Purchases or Conservation Easements in perpetuity for inclusion in the Forest Legacy Program.

To be eligible for FLP, properties and interests in lands must be located within identified Forest Legacy Areas (FLAs). These are defined as "a geographic area with important forest and environmental values that satisfies identified Eligibility Criteria and has been delineated, described, and mapped". These lands may be acquired under Forest Legacy Program (FLP) authority by the State (or other governmental entity), only on a willing seller/willing buyer basis. Landowner participation in the Forest Legacy Program, including the sale of lands and interests in lands, is entirely voluntary

b. Background on Creation of the Program

Appreciation for the intrinsic value of the rich, diverse landscapes of Arkansas was evident even before "The Natural State" became the marketing strategy for the state's tourism industry in 1982. In Arkansas, forests are an integral part of this mosaic. The Forest Legacy Program offers an excellent opportunity to ensure that significant measures can be taken to preserve the integrity of Arkansas' forestlands for future generations.

The state of Arkansas is blessed with a vast forest resource covering 18.4 million acres, more than half which is held by private landowners. The forest products industry is the second largest manufacturer in the state. The forest products industry directly accounts for more than 40,000 jobs, a \$1.17 billion payroll in 1995, and contributed \$4 billion to the Arkansas economy. In addition to timber, other resources are highly valued by the State, e.g. outdoor recreation, water quality, wildlife, aesthetics, and biodiversity.

However, these values are increasingly threatened by a number of factors including habitat fragmentation, ownership parcelization, human population demographics (urban sprawl), and management (or lack thereof) that does not protect all the values of environmentally important forests. Although largely a rural state, there are areas facing negative impacts from development and population increases forcing the conversion of forests to non-forest uses. An additional threat is conversion of multiple value forests to those with a narrower range of values.

Nationally, the loss of forest land has been recognized as a concern for at least a century. During the 1900s, various programs and laws were established at the federal, state, and local levels to protect and maintain forestlands. More recently, the Forestry Assistance Act of 1978, as amended, (16 U.S.C. 2103c et.seq.) provided authority for the USDA to give financial, technical, educational, and related assistance to states, communities, and private forest landowners.

Although beneficial, some issues still had not been addressed. In response to those needs, Section 1217 of Title XII of the Food, Agriculture, Conservation and Trade Act of 1990 (P.L. 101-624:104 stat.3359) also referred to as the 1990 Farm Bill, amended the Cooperative Forestry Assistance Act to allow the Secretary of Agriculture to establish the Forest Legacy Program to protect environmentally important forest areas threatened by conversion to non-forest uses through the use of conservation easements and other mechanisms. The goal of the legislation was to protect scenic, cultural, fish, wildlife, water quality, and recreational resources. This authority continues indefinitely, and permitted the outright purchase of threatened forest land (or development rights via conservation easements) by federal agencies. This legislation was further amended in 1996 to allow state agencies to hold the title or easement on properties in the program.

Through the 1996 Farm Bill (federal Agriculture Improvement and Reform Act of 1996; Public Law 104-127); Title III – Conservation; Subtitle G – Forestry; Section 374, Optional State Grant for Forest Legacy Program), the Secretary is authorized, at the request of a participating State, to make a grant to the State to carry out the Forest Legacy Program in the State, including the acquisition by the State of lands and interest in lands.

Arkansas has requested the State Grant Option. In 2004, Governor Mike Huckabee petitioned the USDA Forest Service to allow Arkansas to participate in the Forest Legacy Program with the Arkansas Forestry Commission as the Lead Agency. The Forest Service approved the request pending the development of an Assessment of Need document and its approval.

A Forest Legacy Committee was selected from the State Forest Stewardship Coordinating Committee (SFSCC) to develop the Assessment of Need (AON) document. Additional committee members were recruited from natural resource agencies and organizations with conservation easement experience. The committee represents a cross-section of ownership classes, field training, and expertise for all of Arkansas' natural resources. This document is a product of the input from all these experts dedicated to the conservation of Arkansas' natural resources. Committee members and contact information are included in the Appendix A of the Assessment of Need.

Arkansas' Forest Legacy Program is delivered to the ground through the creation of Forest Legacy Areas (FLAs). The FLAs were created based on the many values of Arkansas' forests recognized by the Arkansas Forest Stewardship Coordinating Committee. Public and private lands under conservation protection, population growth and density, extraordinary resource waters, groundwater recharge zones, and watersheds, USDA Conservation Programs, rare species (animal, plant, and community) element occurrences, scenic areas, timber production, wildlife resources, geologic attributes, cultural resources, and recreational assets were all considered in the design of the FLAs.

Preceding the Forest Legacy Program in Arkansas (1999-2003), agency scientists from Arkansas Natural Heritage Commission, Arkansas Game & Fish Commission, Arkansas Soil & Water Conservation Commission, USDI Fish & Wildlife Service, USDA Forest Service, USDA Natural Resources Conservation Service, The Nature Conservancy, Arkansas Forestry Commission, and Arkansas Department of Environmental Quality participated in a series of ecoregional assessments that focused on biodiversity. From these ecoregional assessments, areas were designated by the group as environmentally important. The development of these areas included environmental factors such as species element occurrence data, soils, geology, ownership, stream courses, watersheds, and water recharge areas and their relationships to one another. Since the assessments contain much of the material needed to design the Forest Legacy Areas (FLAs), and well over one half of these areas are forested, the Forest Stewardship Committee used them in conjunction with other spatial data, such as population density, timber resources, aesthetics, cultural resources, and wildlife to define Arkansas' FLAs.

2. PROGRAM DIRECTION

The federal guidelines for the Forest Legacy Program establish the program's purpose: to ascertain and protect environmentally important forest areas that are threatened by conversion to non-forest uses and promote protection of forestland and other conservation opportunities, such as protecting important ecological values and scenic, cultural, fish, wildlife, water quality, and recreational resources. Traditional forest uses, including timber management, are usually accepted as consistent with the purpose of the program. As a result, the Forest Legacy Program can help protect both the traditional uses of private forestlands and the public values that those lands provide.

GOAL/OBJECTIVES

The goal and objectives listed below are the basis for implementing the Forest Legacy Program in Arkansas. They provide a vision for managing the state program: The goal defines the program direction, and the objectives declare how that intention should be met and provide tactical direction.

a. GOAL

Arkansas' goal for the Forest Legacy Program is to focus on environmentally important forest areas that can be effectively protected and managed which have important values such as forest based economies, water quality, ground water recharge potential, wildlife, biological diversity and integrity of landscapes, connection to existing forested conservation areas, aesthetics, geologic values, cultural resources, educational, and recreational values threatened by present or future conversion to non-forest uses. Our intent is to address all values and not just traditional values. The specific values listed below have been identified by the SFSCC as important to the citizens of Arkansas. This list does not indicate or imply any order of importance.

- Forest based economies;
- Water quality values within the forest;
- Ground water recharge areas;
- Wildlife (including rare, threatened, and endangered species);
- Biological diversity and integrity of landscapes;
- Connection to existing forested conservation areas;
- Aesthetic values of forested landscapes;
- Geologic Values;
- Cultural Resources;
- Legal rights of willing sellers;
- Environmental education;
- Forest-based recreation;

Priority forests should be working forests that exhibit multiple values and provide opportunities for the continuation of traditional forest uses, such as science-based forest management, sustainable timber harvesting, and outdoor recreation.

b. OBJECTIVES

While the goal gives the general intent of the program, the objectives sharpen the vision of the program by identifying the kinds of lands to include in the program. One or more objectives have been identified for each value that was stated earlier. Although the list below separates the objectives by value, close examination will show how these objectives are tied to each value and reflect the program's goal.

Forest based economies

- Promote the continued or potential use of lands for sustainable commodity production (working forest).
- Link working forest landscapes
- Sustain or enhance forest based employment
- Protect the economic value of all forest uses

Water quality values within the forest

- Protect important riparian forest functions
- Maintain forested wetlands
- Protect watersheds of state identified extraordinary resource waters

Ground water recharge areas

- Enhance recharge benefits to important aquifers and/or enhance protection of priority watersheds.
- Protect important karst (cave) recharge areas.

Wildlife

- Provide access for hunting and wildlife viewing as appropriate for public benefit and to maintain game animal populations.
- Protect rare, threatened and endangered animals & their key habitat
- Protect, enhance and/or buffer important habitat.
- Promote appropriate forest management practices for wildlife.
- Promote and maintain wildlife corridors.

Biological diversity and integrity of landscapes

- Protect rare or important forested ecological systems and their functions.
- Protect species and biological communities at a scale that ensures species viability.
- Protect landscape scale areas that support native species and natural communities.

Connection to existing forested conservation areas

- Link permanently protected forested conservation areas, public and private.
- Add new tracts as a part of an organized planning effort or “Initiative” to create additional conservation areas.

Aesthetic values of forested landscapes

- Protect lands with special scenic values.

Geologic values

- Maintain, protect, and provide access to outstanding geologic attributes for public education, and recreation as appropriate, e.g. important karst formations, and exposed rock outcrops.

Cultural resources

- Protect existing prehistoric/historic cultural sites
- As new sites are found, protect, record, and add to cultural resource database.
- Provide access for public education as appropriate.

Legal rights of willing sellers

- Protect the voluntary nature of the program.
- Provide landowners with alternatives to development of forest properties through conservation easements or fee title purchase.

Environmental education

- Provide models of multiple-use forestry to the public
- Allow access for outdoor education for a wide range of user groups as appropriate.

Forest-based Recreation

- Allow recreational opportunities whenever appropriate.
- Increase public access accordingly.

3. PAST & PRESENT FOREST RESOURCE CONDITIONS

a. Arkansas Forests: A Historical Perspective

When the English naturalist Thomas Nuttall journeyed across Arkansas in 1819, he saw a vast wilderness. There were extensive tall grass prairies, pine woodlands, and large areas covered by massive bald cypress and bottomland hardwoods at that time - landscapes teeming with wildlife like the Carolina parakeets, greater prairie chickens, and red wolves. Nearly two centuries later, much of what Nuttall observed has been lost, with tall grass prairies converted into agricultural fields, old-growth forests cut-over and replaced with pine plantations, and free-flowing rivers dammed and channelized. With destruction of native habitat, many plant and animal species have declined. Plants such as the snowy orchid, Texas paintbrush, and slender marsh pink have not been seen in Arkansas for decades. However, there is much hope for the forests of Arkansas. The recent rediscovery of the Ivory-Billed Woodpecker in the swamps of Arkansas' delta proves that native forest habitat can be revitalized and maintained through modern conservation efforts.

Recently, Dr. John Gray summarized the history of forests in Arkansas. Dr. Gray began by pointing out that forests have been a dominant element in the Arkansas environment throughout our state's history, and continued:

• Time of Settlement to 1880

As settlement continued, following the War of 1812, forests covered 96 percent of what is now Arkansas. In the Delta, the virgin forest consisted of magnificent stands of bottomland oaks, gums, ash, other hardwoods, and bald cypress. In the West Gulf Coastal Plain, shortleaf pine (our state tree) and loblolly pine, and mixtures of pine and hardwood dominated the forest landscape. In the Ouachita Mountains, drier sites supported shortleaf pine and pine-hardwood mixtures and hardwoods grew on the moister, cooler aspects. In the Ozarks, oaks, hickories, gums and other upland hardwoods occupied the forest for the most part. In addition to land clearing for farming and settlement there was limited timber harvesting. Most harvesting provided for local building, and products for home use (firewood, fence posts and other uses.) In southern Arkansas, logs were rafted down the rivers to Louisiana sawmills. All of these activities had a limited impact on the largely virgin forests.

- **Pre-Forestry Exploitation Era**

The situation changed in the 1880's, when the state's rail network expanded from 800 to 2200 miles of track. This not only provided access to a much greater proportion of forest, but also connected rail lines to major lumber markets in Midwestern and eastern cities.

Large lumber companies from the Lake States and Midwest, backed by northern capital, moved here, bought up large tracts of timber, built mills, and began large scale liquidation harvesting. From 1879 to 1909, the peak production year of, what might be termed, the "Pre-Forestry Exploitation Era", Arkansas lumber production increased twelve-fold. In 1909, the lumber industry employed 73 percent of all factory wage earners in Arkansas. However, by the end of the 1920's; the initial timber-harvesting boom was over. Many of the big mills had closed up completely or moved operations westward. In most cases, paper manufacturers and small portable-type mills able to operate on the scattered, smaller trees left behind took over the industry. As an example, International Paper Company opened the first pulp and paper mill in Camden, Arkansas in 1928.

The first field survey of Arkansas forest conditions in 1929 found the situation grim. Of the 22 million total acres of land remaining in forest at that time (65 percent of the total land area), 20 million acres had been cut over. Although 85 percent of the harvested area had naturally reseeded or resprouted, 70 percent of these new stands had experienced severe damage by wildfires. During the survey year (1929), 11,000 such fires burned 2.5 million acres, or more than 11 percent of the total forest in just one year. Most of this loss was due to a strong tradition of woods burning by Arkansans.

- **Initial Recovery, 1930 to 1953**

During the 1930's and 1940's a substantial recovery of forests occurred because of several factors. First, not all of the forest products companies that came here during the exploitation era "cut-out and got-out." A number of the more far-sighted ones, which included Union Sawmill Company at Huttig, Malvern Lumber Company, Crossett, Dierks, Ozan Company at Prescott, Ozark-Badger at Wilmar, International Paper at Camden, and others, began taking steps to assure a continuing supply of timber ("sustainable forestry") from their own lands. These included providing fire protection, selective logging, and reserving seed trees to restock sites after final harvesting.

A major public forest ownership and conservation effort in 1907 and 1908 reserved an initial 1.1 million acres of federal public domain land as the Arkansas (now Ouachita) and Ozark National Forests. Almost immediately, the newly created U.S. Forest Service began providing protection from fire, trespass, and timber theft to these lands. A state initiative created the Arkansas Forestry Commission in 1930, bringing all non-federal forestland under state-provided forest fire protection.

During the 1930's, the newly established Forestry Commission and the two National Forests benefited greatly from services provided by the Depression Era Civilian Conservation Corps (CCC) Program. CCC enrollees from the 13 camps established in Arkansas helped fight forest fires, built fire lookout towers, and constructed roads, campgrounds, picnic areas and swimming lakes on the National Forests. They also planted trees on thousands of acres of worn out and eroded highland farmland added to these National Forests in the 1930's from purchase and transfer by the U.S. Department of Agriculture's Resettlement Administration Program. A sharp decline in building, and the corresponding lower demand for lumber,

reduced harvesting pressure on the recovering forest in the 1930's. Furthermore, by the 1940's, home heating and cooking had largely shifted away from using wood as fuel.

The first statewide systematic survey of Arkansas forest conditions conducted by the USDA Forest Service reflected some of these factors. This 1953 report showed that although 2.5 million acres of forests had been lost since 1929 to other land uses (mainly to farm expansion in the Delta) overall forest cover had stabilized. Yearly pine growth was 13 percent greater than removals; while the annual hardwood growth surplus exceeded 60%. In addition, fire protection proved effective almost immediately, only 90,000 acres per year were lost to fire on the 60 percent of the forest under state protection by the late 1940s.

• **Growth Over The Next 45 Years**

The 45 years from around 1950 to mid-1990 were marked by major increases in demand for all forest-related commodities. There was explosive growth in forest-based outdoor recreation especially, but not exclusively, on the forests in public ownership. From 1948 to 1998, there was an 86 percent increase in hunting licenses and a 132 percent increase in fishing licenses issued by the Arkansas Game and Fish Commission. By 1996, the two National Forests of Arkansas were providing nearly 4 million recreation visitor days per year. These factors, and the growth in travel and tourism, made the appearances of forestlands and forest operations a public issue. Changes in ownership, industrial to non-industrial, and forest management, non-intensive to intensive, are the trends that bring Arkansas' forests to 2005. Figure 1 was taken from the Southern Research Station, Resource Bulletin SRS-99, "Arkansas' Timber Industry-An assessment of Timber Product Output and Use, 2002". It represents an increasing trend in wood products usage within a 45 year period.

Roundwood production for all products by species group and year.

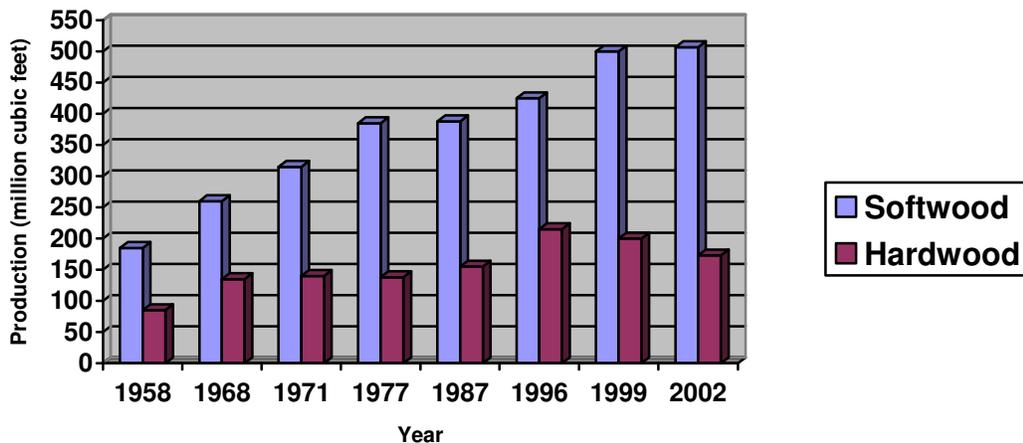


Figure 1

b. **Arkansas' Forest: Current Conditions**

Since 1995, land ownership patterns have remained relatively constant. However, The Arkansas Forest Status and Change Report pointed out significant changes in forest composition. At that time, forest plantations increased by 600,000 acres in less than a

decade. Half of the increase was in the forest industry sector and most of the remainder in the non-industrial private forest sector. Combined with conversion and parcelization, large blocks of current forestlands are increasingly threatened by landcover changes and non-forest interests. The recently released Southern Forest Resource Assessment confirms these trends, and predicts more for the future.

- **Geology, Climate**

Arkansas is roughly evenly divided between lowlands and highlands, with elevations ranging between approximately 50 feet above mean sea level in the southeast to 2,823 feet at the top of Mt. Magazine. The state is located between 33° and 36° 30' North latitude, and 89° 41' and 94° 42' West longitude. Between 1961 and 1990, maximum and minimum temperatures for Little Rock, the state capital, were recorded as high as 112° in July and as low as -5° in February, with an annual average precipitation of 50.86 inches. Growing seasons range from 180 days in the high northwestern Ozark Plateau to as long as 240 days in the eastern Delta region.

- **Geologic Features**

Ecologist and managers have identified six natural divisions in Arkansas, including: (1) the Ozark Mountains; (2) the Ouachita Mountains; (3) Crowley's Ridge; (4) the Gulf Coastal Plain; (5) the Arkansas River Valley; and (6) the Mississippi Alluvial Plain. For this AON these divisions have been condensed into four, with the Crowley's Ridge natural division being merged with the Mississippi Alluvial Plain and the Arkansas River Valley appended to the Ouachita Mountains. Figure 2 shows the Ecoregions of Arkansas.

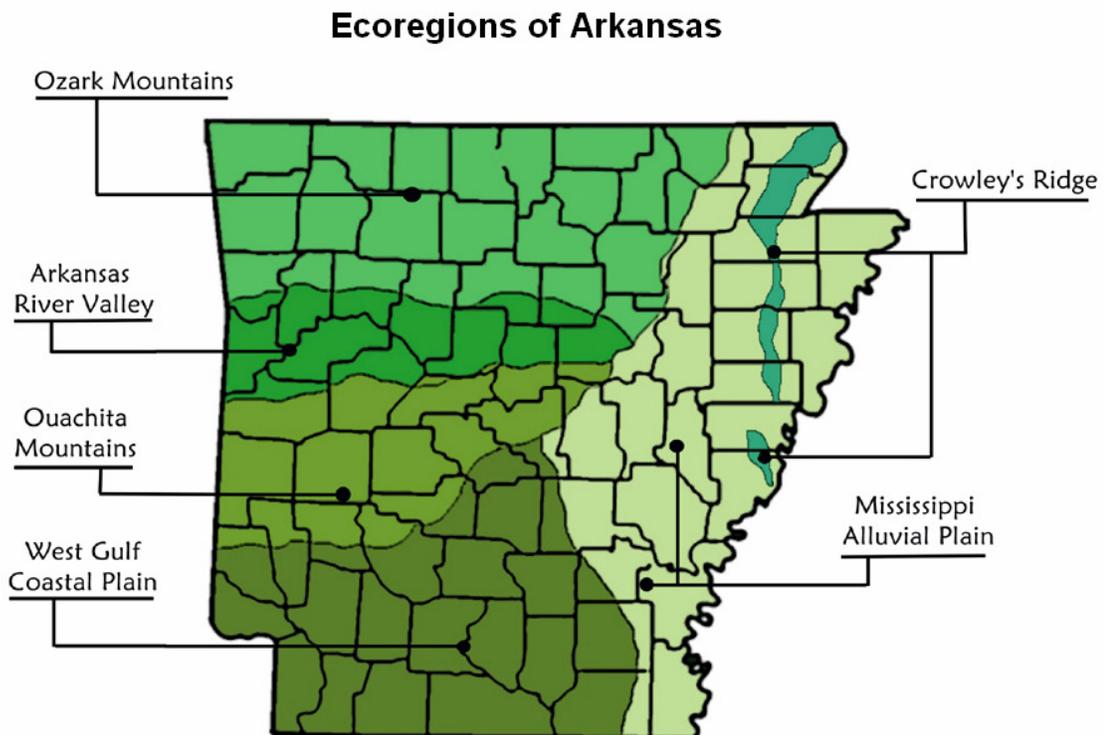


Figure 2

- **Forest Coverage and Composition**

Over half of the forestlands in Arkansas are oak and other hardwoods and 41% are softwoods dominated by pine. Arkansas is an important wood producer, contributing 3.5% of the total production in the United States. Arkansas' forests provide a number of benefits in addition to the obvious economic proceeds. They support a diverse system of values that reach beyond scenic beauty and outdoor recreation to encompass critical wildlife and biodiversity concerns and the maintenance of clean air and water. Figure 3 shows the Arkansas Landcover types.

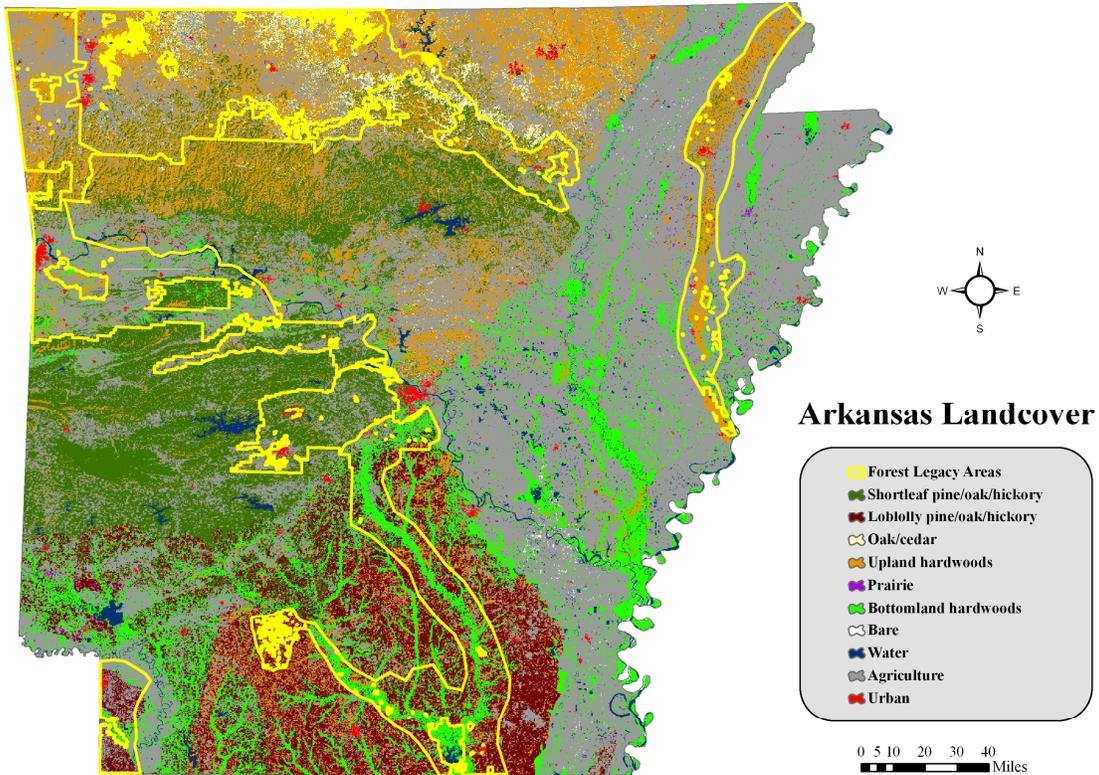


Figure 3

- **Arkansas Forest Ownership and Control**

Arkansas Forestry Statistics reported on the National Association of State Foresters website reflect that forested land covers 18.4 million acres (55%) of the 33.3 million acres in Arkansas. Figure 4 shows the Arkansas Forest Land Ownership by landowner category.

**Arkansas Forest Land Ownership
2002 State Forestry Statistics
National Association of State Foresters**

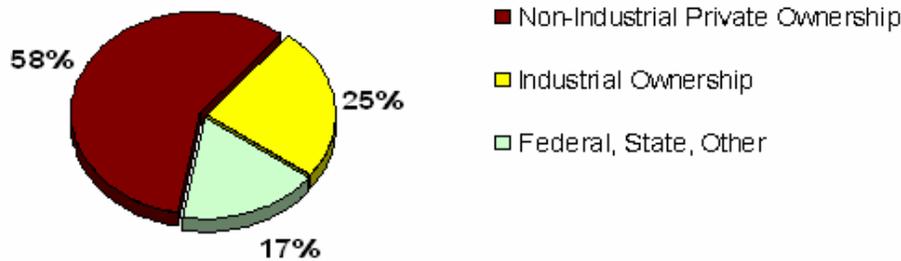


Figure 4

Arkansas' forest ownerships are categorized in three groups: government, forest industry, and non-industrial private forest owners. Non-industrial private forest owners own most of Arkansas' forestlands, and almost half of them live in the Ozarks region. The forest industry controls about one-fourth of Arkansas timberland, primarily in the southern half of the state. With combined acreage exceeding two million acres, the Ozark-St. Francis and Ouachita National Forests comprise the largest portion of publicly owned land. Other public lands include parks, wildlife refuges and management areas, military bases, state natural areas and forests, and some county and municipal lands.

ARKANSAS FOREST RESOURCE VALUES

• Timber/Wood Products

"Arkansas' Timber Industry – An Assessment of Timber Product Output and Uses, 2002" reports that out of a total 707 million cubic feet of round wood produced, 49% came from non-industrial private forests, 46% came from forest industry, and the remaining 5% were from public lands. The Assessment also points to regional trends within the State that indicate areas of increase and decrease of roundwood and saw log production. Figure 5 depicts the total timber harvested by county.

In general areas that are mostly forested versus agricultural or other land uses depend more on timber production and have more wood processing facilities. Of the four ecoregions, the Ozark, Ouachita, and Upper West Gulf Coastal Plain (UWGCP), are the primary wood producers in the State with the UWGCP producing 70% of the total roundwood. Since 1999, UWGCP and the Delta regions show decreases in all types of wood produced. While the Ozark and Ouachita experienced increases. Forest resources in the Ozark region are becoming more valuable as real-estate becomes less available. The trend towards vacation and retirement homes and a growing population make natural resource conservation more important.

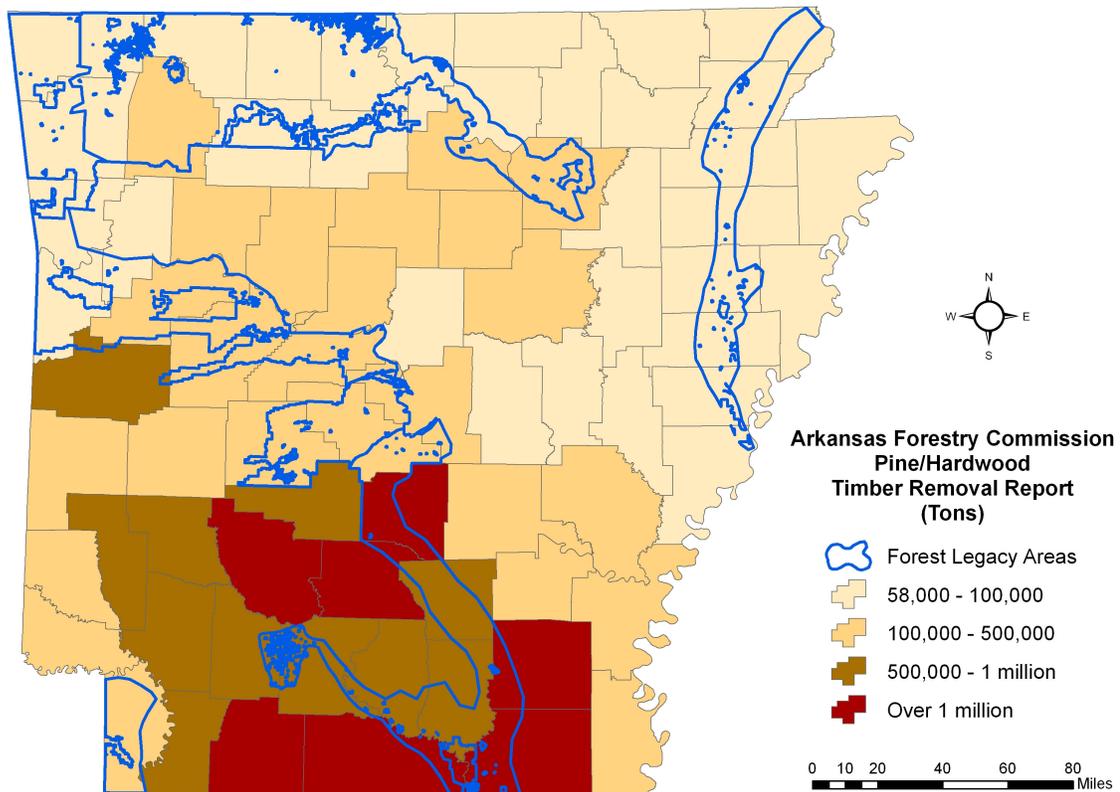


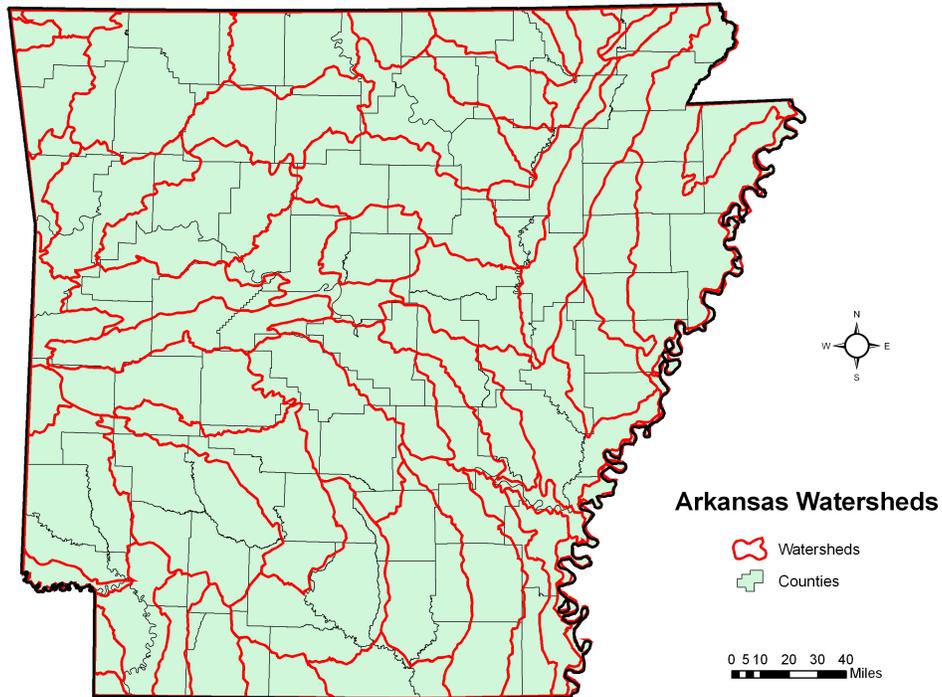
Figure 5

• **Watersheds**

Arkansas' abundant aquatic resources include a myriad of streams and standing-water environments ranging from ponds and large natural lakes to man-made lakes. Within or along its borders are found 9,740 miles of streams and 453,868 acres of lakes, with a total surface area exceeding 1,100 square miles. Aquatic ecosystems tend to mirror the character of the natural divisions in which they are found. In the Coastal Plain and the Delta, lowland streams meander freely over flat alluvial bottoms composed of silt, organic debris, and, rarely, gravel. In the Ozark and Ouachita mountains, where stream gradients are steeper, the clear water flows over bedrock, boulders, gravel, and sand. Crowley's Ridge has small springs and clear upland streams with substrates of silt, gravel, clay, and sand.

Pressure on this vital resource has increased dramatically. Over a recent 20-year period, water use in Arkansas increased by 200 percent, with expectations to increase by another 140 percent by the year 2030. The Arkansas Department of Health has documented the major sources of public water in the state including lakes, rivers, wells, and wells affected by ground water. It is estimated that there are 1,650 public sources of water, of which 266 of these sources are affected by ground water. Forty-three percent of these affected by ground water are captured in Forest Legacy Areas. All this brings focus to the watershed protection functions and relationships within forests. Figure 6 shows the watershed boundaries. Clean

water is an important resource produced by our forest legacy areas. A set of voluntary "Best Management Practice Standards" aim to minimize non-point source pollution of lakes and streams from logging and other forest operations under provisions of the Clean Water Act of 1972.



Watershed Boundaries were produced by ARFO GIS/RS lab on June 17, 2005

Figure 6

Figure 6a shows the FLA's in relation to the Arkansas Priority Watersheds. The Priority Watersheds were defined by the Arkansas Non-point Source Pollution Management Program. Priority Watersheds are watersheds where there are known impairments or significant threats to water quality from present and future activities.

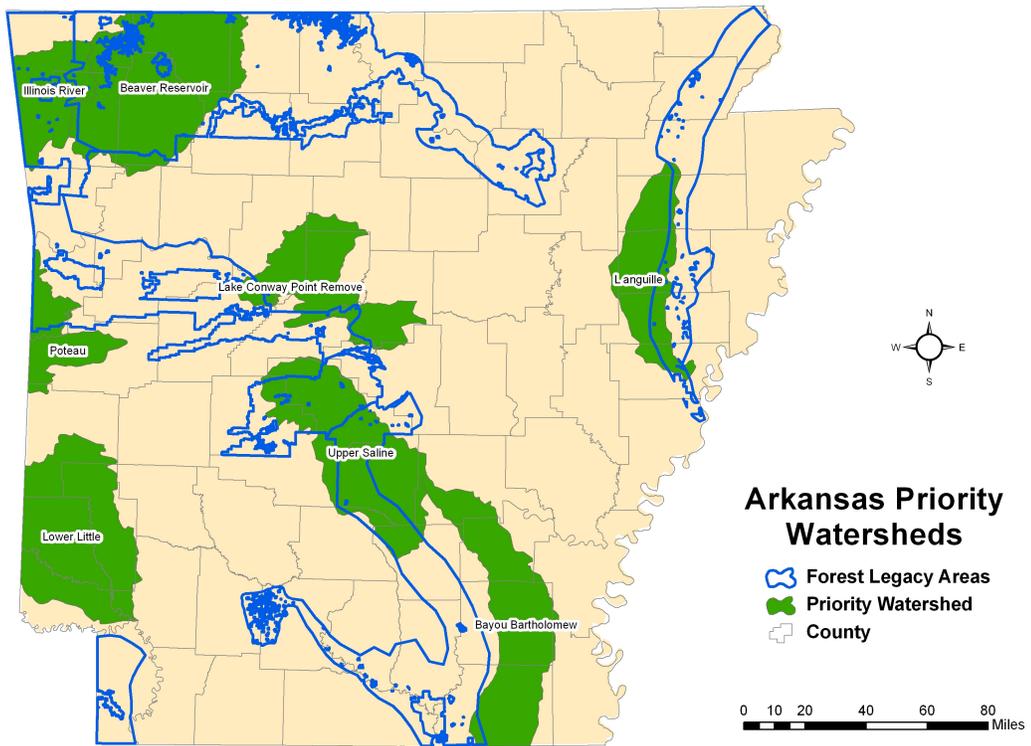


Figure 6a

The Extraordinary Resource Water (ERW) designation protects a water body by recognizing its distinct combination of chemical, physical, and biological attributes characterized by scenic beauty, aesthetics, scientific values, recreation potential and intangible social values. Figure 7 shows the ERWs. Significant physical alterations of the habitat within these waterways are not allowed.

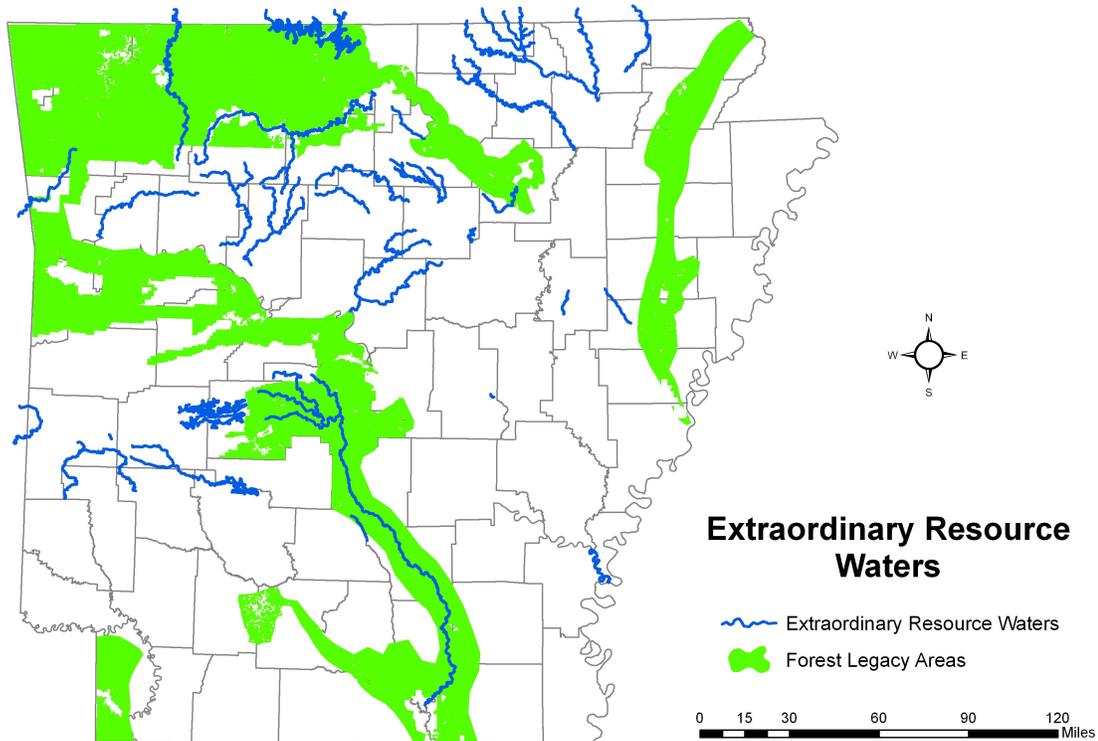


Figure 7

Generalized areas throughout the State that potentially influence aquifer recharge. Figure 8 depicts the generalized areas indicating potential for aquifer recharge. It is difficult to accurately depict all areas, especially in the western portion of the state where there are no appreciable aquifers to speak of, only small, sporadic pockets. An aquifer is considered any area that consistently produces a usable supply of water. In areas with heavy rock and/or clay that inhibit the movement of water, supplies of water from wells come from unreliable sources that form between layers of rock. As the demand for clean, useable water continues, these sources will become less reliable, placing more demand on infrastructure in rural areas and increased pressures on water sources elsewhere. Although there are wells in the area symbolized in red, the water in this area comes from water located in the alluvium found near river valleys or in crevices between rock layers and soil types that tend to run dry at some point during the year. There are, however, significant areas where groundwater can pass through layers of soil and rock to influence a particular aquifer. Generally these areas are located along the diagonal fault line that occurs from the northeast to the southwest. It is here that water has the greatest potential to influence aquifers located in the lowlands to the east. These well-defined aquifers in the Mississippi delta lowlands and karst aquifers in the mountainous portions of the state are being depleted of important water resources. These FLAs would protect forests which provide clean water.

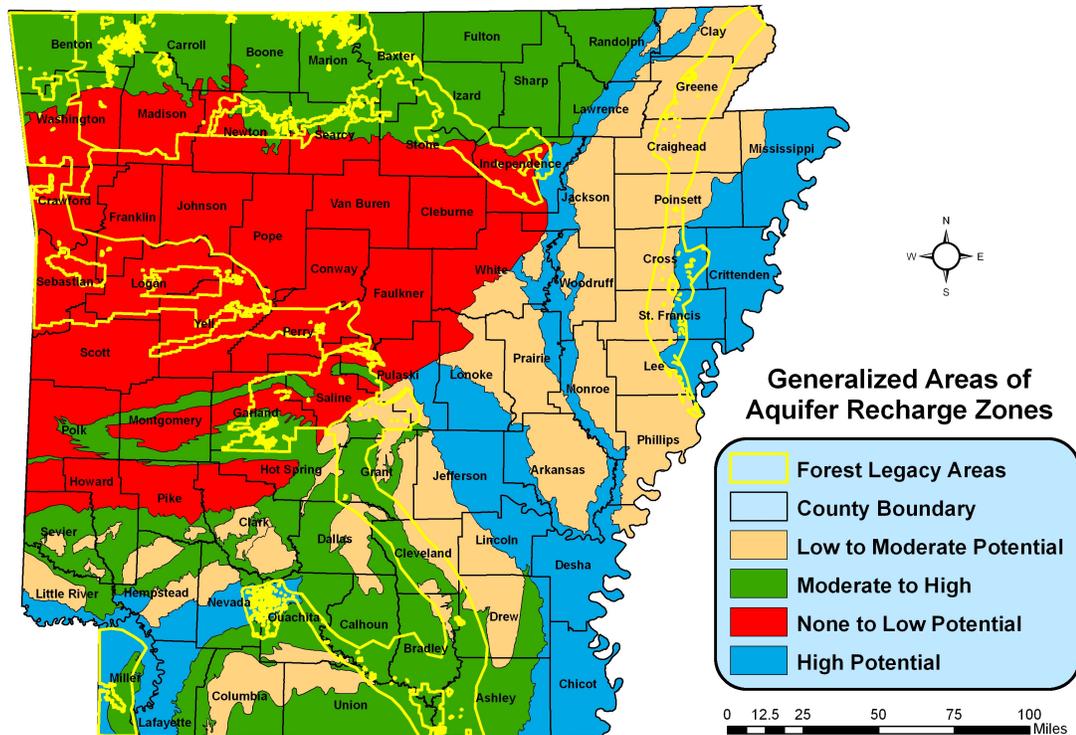


Figure 8

• **Wildlife**

In 1541 – 1542, a member of DeSoto’s expedition noted in his journal that bison, deer, turkey, wild cats, panthers, bear, waterfowl, and fish were abounding. In 1829, two hunters were noted to have killed 69 deer in one day at Bayou Meto. Although some species were hunted to very low numbers, most have made successful comebacks and are now thriving. For instance, Arkansas is world-renowned for its ducks and deer. As pointed out in the Recreation section, current sales of hunting licenses point to the abundant deer, turkey, and duck populations in Arkansas. Habitat is vital to the survival of all animals, especially forest habitat for some species.

Successful elk and black bear restoration projects are currently in progress in Arkansas. The elk restoration project is concentrated along the Buffalo National River in the Ozark region. The black bear restoration project consists of relocating bears from White River National Wildlife Refuge in the Delta region to the area in and around Felsenthal National Wildlife Refuge in the West Gulf Coastal Plain region. Both elk and black bear are forest-dependent species that will benefit by protecting the state’s forest heritage. A vast majority of State and Federal wildlife management areas and refuges are either adjacent or within Forest Legacy Areas.

• **Threatened and Endangered (T/E) Animal and Plant Species**

Arkansas is home to numerous federally listed threatened or endangered animal and plant species and candidates for listing (See Appendix B). Foremost among these is the

endangered Ivory-billed woodpecker, thought to be extinct but recently discovered in the Big Woods of the Delta region. Other federally listed or candidate species include eleven freshwater mussels (seven endangered, one threatened, three candidate), six fish (one endangered; three threatened, one of which is of historic occurrence and probably extirpated in Arkansas; two candidate), two cave crayfish (both endangered), one snail (endangered), four mammals (all endangered, one of which is of historic occurrence), one amphibian (candidate), four birds (three endangered, one of which is of historic occurrence; one threatened), one insect (endangered), and five plants (four endangered, one of which is of historic occurrence; one threatened).

The majority of these species are either forest-dependent or are aquatic species indirectly affected by conditions maintained and/or enhanced by forests, and thus will benefit by protecting forests from conversion to non-forest or incompatible uses.

- **Diversity (Rare Species and Natural Communities)**

The Research Section of the Arkansas Natural Heritage Commission is responsible for building, maintaining, and refining the Natural Heritage Inventory, known as the “Arkansas Heritage Program.” The aim of ANHC research is to locate high-quality examples of each type of natural community in the state, determine which species of native plants and animals most need habitat protection, and where the best habitats for these species are located. The research component of inventory work includes surveys of scientific literature, museum collections, and herbaria specimens combined with examination of maps, aerial photographs, and satellite imagery. On-the-ground field surveys locate and assess the condition of rare species and high-quality natural communities across the state.

Coordination with other state agencies, universities, and resource professionals has brought the list, which totals 11,275 site-specific records, great acceptance and high regard. The map of their locations is pictured in Figure 9.

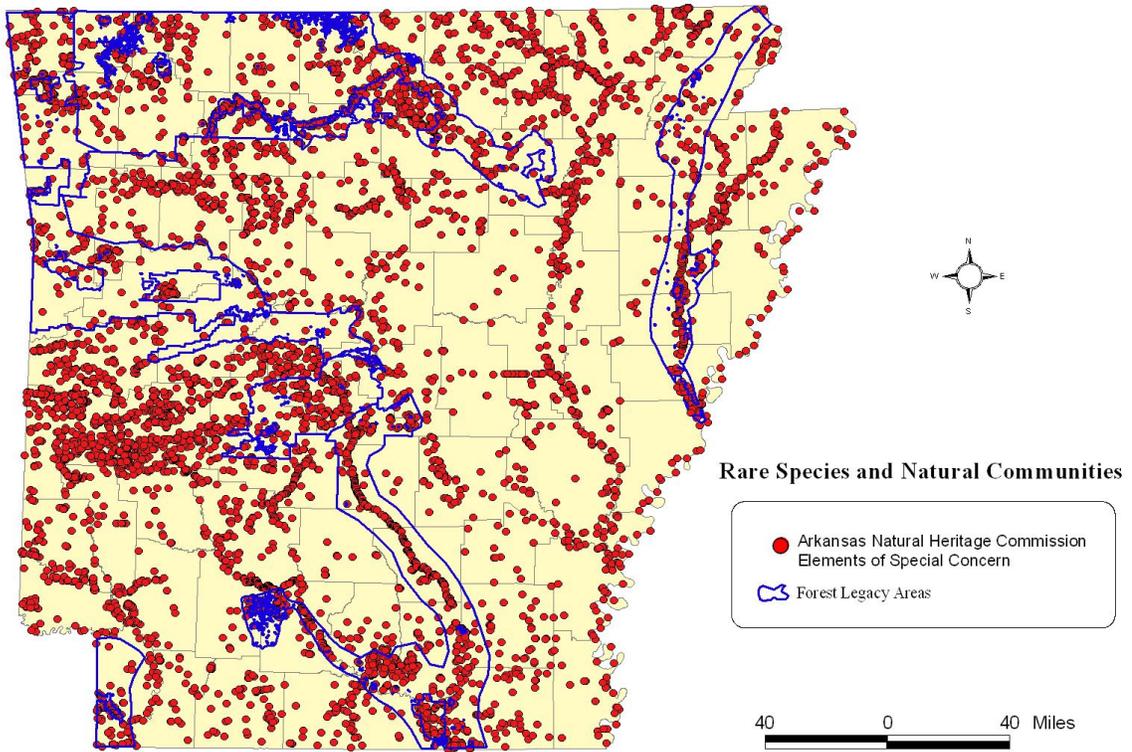


Figure 9

- **Locations of Unique Natural Features or Communities, as Currently Identified for the State of Arkansas.**

Where these “elements” are concentrated, locations are identified that hold exceptional importance for the state’s natural diversity. A systematic analysis of natural heritage data identified areas of significant biodiversity in Arkansas, pictured in Figure 10.

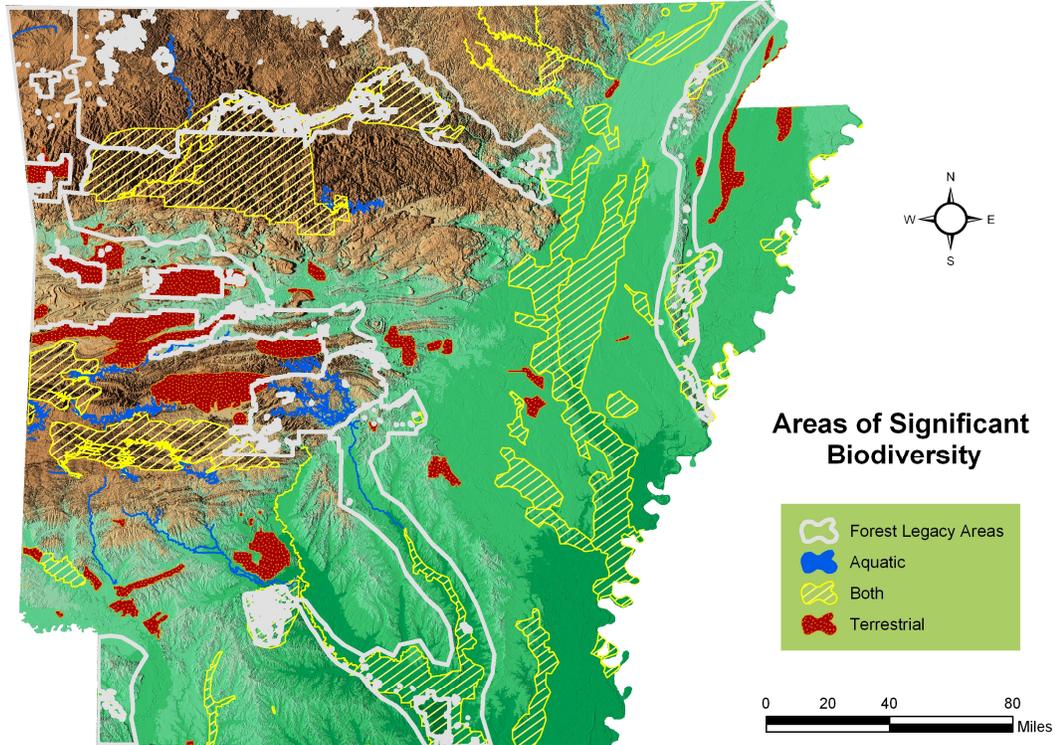


Figure 10

Lands Currently Under Conservation Protection

It is estimated that there are 4.4 million acres of forest land currently being protected in Arkansas, of which 59% is in the two National Forests. Figure 11 depicts the location of these lands and the different ownership classes that manage them. 14.5% of these protected lands are located within designated Forest Legacy Areas. It should be noted that land trust organizations, however small and scattered, are present in Arkansas and account for less than 1,000 acres of protected land. These lands were not added to the map in Figure 11 due to their small size. A list of active land trusts in the state is provided in Appendix F. It is a strategic goal of Arkansas' Forest Legacy Program to connect these conservation areas to forested lands that are currently not being protected for long term benefits to the public.

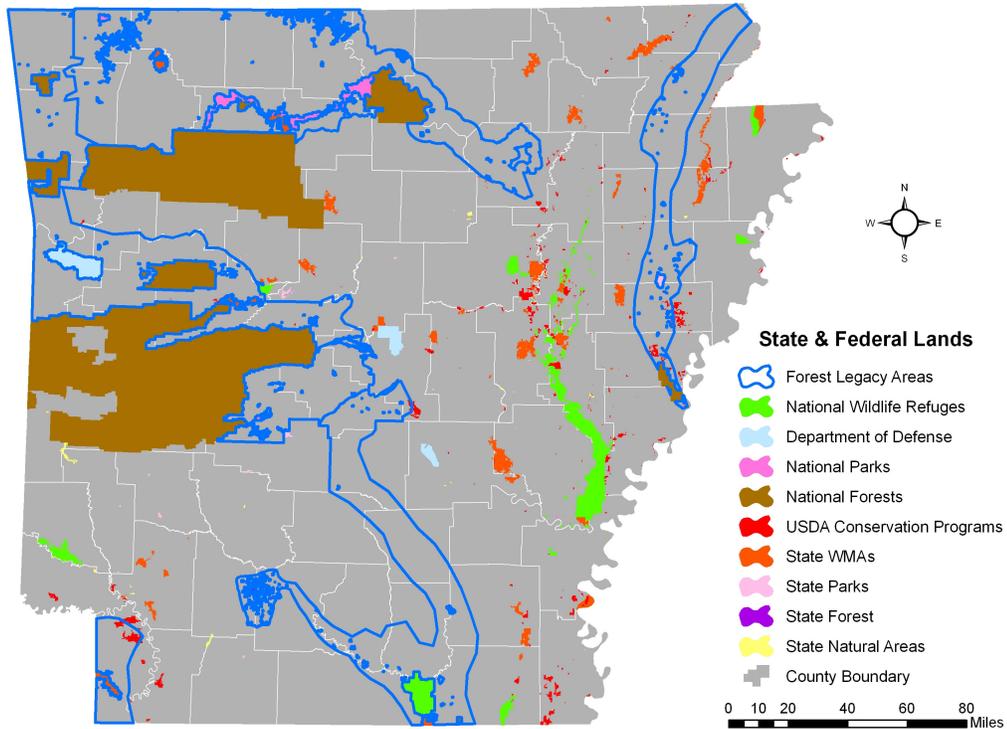


Figure 11

• **Aesthetics and Scenic Resources**

The four ecoregions of Arkansas offer a variety of experiences ranging from a view from the top of an Ozark or Ouachita mountain to the fragrance of pine forests which abound in the rolling hills of South Arkansas' Gulf Coastal Plain to the Delta flatlands leveled by the Mississippi River. Towering pines, lush hardwoods, large lakes, flowing waterways, fertile delta highlands, abundant wildflowers and a variety of wildlife provide many opportunities for outdoor enthusiasts who enjoy experiencing Arkansas' beauty by exploring the state's plentiful natural resources.

Arkansas highways offer some incredibly scenic views of The Natural State. Along those routes are forests aplenty to explore the history and heritage, as well as the great outdoors, of Arkansas' diverse geographical regions.

Arkansas scenic highway 7 traverses the north-south length of the state from Harrison to Louisiana, offering spectacular views as it passes through the Ozark and Ouachita mountains en route to the state's "oil boom" region. The Boston Mountains Scenic Loop consists of two state scenic byways -- U.S. 71 and Interstate 540 -- that provide two very different experiences of the Boston Mountains, the highest portion of the Ozarks.



Figure 12 Scenic view of the Ozark Mountains

Higher still reaches the Mount Magazine Scenic Byway, which travels across the state's highest peak at 2,753 feet, and the Talimena Scenic Drive, new scenic byway, which rides the forested ridge of the state's second highest peak and stretches from Mena, Arkansas, to Tahlequah, Oklahoma.

Eastern Arkansas lies within the nation's largest alluvial plain, a vast flatland leveled over eons by the erosive floods, depositions of silt and course changes of the Mississippi River and its tributaries. Known in the region as "the Delta," the plain covers in eastern Arkansas alone more than 15,000 square miles, including all or part of 27 of the state's 75 counties. The agricultural Delta of eastern Arkansas is home to two national scenic byways: the Great River Road (Arkansas) and Crowley's Ridge Parkway.

For much of its length, the Great River Road (Arkansas) journeys through those agricultural lands, passing remnants of the original wetlands and traveling through towns whose histories and economies were influenced by the river. From Marianna to Helena, however, the route penetrates the woodlands of the St. Francis National Forest on Crowley's Ridge.

- **Potential Mineral Resources & Outstanding Geological Features**

Arkansas' geology is divided into a highland area in the northwest and a lowland region in the south and east. It stretches from the Mississippi River on its eastern edge, where historic movement of the riverbed has left behind the original state borderlines, to the more settled Paleozoic rocks of the Ouachita Mountains on the west and the Ozark Mountains to their north.

A diagonal boundary that crosses the heart of the state, from the northeast to the southwest as seen in Figure 13, is the edge of the Mississippi Embayment, a wide trough

in the North American craton where the continent tried to split. The crack has remained seismically active ever since. Just north of the state line along the Mississippi River is where the great New Madrid earthquakes of 1811–12 occurred.

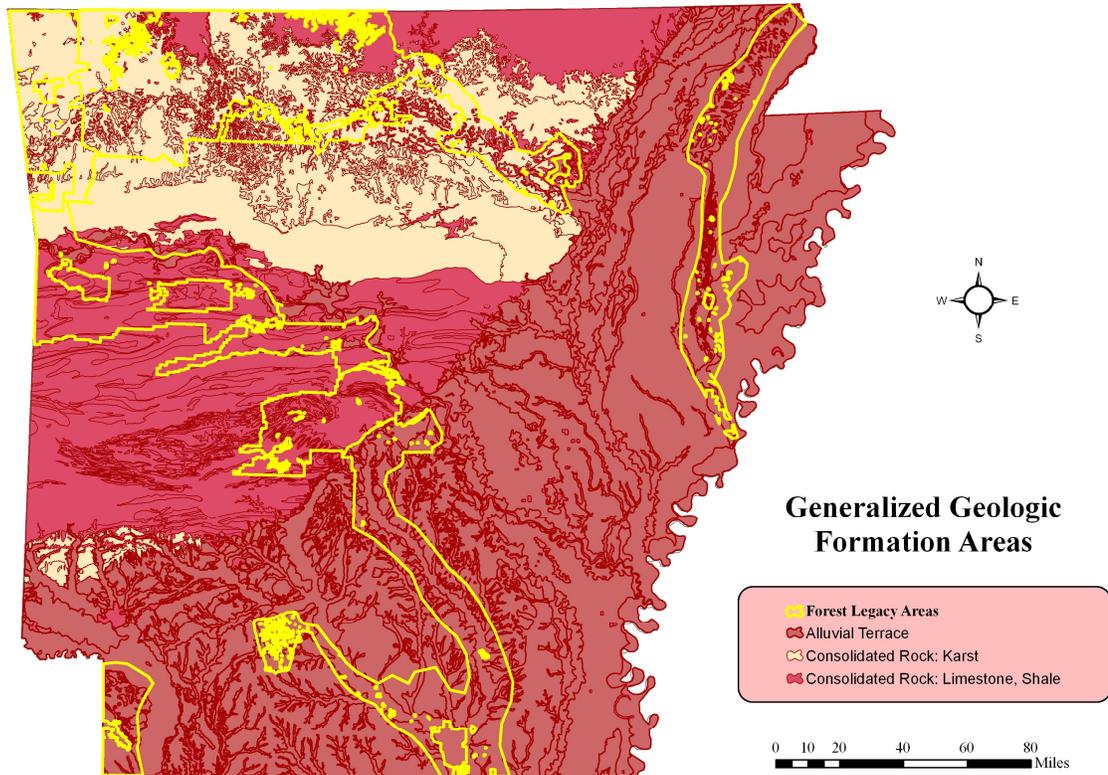


Figure 13

The Ouachita Mountains are actually part of the same foldbelt as the Appalachian range, separated from it by the Mississippi Embayment. Like the Appalachians, these rocks produce coal and natural gas as well as various metals. The southwestern corner of the state yields petroleum from its early Cenozoic strata. And just on the border between these two regions, a rare body of lamproite is the only diamond-producing locality in the United States. Arkansas' rocks, minerals, fossils, fossil fuels, and its water resources resulted from prolonged episodes of deposition, mountain building, and erosion. The interaction of these and other processes was variable throughout Arkansas. Long-term changes in climate were also significant.

• **Cultural Resources**

Contact between Native-Americans and European explorers were sporadic until the French founded the Arkansas Post in 1686. Between the late eighteenth and early twentieth centuries, the influx of mainly Anglo-American settlers from states east of the Mississippi River had gradually supplanted the existing French and Native American cultures. The Arkansas Historic Preservation Program has surveyed and recorded more than 23,700 historic resources in the state, while the Arkansas Archaeological Survey has files on more than 30,000 archaeological sites. Large concentrations of archaeological sites have been

recorded in the northwest portion of the state and in several Delta counties as shown in Figure 14.

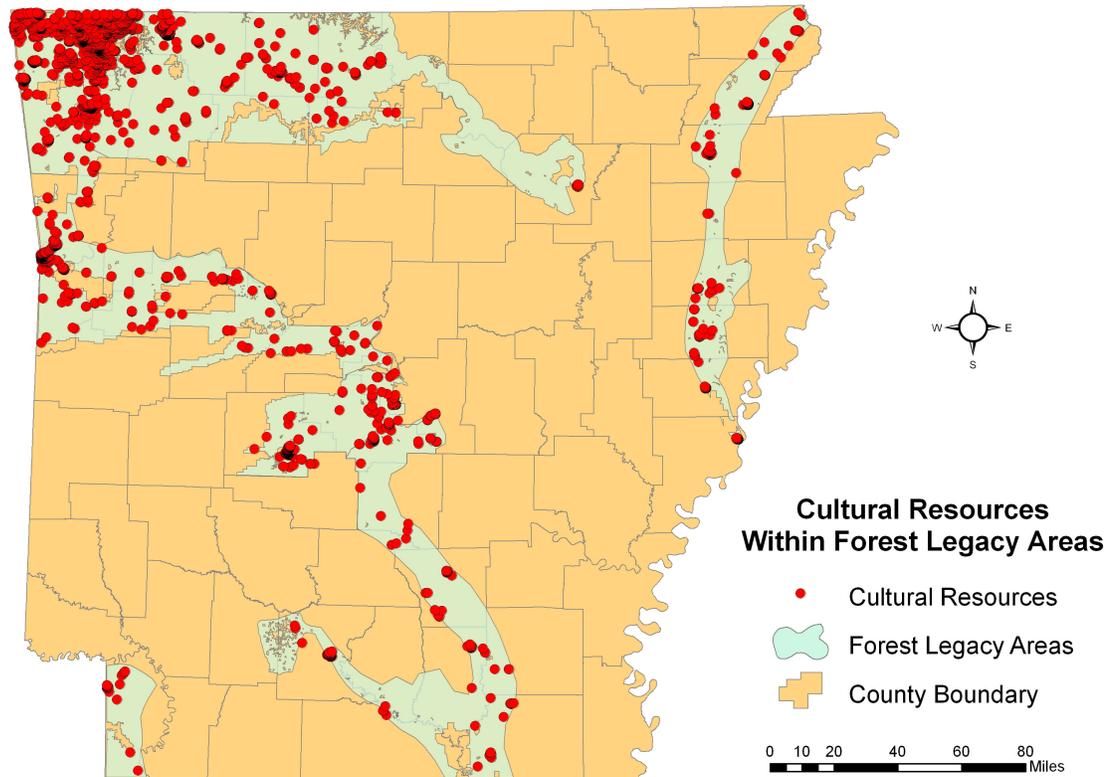


Figure 14

Examples of prehistoric archaeological sites in Arkansas include earthen mounds, rock quarries, fishing weirs, and burial plots. Examples of historic sites that exist in or beside Arkansas' forests include Civil War battlefields, German and Italian prison-of-war camps, subsurface evidence of former landscape features, and urban farmsteads, mines, and house sites, as well as underwater types such as sunken ships, river crossings, and remains of piers and wharves. Not all sites were added to the map in Figure 14 due to the vast number and the ability to adequately symbolize those features in an organized fashion. Only those sites that are located within an FLA were chosen to represent a portion of Arkansas' cultural resources. It is estimated that 18% or 4,171 sites, have been recorded in a designated FLA.

• **Recreation**

Arkansas' natural beauty and abundant natural resources attract residents and visitors alike to participate in recreational uses, generating considerable revenue for the State. National forests, refuges, and wildlife management areas occupy nearly 3.3 million acres throughout the state. More than 9,000 miles of rivers and streams and 600,000 acres of lakes are found in Arkansas. The State is renowned for its bass fishing tournaments, world famous duck hunting, one of the largest concentrations of cave systems in the

country, and a large area of relatively intact bottomland hardwoods in the Lower Mississippi Alluvial Valley.

Non-consumptive uses such as hiking, boating, camping, bird watching, rock climbing, and caving are popular activities, as are consumptive uses such as fishing, small-game hunting, and waterfowl hunting. The 1995 Arkansas State Wide Comprehensive Recreation Plan (SCORP) reported that 1993 retail of outdoor recreation products, which includes expenses related to travel and equipment, in the State totaled \$246 million. Of that total, sales of products used for typical activities on Federal and State public lands included \$79.8 million for boating, \$52.1 million for hunting and fishing, \$13.4 million for mountain biking, \$11.9 million for walking, and \$5.5 million for camping. Figure 15 shows the total retail sales for outdoor recreation products in 1993.

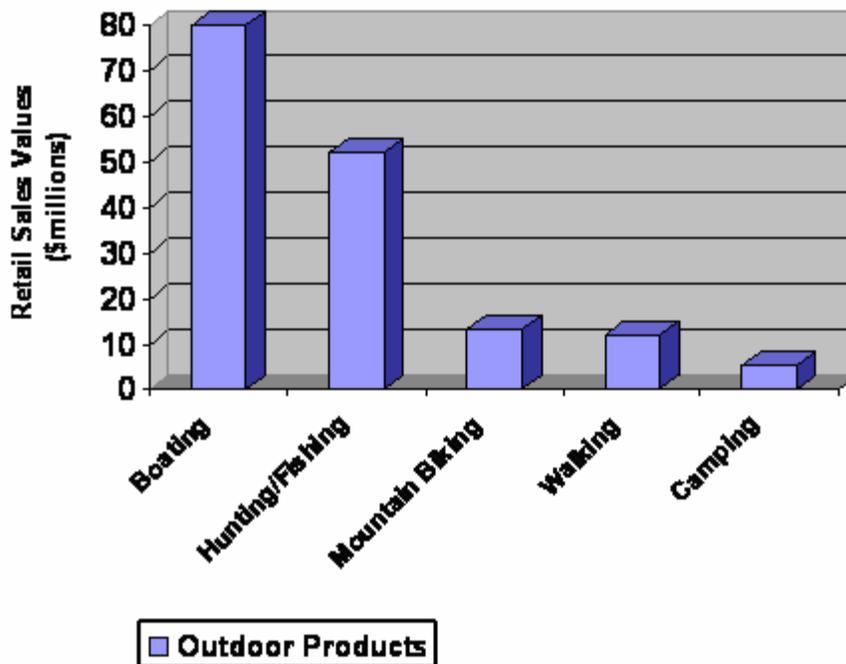


Figure 15

Hunting opportunities also abound for whitetail deer, elk, black bear, wild turkey, northern bobwhite, and numerous small game species. These opportunities generate considerable income to the state. In 1996 total expenditures for all wildlife-related recreation was estimated around 1.6 million dollars (Ozark Highlands Assessment, 1999). During the 2003-2004 hunting season there were 1.1 million hunting and fishing licenses sold generating over \$20 million in sales. The 1995 National Private Landowners Association (NPLOA) found that 47% of an average tract of private land is either completely closed to public use for recreation or is open only to leaseholders or available to family and friends of the landowner. Less than 8% of the private land was identified by owners as available for use by the general public; the trend is that access to private land is decreasing emphasizing the importance of public lands for meeting the demand for outdoor recreation.

All of these recreational uses directly or indirectly depend on protecting forests from conversion to non-forest conditions or incompatible forest uses.

5. THE NEED FOR FOREST LEGACY IN ARKANSAS

Threats to Arkansas' Forest Landscapes and Forest Resources

The Arkansas Forest Stewardship Committee recognizes the following threats to forestlands in Arkansas: fragmentation, parcelization, urban and exurban sprawl. These threats are interrelated and all lead to conversion to non-forest uses.

a. Fragmentation

Throughout the US, forest fragmentation has been a major concern of conservationists for many years, with areas of forests converted to farming, ranching, development and other non-forest uses leaving isolated patches of forest habitat. Fragmentation threatens forest land in three ways.

1. Breaks up the connectivity of forest land
2. Loss of forest canopy creates barriers for wildlife, isolating species to even smaller habitats and eventually causing decrease in population density
3. Causes loss of continuity and interrupts landscape-scale ecosystems

As trees are removed there is the potential for erosion and runoff into streams and other bodies of water. Groundwater recharge areas are no longer productive because of increased surface runoff and soil moisture evaporation which slow or diminish aquifer recharge potential.

b. Parcelization

Parcelization is the division of large tracts of forest into smaller tracts, which are in greater danger of conversion to non-forest uses. Private forest landowners own nearly 58% of the 18 million acres of forestland in Arkansas. The divestitures of land holdings by large timberland owners impact the expanse of forestlands in Arkansas. Often these land transfers extend ownerships to many, and each one has its own management strategy. Another factor driving forest parcelization in Arkansas is urban out-migration. Increases in real incomes caused increase demand for larger homes and more people moving to rural areas, where land is cheaper. Former urban residents are purchasing more rural lands for second home development and retirement homes. The trend towards larger home sites uses more forestland to shelter fewer people. Parcelization makes forestlands more susceptible to conversion to other uses.

c. Urban & Exurban Sprawl

Overall, the state's population grew from 1.92 million in 1970 to 2.75 million in 2004. Rather than being evenly distributed, this growth has concentrated in areas around central and northwestern Arkansas. In regions that are experiencing dramatic increases in human population, forestlands are being converted to related infrastructure, commercial and residential development. This trend is forecasted to accelerate with the addition of increased industrial development and interstate transportation routes.

Even in areas which are not growing in population, conversion of forest land is often occurring rapidly as a result of people in urban centers relocating beyond the suburbs. Arkansans are willing to accept a significant daily commute for the opportunity to live in lightly settled, less regulated locations, buffered from the direct influence of neighbors. Typical exurban homestead size is 10 to 100 acres. Such properties typically have a residence along with garden, pasture, and chicken house. These homesteads may often have a small woodlot, but such a small area provides few functions of larger contiguous forest. In a state like Arkansas with modest overall growth and few population centers, this form of sprawl impacts more area than typical suburban development.

Figure 16 shows the primary areas where populations are concentrated in the state.

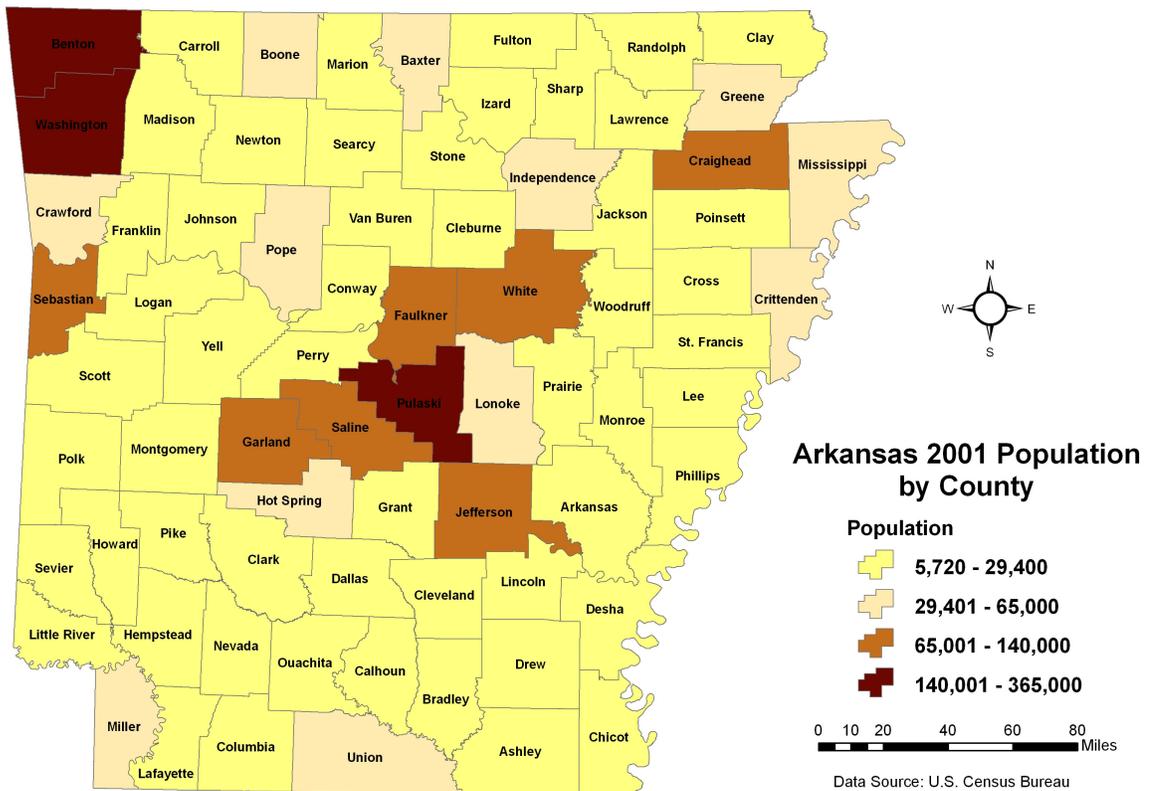


Figure 16

Figure 17 shows the population changes by county from 1990 to 2001 and FLAs.

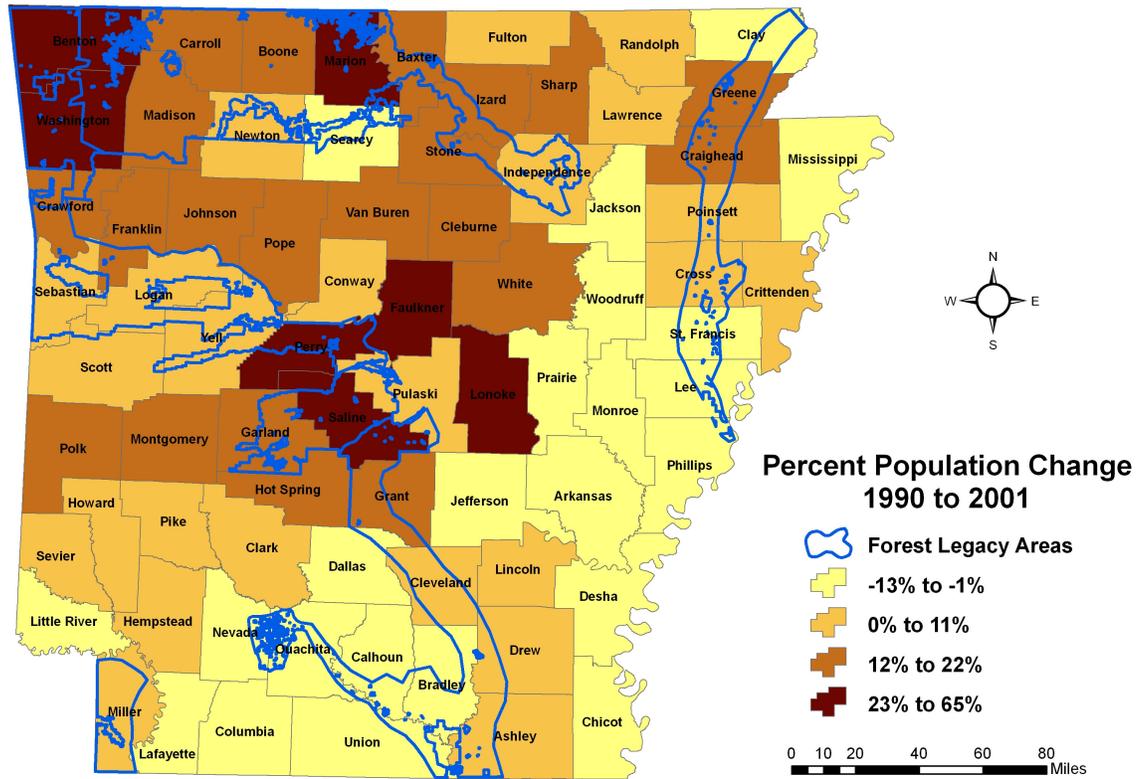


Figure 17

According to the U. S. Census Bureau, among the 50 states, Arkansas is projected to have 5th highest proportion of elderly in 2025. Figure 18 depicts the Projected Retirement Destination Counties (Demographic and Economic Profile Arkansas, Rural Policy Research Institute, USDA Economic Research Service, July 2006)

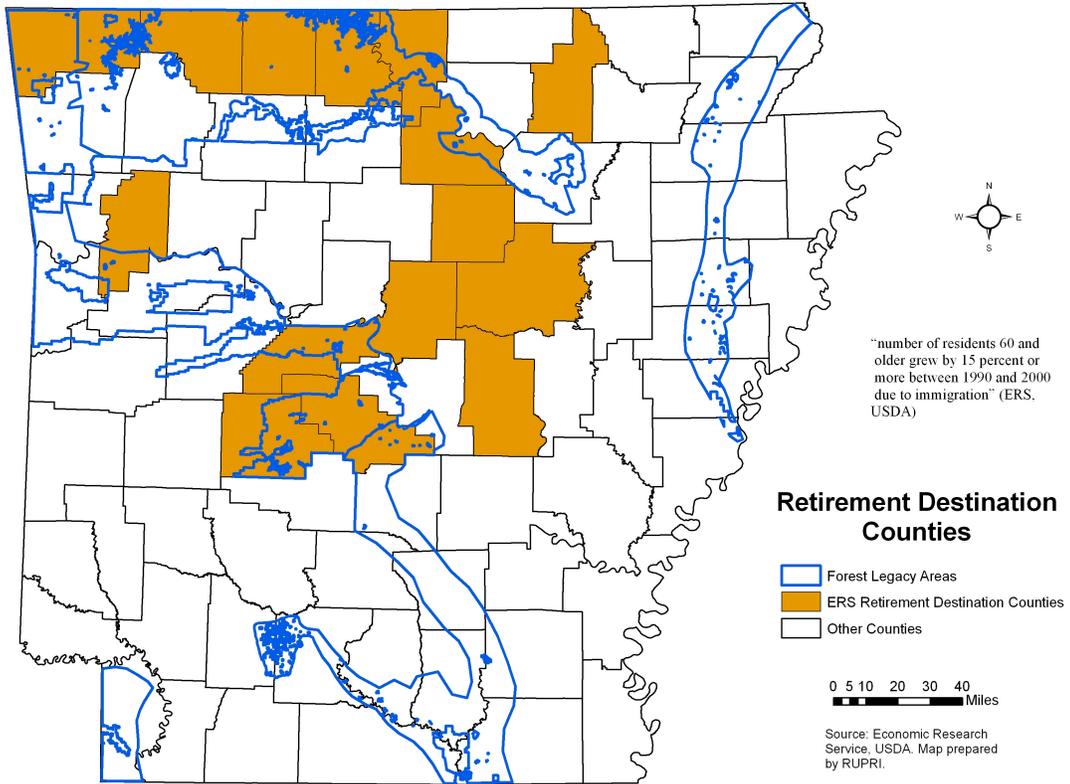


Figure 18

Figure 19 depicts the Projected Wildland Urban Interface in the year 2050 (Dr. Richard Kluender, UA Monticello).

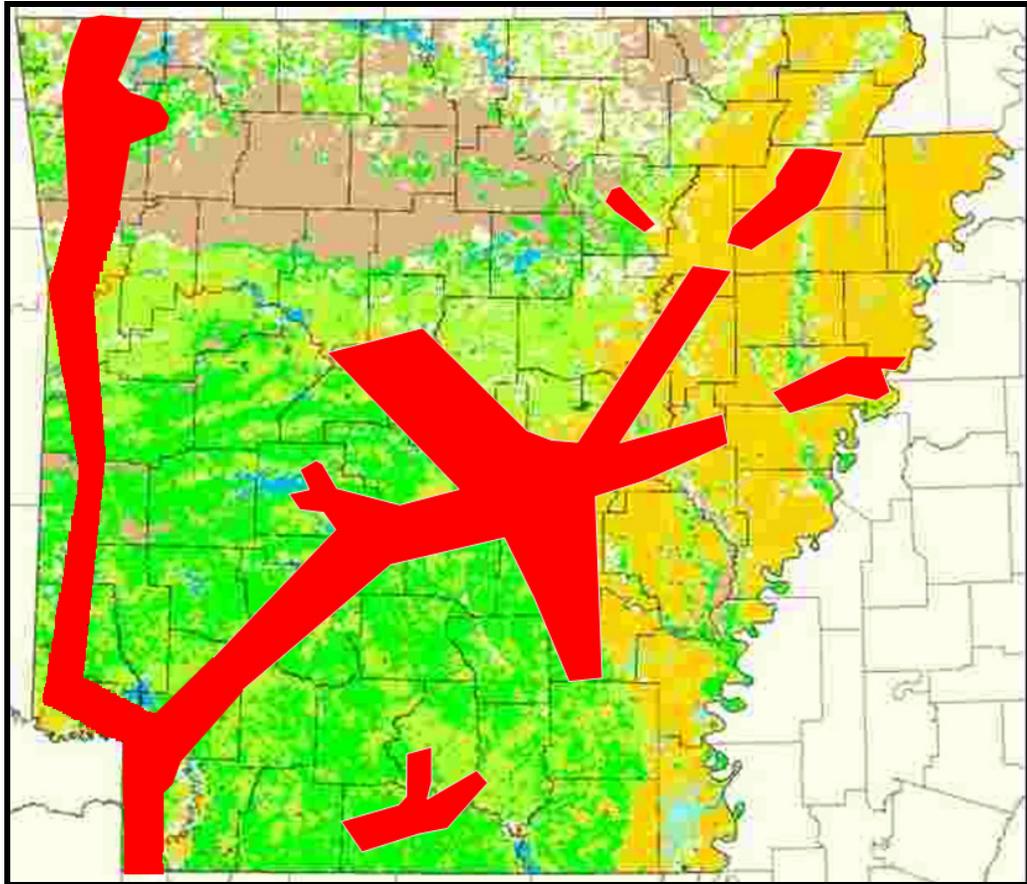


Figure 19

Figure 20 depicts the Projected Housing Density Change on private forests by the year 2030 (USDA Forest Service, Pacific Northwest Research Station, General Technical Report, PNW-GTR-636, May 2005).

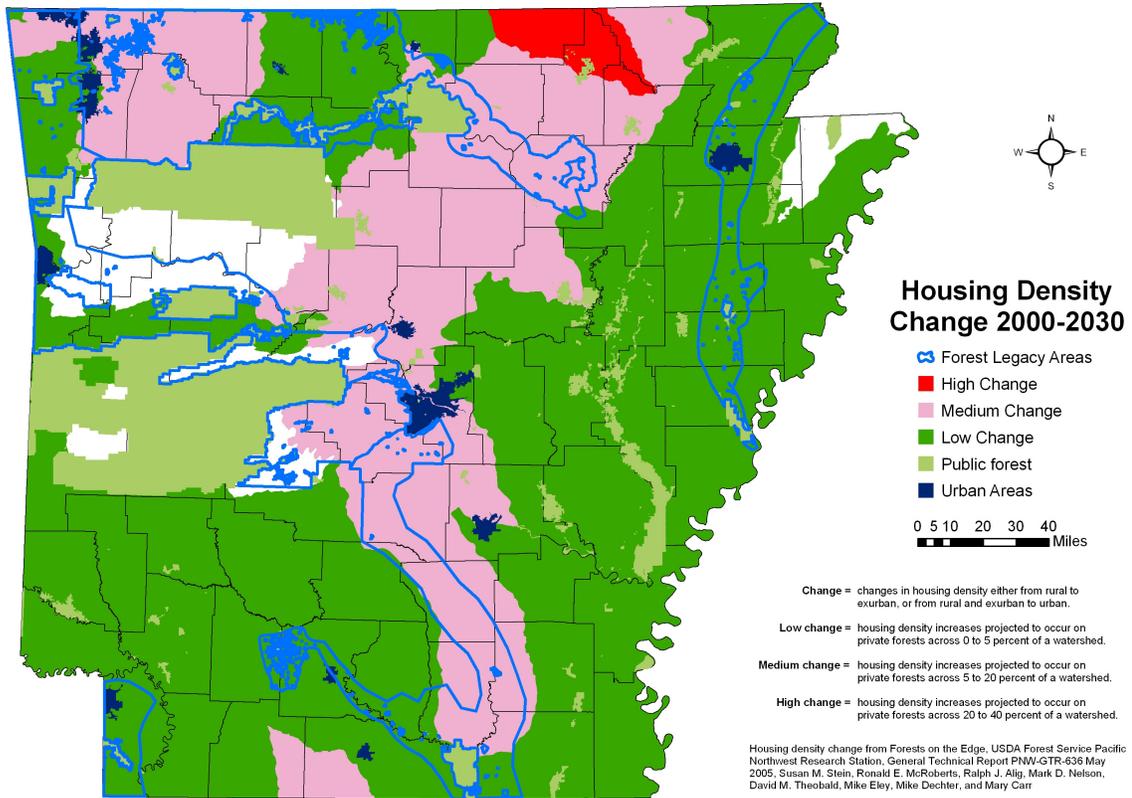


Figure 20

6. DESCRIPTION OF ECOREGIONS & THEIR CORRESPONDING FLAS

Arkansas' Forest Stewardship Committee adopted an ecoregional approach to planning and implementation of the Forest Legacy Program in Arkansas. Figure 21 illustrates the four main ecoregions used for organizing forest legacy planning in Arkansas. Implementation of the Forest Legacy Program will help sustain Arkansas' claim as "The Natural State" and be of great public benefit to all Arkansans now and for future generations.

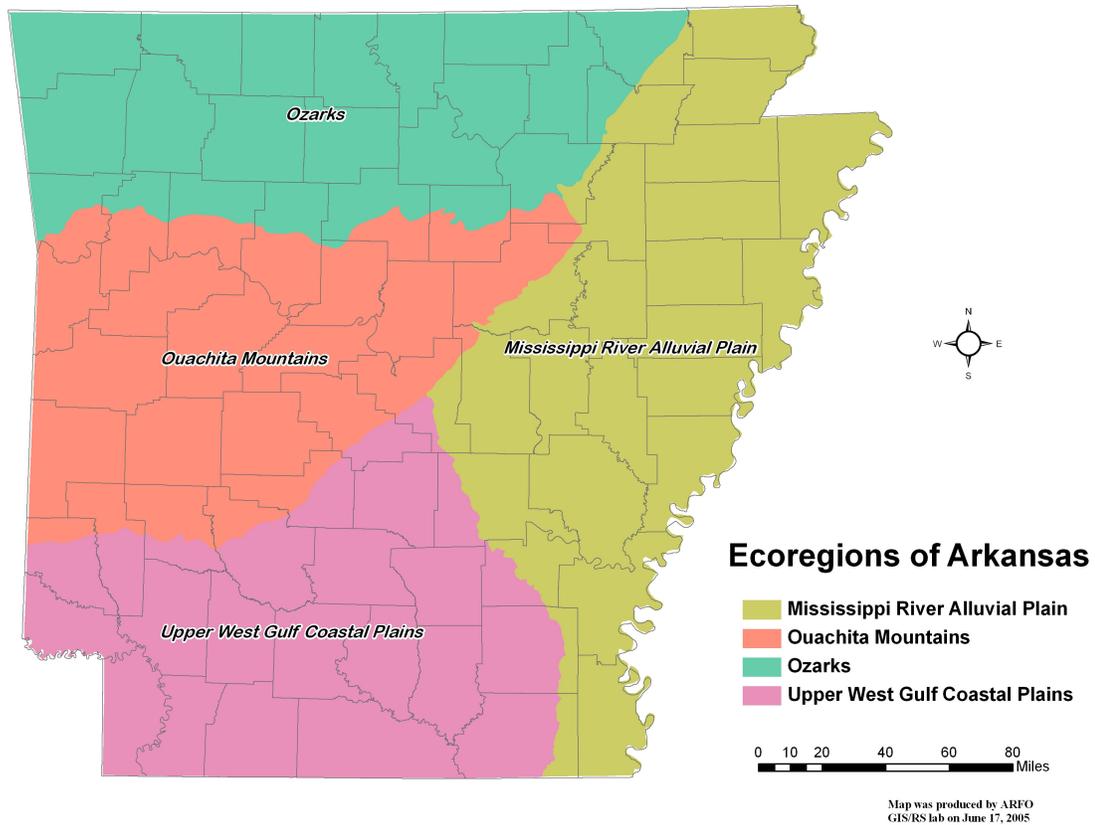


Figure 21

FOREST LEGACY AREA BOUNDARIES (FLAs)

Forest Legacy Areas were identified for each of the four major Ecoregions of the state. Forest values and their significant threats vary from one FLA to another. Each FLA was identified based on environmentally important working forest lands which have the values identified under the goal on page eight such as significant water resources, important aesthetics such as viewsheds, recreation resources, fish, wildlife, threatened and endangered species, and their associated threats (such as urban sprawl or fragmentation). Regardless of the particular value or relative threat to the identified FLAs, the Arkansas Forest Stewardship Committee recognized each as important to Arkansas' forest conservation efforts. The FLAs have been strategically located to complement important environmental or conservation areas already identified in the state. Figure 22 identifies the location of FLAs in the state, which covers less than 8.24 million acres total.

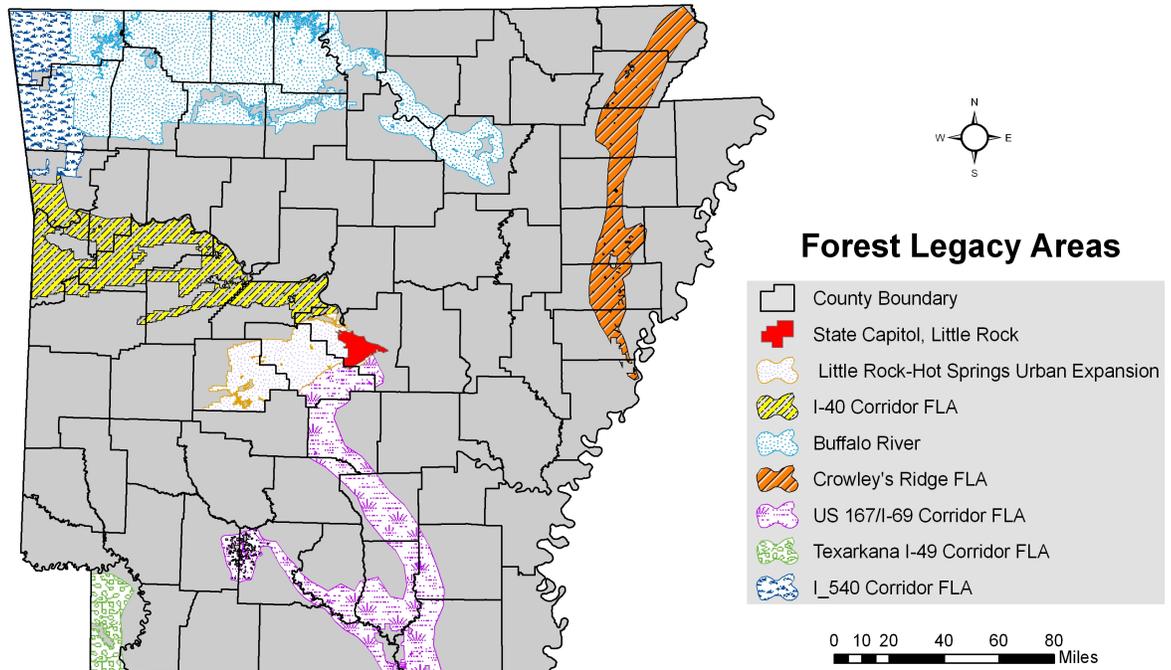


Figure 22

Ozark Mountains Ecoregion:

The Ozarks ecoregion is located in the northern and western parts of Arkansas, encompassing some 9.4 million acres. It is bounded by Missouri to the north and Oklahoma to the west. This ecoregion is characterized by a diversity of terrestrial, aquatic and karst (cave) habitats, ranging from glades and tall grass prairies, to coniferous and deciduous woodlands, as well as fens, sinkholes, sloughs, and a number of clear-flowing streams and rivers fed by an abundance of springs. It supports outstanding biodiversity resources, and is mostly covered with oak-hickory upland forests. Two exceptions are an area of increasing population and development in the northwest corner and north central areas of the state; in the north central area of the state, vacation/retirement property development acquisitions are rapidly increasing along waterfronts and where scenic and recreational resources are abundant.

Geologic attributes

High levels of topographic, geologic, soils and hydrologic diversity exist throughout the Ozarks, resulting in a wide range of habitat types. This is a region of rugged uplands with abundant exposed rocks and variable soil depths. The landscapes in various subsections of the Ozarks range from extensive areas of karst terrain on irregular plains, to highly dissected regions with steep hills and deeply entrenched valleys. There are also smaller, linear areas of alluvial terrain and large-scale riparian features

Biologic attributes

A major factor theorized by some to contribute to the region's notable biological diversity is that parts of the Ozarks have been habited by plants and animals for over 200 million years, constituting perhaps the oldest continuously exposed land mass in North America, and one of the oldest on earth. The Ozarks also constitute a center of endemism for temperate biota in divergent organism groups including vascular plants, lichens, fish, mollusks and crayfish.

Recreation

This region of the state offers a wide range of forest based activities that include mountain biking, hiking, camping, horseback riding, many forms of hunting, canoeing, swimming, and fishing. Other less obvious activities include collecting crystals, and a variety of mushrooms and other edible plants from the forest.

Aesthetics

North Central and Northwest Arkansas are one of the most scenic places in the state. It offers great scenery, abundant wildflowers, numerous fall festivals and craft fairs, and Arkansas' beautiful fall foliage. Expansive view sheds are plentiful throughout the Ozark Mountains which are accented by crystal clear waterways.

Forestland status

The Ozark Mountains Ecoregion is primarily forested (60%, 2003 FIA) with the exception of two counties in the extreme northwest corner of the state, where pasture and urban areas dominate.

Forest ownership

According to U.S. Forest Service Forest Inventory and Analysis (FIA) data, the Ozark Mountain forests were 19.8% publicly held, 3.1% forest industry held, and 77.1% private non-industrial held in 1988. In 2003 these percentages changed to 18.8% public, 2.6% industry, and 78.7% private non-industrial. The data indicates that Ozark forests are primarily held by private non-industrial owners. The private non-industrial ownership class is slowly growing. Although not presently documented, it is believed that the average parcel size of the Ozark private non-industrial ownership class is smaller than in other areas. The large majority of the public ownership lies in the Ozark National Forest and the Buffalo River National Park.

Census data and populations changes

Between 1990 and 2000, the Ozark region of the state experienced a population growth rate of 24.1%, reaching a total population of 641,386. This rate of growth continued through 2004, when population numbers totaled 693,215 or a 7.5% increase over the 2000 population.

Timber economy

The history of timber use in the Ozarks spans over one and a half centuries. For instance, as railways expanded across the Great Plains in the late 1800's, and as the barrel industry peaked from 1860-1930, white oak timber was targeted throughout this region to supply the staves and ties. Throughout the 1940's and 1950's "groundhog" sawmill operations represented a major economic contribution to the mountainous communities. Currently, sawmills remain scattered throughout this region providing crossties and lumber from the oak-dominated forests, but as production plateaus in southern portions of the state more emphasis on pine timber production and hardwood pulpwood production is being shifted to

this region. The effect of this emphasis is to shift oak-hickory stands and oak-pine stands to pine plantation.

Severance taxes collected for hardwood and pine harvested in these counties have been extracted from each county tax collector's report. Reports indicate how much wood has been harvested for whole counties. For those counties partially included in the ecoregion, data for the whole county has been included. Figure 23 graphs the tons of timber harvested subject to severance taxes for the Ozark Ecoregion.

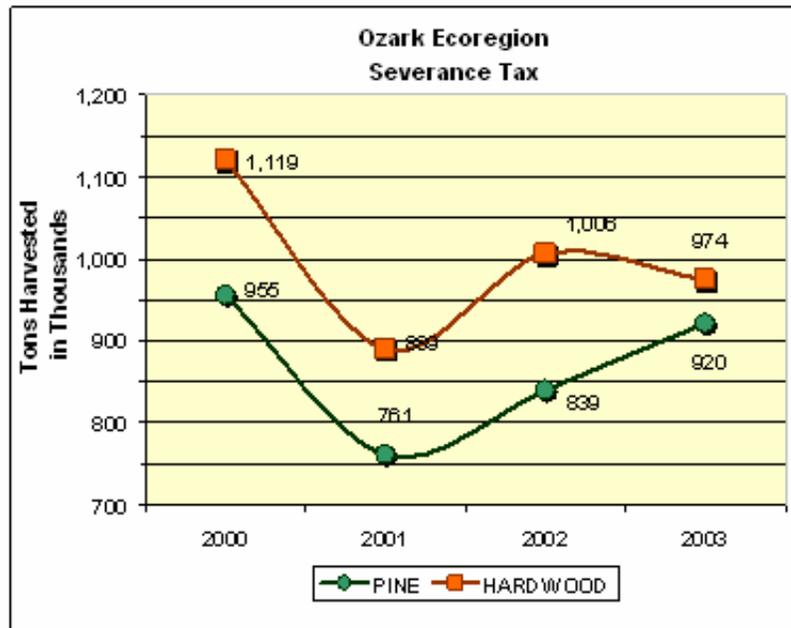


Figure 23

Of all of the ecoregions, the Ozark has the least timber harvested. This ecoregion contributes 13% to 18% of all the hardwood harvested in Arkansas, while about 5% of the pine for the State is harvested here. Figure 24 graphs the Ozark Ecoregion's percent of the total severance tax for the state for pine and hardwood.

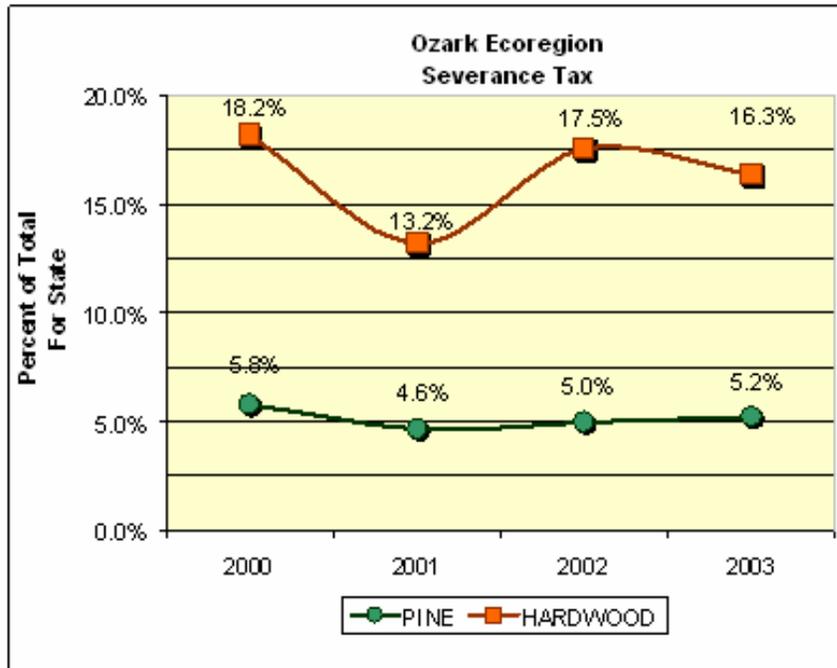


Figure 24

Most sawmills in this area are small. Approximately 130 primary wood-using plants were operating in this area in 2002, which is down from around 160 in 1999. Since 1999, saw-log production has increased 2% and pulpwood production increased 16%. Saw-logs account for 68% of the region's output.

Major threats to forestland acreage

Probably the greatest threat to Ozarks forests is the surge in population in Northwest and North Central Arkansas. Urban and exurban sprawl into previously forested lands outside the major communities is expected to continue to increase. This area of the state is in the path of a planned interstate highway (I-49) connecting New Orleans and Kansas City, increasing development along its route.

Northwest and North Central Arkansas are very attractive areas for retirement. According to the U. S. Census Bureau, among the 50 states, Arkansas is projected to have 5th highest proportion of elderly in 2025. Based on 2006 USDA demographics and economics research (see Figure 18), 9 out of the 15 Arkansas counties projected to be Retirement Destination Counties are in the Ozark Mountains Ecoregion. It is a popular area for tourism with its abundant outdoor recreation opportunities. Arkansas ranks among the top three poultry producing states in the United States. North Arkansas is the poultry hub for Arkansas with large processing facilities and a high density of poultry and egg production houses. Arkansas also ranks 17th among the beef cattle producing states. Eight of the State's top ten beef cattle producing counties are in the Ozark Ecoregion. Conversion of forestlands to pasture is a constant threat in North Arkansas.

The generational ownerships of Ozark forests have often resulted in "high-graded" stands having a higher proportion of less valued growing stock. Until now, there have been few

economic options to forest landowners for improving forest conditions. While available markets can be viewed as having a positive benefit for improving the quality of these forests, many landowners are electing to utilize the markets to convert their forestlands into pastureland and poultry production.

In the early 1990's this region experienced two outbreaks of gypsy moths, one in the Hardy area of Sharp County and one in the Compton area of Carroll, Newton, and Boone counties. As a result of quick actions by the state partners, both of these outbreaks were contained by aerial applications of approved insecticides on tens of thousands of acres. Through the State Plant Board, there is continual monitoring taking place to monitor this threat through trapping. According to state officials, the Ozarks region is the most likely point of entry for the next gypsy moth outbreak due to both tourism and human migration to the north.

In 1999, the state recorded an explosion in the red oak borer population from which almost a million acres of upland oak forests were negatively affected. Although the Ozark National Forest experienced the greatest forest mortality, private lands have also been affected.

**Ozark Mountains
I-540 Corridor - Forest Legacy Area**

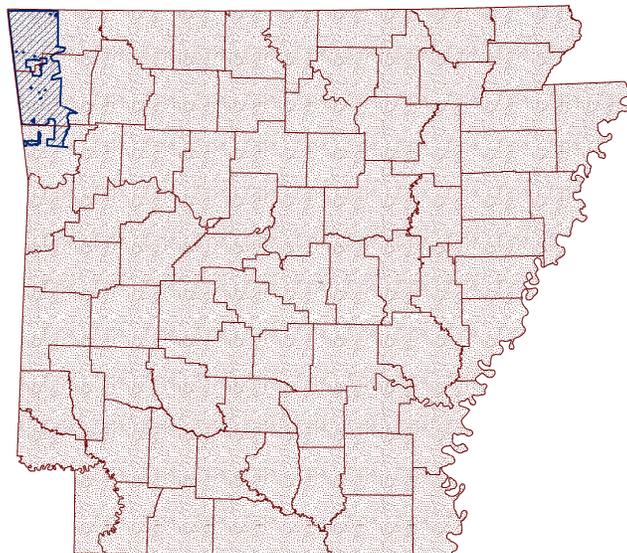


Figure 25

• **General description**

The I-540 Corridor FLA includes parts of Crawford, Washington and Benton counties, and is located in both the Ozark Highlands and Boston Mountains sections of the Ozarks ecoregion. Figure 25 depicts the I-540 Corridor. The northern boundary of the FLA ends at the Missouri State line to the north and at the Oklahoma State line to the west, and encompasses approximately 657,639 total acres and an estimated 228,240 forested acres. This area is underlain by calcareous limestone which is dissolved by acid water, forming solution caves under ground and solution features at the surface such as

sinkholes and disappearing streams. Water moves from these surface features into the caves which may harbor endangered species and/or serve as water sources for rural populations. Landscapes with these features are referred to as karst. The FLA has karst and aquatic conservation values along Spavinaw Creek; and terrestrial and karst landscape conservation values at Garrett Hollow. A number of very important karst conservation areas are also included, associated with the Springfield and White River karst areas of the Ozarks.

As a part of the revised forest plan of the Ozark National Forest, the US Forest Service's Wedington Unit, just outside Fayetteville, is planned to be managed as an "urban forest" in keeping with current US Forest Service urban-interface planning guidelines. This forested acreage is essential towards providing the increase in outdoor recreational opportunities needed in this portion of the state. It will also serve as a conservation education center for the expanding population, along with the Hobbs State Park Conservation Area.

- **Why this area was chosen as an FLA**

The I-540 Corridor FLA is chosen for its connection to the Wedington Unit of the Ozark National Forest in order to expand the USFS plan for urban forestry. The FLA has important oak/hickory forests under heavy development pressure. The I-540 Corridor FLA includes the western portion of the Illinois River Watershed. Figure 6a shows the Arkansas Priority Watersheds and the I-540 Corridor FLA. The Illinois River Watershed is threatened by sediment due to construction from the rapid urban development in Washington and Benton counties. Agricultural activity is causing the introduction of animal waste into streams that is affecting aquatic life as well as human health. These forests are needed as karst water recharge areas, to protect water quality, for recreation value, for wildlife value, and education purposes

- **FLA Priority Strategies (ranked)**

1. Protect forested karst recharge watersheds from development
2. Protect forested riparian zones especially in the Illinois River Watershed from conversion to agriculture and residential development.
3. Enlarge and solidify protection within and adjacent to publicly owned areas through fee acquisition and easements.

- **Forested attributes**

A suite of cave systems in the I-540 Corridor FLA harbor several globally imperiled species, including cave crayfish, Ozark big-eared bat, and Ozark cavefish, as well as many related conservation targets of global significance. These systems were identified during the Ozark ecoregional assessment conducted by many agencies under the leadership of The Nature Conservancy.

The I-540 Corridor FLA is primarily oak/hickory forests interspersed with pastureland and small streams. The forests in the FLA are fragmented remnants of the forest cover found in the time of European settlement.

- **Ownership**

Identified karst concentrations include Bentonville (4,530 acres, no public lands), and Bella Vista (on the Missouri State line, 1,500 acres in Arkansas, no public lands). Devil's

Den karst is 5,090 acres, of which 2,035 acres are included in Devil's Den State Park. Spavinaw Creek (on the Oklahoma State line, 1,500 acres in Arkansas, no public lands) has karst and aquatic conservation values, including some 15 aquatic species.

Garrett Hollow is a landscape conservation area on the western edge of the Boston Mountains, principally in the Ozark National Forest, with additional public ownership at Devils Den State Park.

The Cave Springs karst area is the most ecologically important of the karst areas delineated in the FLA. It comprises 44,000 acres west of Springdale with extensive subterranean aquatic habitats and many globally rare species. This karst area is almost all in private ownership, with small publicly owned lands near the entrances of Cave Springs (Arkansas Natural Heritage Commission) and Logan (USDI Fish and Wildlife Service) caves. Much of the upland recharge area for the Cave Springs karst system is grazed pasture and developing rural residential neighborhoods that threaten underground water quality.

- **Threats**

The greatest threat to this FLA is the surge in population being experienced in northwest Arkansas. Urban and exurban sprawl into previously forested lands outside the major communities is expected to continue current expansion rates. Along with urban sprawl, parcelization and fragmentation will continue to threaten natural resources and pressure existing landowners to develop forested land. This development will increase losses of forest values such as access to outdoor recreation areas, wildlife habitat, water quality, and biodiversity.

- **Solutions**

1. Prioritize the purchase of both fee title and conservation easements of lands adjacent to the Wedington Unit of the Ozark National Forest and other public properties within the FLA to further protect forest from conversion.
2. Prioritize the purchase of conservation easements within the riparian corridors of the White River, the Illinois River Watershed, and other major streams, ensuring against forestland conversions.
3. Purchase conservation easements on private lands that contain known cave structures, sinkholes, and other openings to groundwater recharge.

**Ozark Mountains
Buffalo River - Forest Legacy Area**

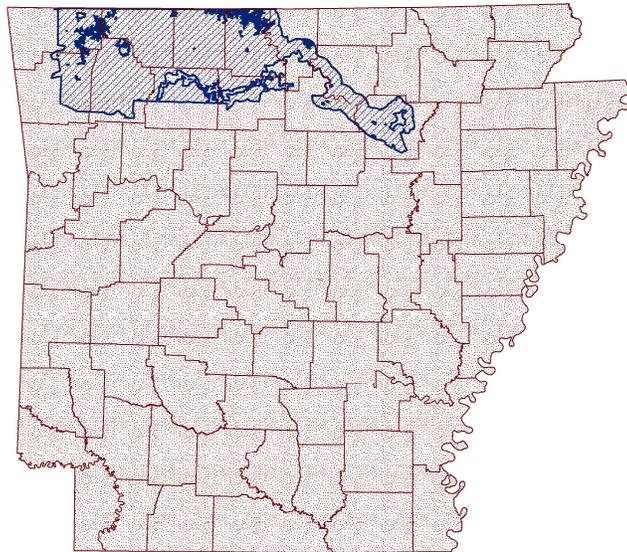


Figure 26

- **General description**

The Buffalo River FLA includes parts of Baxter, Benton, Boone, Carroll, Madison, Marion, Newton, Stone, Searcy, and Washington counties, and is located in both the Ozark and Boston Mountains sections of the Ozarks Ecoregion. Figure 26 depicts the Buffalo River FLA. The northern boundary of the FLA ends at the Missouri State line to the north and at the I-540 Corridor FLA boundary to the west. The Buffalo River FLA encompasses approximately 2,940,161 total acres and an estimated 1,645,036 forested acres.

Approximately 48% of the Ozark karst ecological system within Arkansas is contained in the FLA. This area is underlain by calcareous limestone which is dissolved by acid water, forming solution caves under ground and solution features at the surface such as sinkholes and disappearing streams. Water moves from these surface features into the caves which may harbor endangered species and/or serve as water sources for rural populations. Landscapes with these features are referred to as karst. A number of very important potential karst conservation areas are included in the FLA. The FLA has scenic and aquatic conservation values along the Buffalo River National Park, Buffalo National Wilderness Area, and the Kings River. The Highway 7 State Scenic Byway is enclosed in the FLA and runs north from the Ozark National Forest, through the Buffalo River National Park ending in Harrison, AR. Beaver Lake supplies water for the Fayetteville, Springdale, Rogers, and Bentonville metropolitan area, the fastest growing population center in Arkansas.

- **Why this area was chosen as an FLA**

The Buffalo River FLA is chosen for its connection to the Ozark National Forest, Buffalo River National Park, Buffalo River National Wilderness Area, State Wildlife Management

Areas, and State Parks. Protecting the forests ensure that quality drinking water will be available for residents of North Arkansas, Eastern Oklahoma, and Southern Missouri. The Buffalo River FLA encompasses the Beaver Reservoir Watershed and the eastern portion of the Illinois River Watershed. Figure 6a shows the Arkansas Priority Watersheds and the Buffalo River FLA. The Beaver Reservoir and Illinois River Watersheds are threatened by sediment due to construction from the rapid urban development in Washington and Benton counties. Agricultural activity is causing the introduction of animal waste into streams that is affecting aquatic life as well as human health.

The FLA encompasses a large portion of the State's Extraordinary Resource Waters (ERW). Refer to Figure 7 to see a map of the ERW's. The ERW designation protects a water body by recognizing its distinct combination of chemical, physical, and biological attributes characterized by scenic beauty, aesthetics, scientific values, recreation potential and intangible social values. The FLA encloses a significant portion of the Areas of Significant Biodiversity as designated by the Arkansas Natural Heritage Commission shown in Figure 10. The areas enclosed are significant for both aquatic and terrestrial biodiversity.

The FLA has important oak/hickory forests under heavy development pressure from residential and agricultural lands expansion. The forests are needed as karst water recharge areas, for recreation value, to protect public drinking water supplies, to protect extraordinary waters, to protect priority watersheds, for wildlife value, to protect national and state designated scenic areas, and to secure habitat for endangered species.

- **FLA Priority Strategies (ranked)**

1. Protect priority watersheds that are critical for public drinking water supplies and aquatic life.
2. Protect the scenic National River and scenic state byway for public use.
3. Protect forested karst recharge watersheds from development.
4. Protect forested riparian zones from conversion to non-forest agriculture uses.
5. Enlarge and solidify protection within and adjacent to publicly owned areas through fee acquisition and easements.

- **Forested attributes**

Two important karst ecological sites are the Bear Hollow Cave and the Smith Creek Nature Preserve which protects Sherfield Cave. Sherfield Cave is where the largest colony of the federally endangered Indiana bats in the state, hibernate each winter. A suite of cave systems in the Buffalo River FLA harbor several globally imperiled species, including cave crayfish, Ozark big-eared bat, and Ozark cavefish, as well as many related conservation targets of global significance. These systems were identified during the Ozark ecoregional assessment conducted by several agencies under the leadership of The Nature Conservancy.

The Buffalo River FLA is primarily oak/hickory forests interspersed with pastureland and small streams. The forests in the FLA are fragmented remnants of the forest cover found in the time of European settlement.

- **Ownership**

According to the 2005 FIA data, 6% was held by forest industry and 87% was in private non-industrial ownership. Public forest lands enclosed but not included in the FLA make up 7% of the ownership and are the Buffalo National River, Pea Ridge National Military Park, Bull Shoals and Ozark Folk Center state parks, Baker Prairie Natural Area (NA), Bear Hollow NA, Devil's Knob-Devil's Backbone NA, Hell Creek NA, Kings River Falls NA, Searless Prairie NA, Slippery Hollow NA, Sweden Creek Falls NA, Gene Rush Buffalo River Wildlife Management Area (WMA), Hobbs WMA, Loafers Glory WMA, and Madison County WMA. Natural Areas are properties of the Arkansas Natural Heritage Commission and Wildlife Management Areas are properties of the Arkansas Game & Fish Commission.

- **Threats**

The greatest threat to this FLA is the surge in population being experienced and projected for north Arkansas. Urban and exurban sprawl into previously forested lands outside the major communities is expected to continue to increase. Along with urban sprawl, beef cattle and poultry production, parcelization, and fragmentation will continue to threaten natural resources and pressure existing landowners to develop forested land. This development will increase losses of forest values such as access to outdoor recreation areas, wildlife habitat, water quality, and biodiversity.

- **Solutions**

1. Prioritize the purchase of both fee title and conservation easements of lands adjacent to the Buffalo National River, Buffalo National Wilderness, Ozark National Forest, the Highway 7 State Scenic Byway, and other public properties within the FLA to further protect forest from conversion.
2. Prioritize the purchase of conservation easements within the riparian corridors of the Illinois River and Beaver Reservoir Watersheds, Extraordinary Resource Waters, and other major streams, ensuring protection against forestland conversions.
3. Purchase conservation easements on private lands that contain known cave structures, sinkholes, and other openings to groundwater recharge.

Upper West Gulf Coastal Plain Ecoregion (UWGCP):

The Upper West Gulf Coastal Plain (UWGCP) ecoregion is located in the southern and western parts of Arkansas, encompassing some 8.3 million acres. It is bounded by Louisiana to the south, Oklahoma and Texas to the west, the Ouachita Mountains to the north and the Mississippi Alluvial Plain to the east. This ecoregion is characterized by a diversity of terrestrial and aquatic habitats, dominated by pine-hardwood forests and woodlands on rolling hills and flat Pleistocene terraces, bottomland hardwood forests and cypress swamps along watercourses, and tall grass prairies, saline soil barrens, blackland prairies and groundwater seepage communities in specific physical settings. Streams and rivers are generally of moderate or better water quality as a result of forested watersheds and have relatively wide bottomlands. The UWGCP has outstanding biodiversity, wildlife habitat, soils, and high growth forests.

This ecoregion is characterized as a landscape of gently rolling hills and slow-moving rivers and streams. The streams and bayous support outstanding aquatic biodiversity, including

several species that are only found here. Pine and pine-oak woodlands are the forests that are mostly commercial forestland. Parcelization is occurring as populations around the metropolitan areas of Little Rock and Texarkana move into the surrounding countryside.

Geologic attributes

In the UWGCP, topographic, geologic, soil and hydrologic diversity result in a wide range of habitat types. The typical character of the region is rolling hills formed in Tertiary marine and near-shore deposits of the Gulf of Mexico. These hills are typically sandy, but with silt, clay and gravel common. Areas with deep, excessively drained sands are distinguished as “sandhills”. Small areas of sandstone or calcareous clays occur. Cretaceous hills of sand or gravel occur in the extreme northwestern part of the ecoregion. Belts of Cretaceous chalk, limestone or marl (calcareous clay) create the Blacklands, related to the Blackland Prairies of Texas and the Black Belt of Mississippi and Alabama. Streams vary from small sandy headwaters streams to moderate-sized rivers with long-duration flooding and a few large rivers, most prominently the Ouachita and Red rivers. All have relatively wide alluvial floodplains because of the relative ease of reshaping the unconsolidated sediments that form the substrate. Large areas of Quaternary (Pleistocene) terraces form flats, intermediate in character between the Holocene floodplains and the Tertiary or Cretaceous hills. These flats are usually above current floodplains but typically have a dense subsoil and poor internal and surface drainage, leading to substantially different ecosystem characteristics.

Biologic attributes

Terrestrial systems in the UWGCP include both mesic to hydric bottomlands and upland dry-mesic and hydric areas. Bottomlands are dominated by hardwood communities, primarily oak species, and more deeply flooded areas frequently have cypress and cypress-tupelo swamp vegetation. Upland areas are dominated by shortleaf and loblolly pines and mixed pine-hardwood communities with various glades sandhills and woodlands. Local geology and soils conditions provide small patch diversity, supporting many globally significant plant communities. The Blackland region is dominated by woodlands, forests, and small prairies associated with calcareous substrates. These are examples of small patch communities of global importance, which are very critical for conservation of Arkansas’ diversity.

Sandhills woodlands, and barrens associated with deep, sandy soils also add community and species diversity to the UWGCP in Arkansas. Flatwoods on Pleistocene terraces are dominated by loblolly pine and hardwoods. These communities are different from upland pine-hardwood communities by being wetter, having a different fire regime, and greater dominance of loblolly pine relative to shortleaf pine.

Aquatic habitats in the UWGCP include low-slope, medium-to-high order streams and riverine systems. Streams are sheet, surface, and groundwater fed. Larger rivers that originate in Arkansas’ Ouachita ecoregion flow through the UWGCP and are home to diverse mussel and fish communities. Rivers are the predominant aquatic system in the UWGCP, and contain a diverse assembly of mussels and fish. Substrates range from gravel, sand-gravel, to mud and silt.

The UWGCP is home to 15 endemic species and 59 species with limited ranges. Six federally listed endangered species and two listed threatened species occur in the

ecoregion. Many of the endemic species are crayfishes and mussels. There are at least 10 terrestrial plant communities endemic to the ecoregion.

Forestland status

Much of the UWGCP is forested, with most of that under commercial management by the timber industry. Additional uses include grazing and agriculture. Habitat fragmentation caused by urban growth and suburban sprawl occurs throughout the region. Following the national trend, urban and suburban land uses are increasing, though not as intensely as in other ecoregions.

Forest ownership

According to U.S. Forest Service Forest Inventory and Analysis (FIA) data, the UWGCP region was 2.6% publicly held, 50.6% forest industry held, and 46.8% private non-industrial held in 1988. In 2003 these percentages changed to 3.5% public, 45.3% industry, and 51.1% private non-industrial. The data indicates that in 1988 UWGCP forests were slightly more than half owned by forest industry. Currently, industry owners are selling lands to the two other sectors making private non-industrial owners the largest ownership class. For decades the forest products industry has dominated ownership and management of the UWGCP forests.

Most of the 4.5 million acres owned by industry in Arkansas is concentrated in the Coastal Plain where soils are productive and growing seasons are long. At the regional scale, these industrial forestlands provide important connectivity and habitat. Additionally, because of the close proximity of large industrial mills and industrial influence, private lands in this region have exhibited the same forestry driven structure. From a forest products standpoint, this region represents the "bread basket" of Arkansas. Programs like the Tree Farm program have been very popular among private forest owners since the investment and marketability is so tied to the availability of industry. Public ownership remains a very small percentage and influence in this ecoregion.

Census data and populations changes

Between 1990 and 2000, this area of the state experienced a population growth rate of 6.1%, reaching a total population of 522,016. The population in 2004 remained relatively constant at 524,204, which is a 0.4% increase.

Timber economy

Severance taxes collected for hardwood and pine harvested in these counties have been extracted from each county tax collector's report. Reports indicate how much wood has been harvested for whole counties. For those counties partially included in the ecoregion, data for the whole county has been included. Figure 27 graphs the tons of timber harvested subject to severance taxes for the UWGCP Ecoregion.

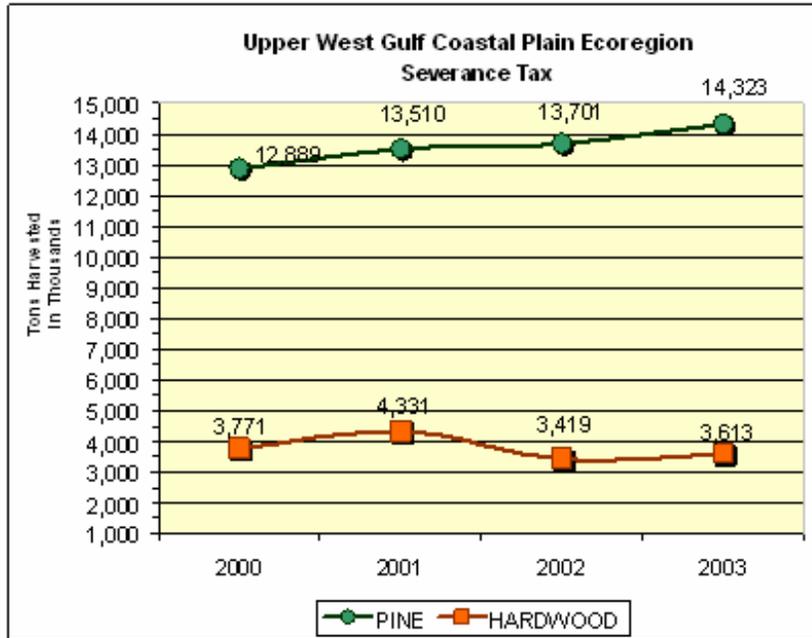


Figure 27

Far and away, timber industry has its largest presence in this ecoregion. Approximately, 60% of all the hardwood and 80% of the pine harvested in Arkansas is harvested here. Figure 28 graphs the UWGCP Ecoregion's percent of the total severance tax for the state for pine and hardwood.

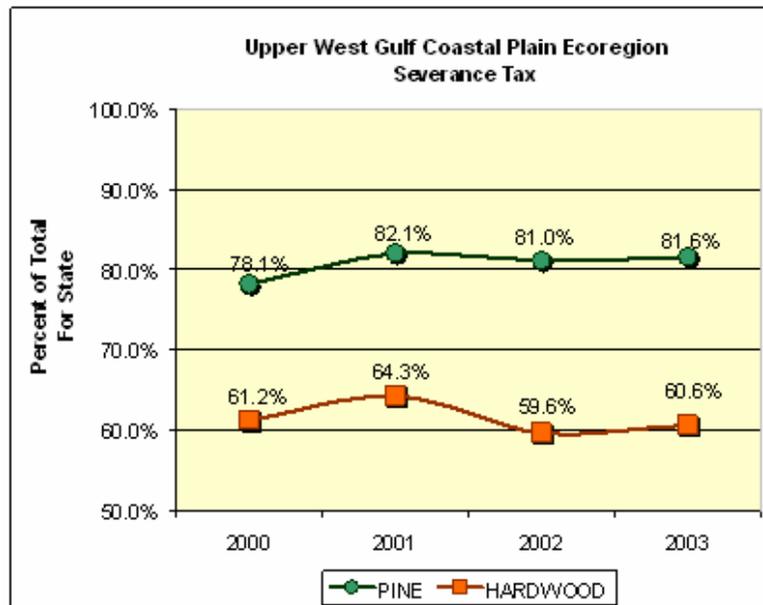


Figure 28

Sawmills and paper mills in the area are usually very large facilities. Approximately, 75 primary wood-using plants were operating in this area in 2002 which is down slightly from

about 85 in 1999. Since 1999 saw-log production has increased 10 % and pulpwood production decreased 29 %. Saw-logs account for 47% of the region's output and 66% of the State's saw-log production.

Major threats to forestland

The primary threat to forests of the UWGCP is that private landowners, both corporate and non-corporate, are selling forest lands as they become more valuable for development. If these lands are located near active real estate markets there is a tendency for industry to sell in order to maximize company profits (Luloff, 2000). Timber Investment Management Organizations (TIMOs) are buying and managing timberland for pension and investments funds with a high rate of turnover of property, since their interests are primarily financially based (Sampson, 2000). Moreover, small private investors are acquiring industrial lands in blocks of a few hundred to a few thousand acres. These investors are reselling the land in very small parcels (often 10 to 20 acres) to exurban owners who will convert part of the land to pasture, small crop farms, and home-sites. Thus, the threat is parcelization, fragmentation, and conversion to non-forest uses.

For example, Georgia Pacific Corporation divested its entire forest land holdings, which included over a million acres in Arkansas, into a Real Estate Investment Trust (REIT), Plum Creek Timber Company, which has recently sold 60,000 acres which is being re-sold in small tracts. More recently Anderson-Tully Company announced the sale of their assets, with approximately 350,000 acres of timber land within a three state area, to a TIMO, Forestland Investment Group, and International Paper Company announced the restructuring of their assets which includes divestiture of all their remaining timber land which includes about 700,000 acres in Arkansas after previously divesting approximately 1 million acres.

The remaining forests in the UWGCP are stressed by wildlife habitat destruction and conversion, as well as fragmentation and alteration of natural fire regimes. These stresses are caused by improper forestry practices and fire suppression. Aquatic systems are stressed by incompatible land use practices leading to sedimentation and runoff, and non-point source pollution.

Upper West Gulf Coastal Plain Texarkana I-49 Corridor - Forest Legacy Area

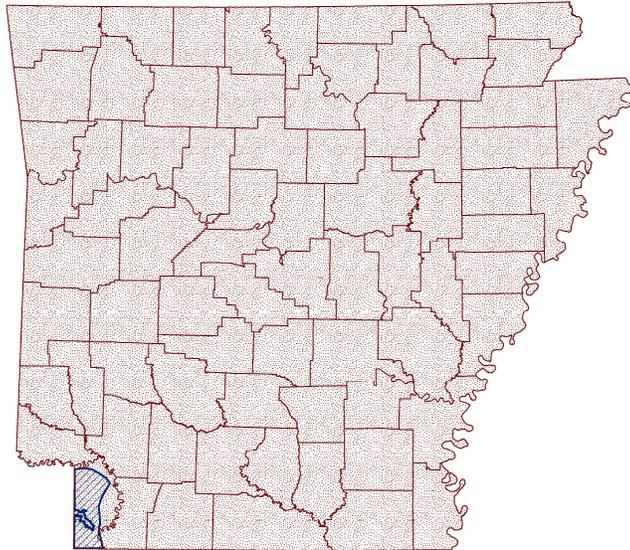


Figure 29

- **General description**

Texarkana I-49 Corridor Forest Legacy Area is located in extreme southwestern Arkansas between the Red River bottomlands on the east and north, the Texas state line on the west, and the Louisiana state line on the south. Figure 29 shows the Texarkana I-49 Corridor Forest Legacy Area. It encompasses 249,916 total acres which are about half forested or approximately 123,306 forested acres.

- **Why this area was chosen as an FLA**

This FLA was chosen because of its unique plant communities, biodiversity, outstanding terrestrial and wetland conservation values, outdoor recreation opportunities, and timber production, among those listed on page 8. The FLA includes the Sulphur River and its associated hardwood bottomlands as well as the city of Texarkana. The close proximity to a metropolitan area and the fact that this area supports a wide range of wildlife game species, make it a popular region for outdoor recreation. Therefore, Texarkana I-49 Corridor FLA was chosen to protect these environmental, economic, and social values.

- **FLA Priority Strategies (ranked)**

1. Protect at landscape scale, best examples of deep sandy soil forests from conversion to suburban and exurban development or pasture.
2. Buffer and connect larger protected ownerships, if possible.

- **Forested attributes**

The dominant land cover for this FLA is upland pine-hardwood forests and woodlands. Areas of deep excessively well-drained sand are dominated by sandhill woodlands with tree species such as bluejack oak, margaretta oak, and shortleaf pine. Typically these

hardwoods are stunted at less than thirty feet tall. A diverse herbaceous understory occupies the ground layer. Along the Sulfur River is a wide bottomland with extensive stands of swamp privet and water elm along with some bottomland hardwood and cypress swamps.

- **Ownership**

Texarkana I-49 Corridor FLA is primarily held by private non-industrial owners (83%, FIA). However, forest industry has some ownership. Two publicly held areas enclosed but not included in the FLA are the Sulphur River WMA, owned by the Arkansas Game & Fish Commission, and Miller County Sandhill Natural Area, owned by the Arkansas Natural Heritage Commission and The Nature Conservancy.

- **Threats**

The conversion of forests to residential, pasture, and other developed areas has occurred for decades in this FLA. The ecological effects of fragmentation, which is accelerating, threaten remaining forested areas. As I-49 is completed through this area associated commercial and residential development will increase still further and threaten remaining forested areas. The sandhill communities depend on fire to maintain their species diversity and structure, along with wildlife habitat. Fire in sandhill barrens and open woodlands has been suppressed in the past century due to safety concerns within the wildland urban interface and this trend will continue.

- **Solutions**

- 1.) Protect forests threatened by conversion to pasture and exurban/suburban development, using easements or acquisitions.
- 2.) Expand and, if possible, connect publicly owned landholdings.

**Upper West Gulf Coastal Plain
US 167/I-69 Corridor – Forest Legacy Area**

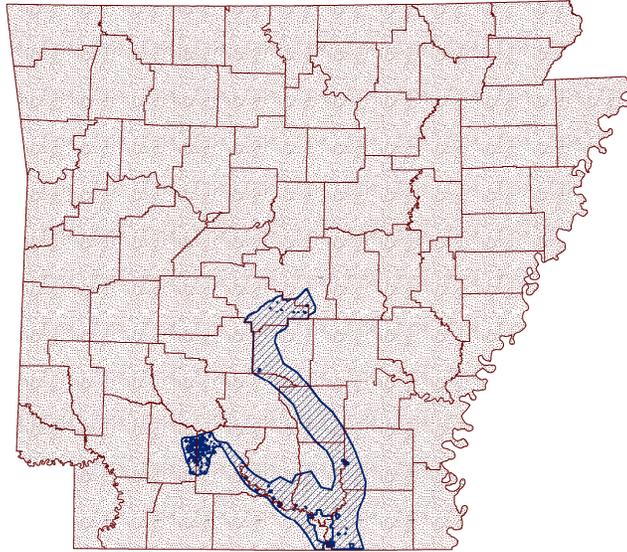


Figure 30

- **General description**

The US 167/I-69 Corridor FLA is located in the southeastern part of Arkansas' Upper West Gulf Coastal Plain ecoregion. Figure 30 depicts the US 167/I-69 Corridor FLA. It includes reaches of the Ouachita and Saline rivers, and the associated Pleistocene terraces along both rivers. The FLA includes parts of Saline, Grant, Hot Spring, Dallas, Cleveland, Calhoun, Bradley, Drew, Ashley, Ouachita, and Union counties. Several cities and towns (El Dorado, Camden, Benton, and Little Rock) are close by, but only Crossett is in the FLA. The FLA ends at the Louisiana state line, and encompasses approximately 1,559,551 acres with an estimated 1,359,551 forested acres.

- **Why this area was chosen as an FLA**

This area was chosen as an FLA because it supports exceptional aquatic and terrestrial forest conservation values as listed on page 8. The Saline River has been designated by the Arkansas Department of Environmental Quality as an Extraordinary Resource Water. It contains the last and largest stands of Loblolly/Shortleaf pine dominated flatwoods (a very unique plant community). Red-cockaded Woodpeckers occur within and use the area. The Audubon Society has identified much of the FLA as an Important Bird Area (IBA) and The Nature Conservancy has identified the FLA as part of a key conservation area in the UWGCP ecoregion.

This FLA is legendary in Arkansas and surrounding states for its timber production and hunting. Much of the FLA is a moderate to high potential aquifer recharge area. The FLA is contiguous with one other FLA: Little Rock-Hot Springs Urban Expansion.

- **FLA Priority Strategies (ranked)**

1. Protect at landscape scale best examples of Ouachita terrace forests and wetlands including Pine/Oak flatwoods from conversion to exurban homesteads consisting of pastures, small farm crops, chicken houses, home sites and other non-forest uses.
2. Provide additional public access opportunities for outdoor recreation.

- **Forested attributes**

The US 167/I-69 FLA is still largely forested and undisturbed hydrologically, and its ecosystem functions are relatively intact. This landscape complex includes big rivers (the Ouachita and Saline), bottomland hardwood forests, terrace pine-hardwood forests and upland pine-oak woodlands and pine-grass savannas. Terrace communities are functionally distinct from the pine-hardwood communities of the uplands, having different moisture and fire regimes and corresponding differences in the flora, fauna, and vegetation. The Ouachita and Saline river reaches of the FLA support ten globally imperiled mussels, including the Ouachita rock-pocketbook (*Arkansia wheeleri*), Arkansas fatmucket (*Lampsilis abrupta*), and winged mapleleaf (*Quadrula frangosa*), as well as some 25 other mussel taxa. Eight globally imperiled fishes including crystal darter (*Crystallaria asprella*) and western sand darter (*Ammocrypta clara*) occur in the Saline and Ouachita. The two rivers support 120 species of fish and 40 species of mussel total.

The majority of the FLA is forested (84%, FIA), most of which is used in the production of forest products. Pine dominated terraces occupy more of the FLA than hardwood bottomlands. The extensively vegetated wetlands and uplands help maintain water quality for aquatic systems, and provide habitat for several avian guilds of conservation priority. Terrestrial habitats of concern include upland pine/grass, required by red-cockaded woodpecker and important to several high priority bird species. Local geology and soil conditions provide small patch diversity, including saline soil barrens such as Warren Prairie, that support globally significant plant communities, and the listed plant geocarpon (*Geocarpon minimum*). Other forest values include outstanding wildlife habitat which provides many hunting and fishing opportunities.

- **Ownership**

FIA data shows that industrial ownership is by far the largest class with 58.5% of the forests in the FLA. Private non-industrial ownership is 34.5%. Industrial ownership is declining and private ownership is increasing.

Public lands enclosed but not included in the FLA account for about 8% of the total ownership. Enclosed public lands are the Felsenthal National Wildlife Refuge, Crossett Experimental Forest of the Ouachita National Forest, Beryl Anthony Lower Ouachita Wildlife Management Area including Coffee Prairie Natural Area (easement held by ANHC), Warren Prairie Natural Area, Poison Springs State Forest, and Moro Bay State Park. The Army Corps of Engineers owns some lands along the Ouachita River.

- **Threats**

Fragmentation and parcelization are occurring in the US 167/I-69 Corridor FLA. Corporate owners are divesting some, if not all, of their land. Often it is being sold again in parcels of 1,500 acres or less as “higher and better use properties”. These smaller

parcels, even when they remain as timberland, have inconsistent and sometimes unsustainable management.

Although overall population is not growing within the FLA, there is a consistent market for exurban homestead farms of about 10 to 100 acres. Much of the terrace area that is not in industrial forest ownership is in this homestead farm type. Such landholdings may include a wood lot, but in general are in non-forest uses, such as chicken houses, tomato farms, and pasture. Many Arkansans are willing to accept a significant daily commute for the opportunity to live in lightly-settled, less regulated location buffered from the direct influence of neighbors. Interstate 69, proposed to cross about 50 miles of this FLA will increase access to nearby rural areas and encourage commercial development at interchanges, accelerating the current exurban migration.

High-intensity pine management, with herbicides, bedding and dense pine plantations, greatly reduces the viability and restorability of the native flora on the river terraces of the FLA. Fire suppression reduces the quality and quantity of pine/grass habitat for red-cockaded woodpecker, and for a suite of other fire-dependent plants and animals. Overly dense natural stands also stress the terrace communities.

Scattered oil and gas development has taken place on the Ouachita River adversely impacting localized areas. Also, the dam on the Ouachita River within Felsenthal National Wildlife Refuge has altered the hydrologic regime in the vicinity of Felsenthal. Water control structures in Louisiana may also be causing hydrologic stresses in the FLA along to the state line.

As forest is lost to increasing development, forest related functions such as: timber production enhanced water quality, groundwater recharge, and forest wildlife habitat are impaired or lost.

- **Solutions**

- 1.) Using easements or acquisitions protect forest lands from conversion to pasture and exurban homesteads.
- 2.) Using easements and acquisitions solidify and, if possible, connect existing public landholdings.
- 3.) Take action at landscape scale (e.g. target lands that connect or are adjacent to existing conservation areas).

Ouachita Mountains Ecoregion (Including the Arkansas River Valley):

The Ouachita Mountains Ecoregion is located in the west central part of Arkansas. It encompasses both the east-west range of the Ouachita Mountain and associated foothills to the south plus the Arkansas River Valley to the north. The largest land holding in this ecoregion is the Ouachita National Forest, which is 1.2 million acres. The most concentrated populated areas of the ecoregion are major cities including Hot Springs, Conway, Russellville, Ft. Smith, and portions of Little Rock.

Outstanding aquatic and terrestrial biodiversity, ranging from rugged novaculite ridges and sandstone glades, to mountains supporting the world's most extensive native shortleaf pine

woodlands characterize this ecoregion. Clear streams, rivers and wetlands, because of their excellent water quality, support diverse assemblages of fishes and mussels, including many endemic and globally rare species. The region is mostly forested (74%, FIA 2003) except for growing population centers.

Geologic attributes

The Ouachita Mountains include folded Paleozoic sedimentary ridges and rolling lowland river valleys; subsections of the ecoregion include Cherokee Prairies, Arkansas River Valley, Fourche Mountains, Central Ouachita Mountains and Athens Plateau. The ecoregion offers an abundance of upland game species, exceptional scenic ridge top views, and a fascinating and diverse geology.

Biologic attributes

Natural tall grass prairies in the Arkansas River valley offer outstanding displays of native wildflowers. With the exception of pasture operations in broad valleys and cropland on most of the major floodplains, the ecoregion is largely vegetated with forests or woodlands, ideally suited for woodland migratory and breeding birds.

The Ouachitas support outstanding aquatic and terrestrial biodiversity, with 48 endemic species, 104 globally critically rare to rare species and communities, and 44 species listed or potentially listed as threatened or endangered. Streams, rivers, and wetlands support assemblages of fishes and mussels, including endemic and globally rare species. Streams and small rivers in the Ouachitas are exceptional, and are home to endemic or rare Ouachita madtom (*Noturus lachneri*), paleback darter (*Etheostoma pallidorsum*), panther darter (*Percina pantherina*), Arkansas fatmucket (*Lampsilis powelli*), and the Ouachita kidneyshell (*Ptychobranchnus occidentalis*). Ouachita riverine and wetland habitats provide aggregation and breeding grounds for a variety of game and large-river guild fish as well.

There are a number of rare or endemic plant species and terrestrial plant communities in the Ouachitas as well; the Oak and Pine-Oak upland groups include five rare or endemic communities; and tall grass prairies include three rare or endemic communities. Ouachita rare plants include twistflower (*Streptanthus obtusifolius*), harperella (*Ptilimnium nodosum*) and geocarpon (*Geocarpon minimum*). Tall grass prairies and various woodlands host extraordinary insect biodiversity, including the rattlesnake master borer moth (*Papaipema eryngii*) and the Diana fritillary (*Speyeria diana*); pine-oak woodland groups are home to the endangered American burying beetle (*Nicrophorus americanus*). Upland communities are home to three globally rare or listed threatened invertebrates; six rare to globally rare or endemic aquatic insects occur in ecoregional streams.

Forestland status

The region, with the exception of lowlands in the valleys, is substantially forested. The Ouachitas are well known for their shortleaf pine stands. Also growing with the pine in many places are typical upland hardwood species such as oak and hickory.

Forest ownership

A large portion of this ecoregion is the federally owned Ouachita National Forest comprising over 1 million acres of forested landscapes. In 1988 46.7% was public, 22% was forest industry, and 31.2% was private. By 2003 46.5% was public, 20.6% was forest industry, and

32.9 were in private ownership (FIA). The data shows very small changes between ownership classes in the Ouachitas, making this ecoregion the most stable in ownership.

Census data and populations changes

Between 1990 and 2000, this area of the state experienced a population growth rate of 13.1%, reaching a total population of 881,967. It contains some of the most densely populated areas of the state. The population rose to 912,136 in 2004, which is an increase of 3.3%. Urbanization around Little Rock and Conway has grown dramatically within the last 10 years.

Timber economy

The Ouachita area has been a major source of forest products, primarily pine, for many years. Through forest management activities on the Ouachita National Forest and forest industry lands in this region, several large capacity mills have provided a long-term contribution to local communities. The economies of several of the mountainous communities are forest products based. Schools in these areas have been very dependent upon timber taxation and in-lieu fees paid by the Ouachita N. F. Figure 31 graphs the tons of timber harvested subject to severance taxes for the Ouachita Mountains Ecoregion.

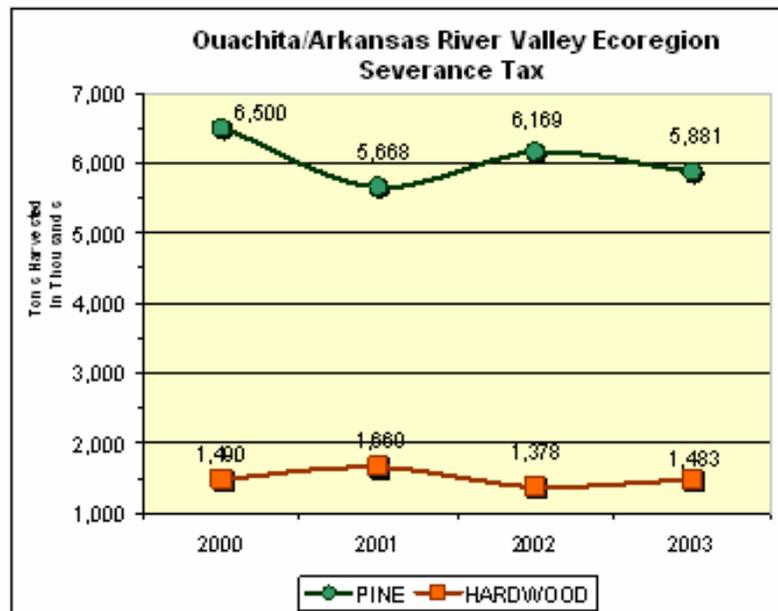


Figure 31

Severance taxes collected for hardwood and pine harvested in these counties have been extracted from each county tax collector's report. Reports indicate how much wood has been harvested for whole counties. For those counties partially included in the ecoregion, data for the whole county has been included.

This ecoregion is second only to the Upper West Gulf Coastal Plain ecoregion in timber production. Approximately, one fourth of all the hardwood harvested in Arkansas is harvested in this ecoregion, while about one third of the pine for the State is harvested in the

same area. Figure 32 graphs the Ouachita Mountains Ecoregion's percent of the total severance tax for the state for pine and hardwood.

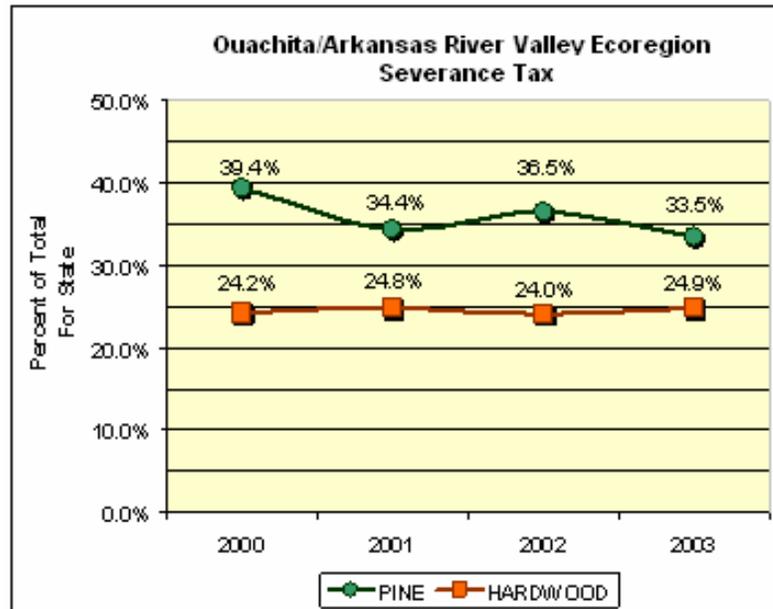


Figure 32

Sawmills in the area are fewer but on average larger than those in the neighboring Ozark ecoregion. Approximately, 40 primary wood-using plants were operating in this area in 2002, which is down slightly from about 45 in 1999. Since 1999, sawlog production has increased 5 percent and pulpwood production decreased 14 percent. Sawlogs account for 53% of the region's output.

Major threats to forestland

Conversion to urban/suburban development around population centers and reservoir watersheds is a top threat in the Ouachitas. Although undocumented, west Little Rock, Conway, and Hot Springs are examples of urban and watershed conversion creating an extensive wildland urban interface.

Parcelization of industrial holdings represents a threat to the future of forestlands within this ecoregion. The sale of industrial lands as "higher and better use" properties that break large tracts of forestland is a common occurrence which leads to suburban and exurban development. Extensive development of formerly forested hillsides threatens water quality of many upland streams.

Forest health issues such as oak decline constitute a significant threat to oak forest sustainability in the Ouachita region. Red oak borer has moved south out of the Ozarks into the Ouachitas. This combined with over-stocked, over-mature, and drought stricken trees leads to the oak decline problem.

**Ouachita Mountains
Little Rock-Hot Springs Urban Expansion – Forest Legacy Area**

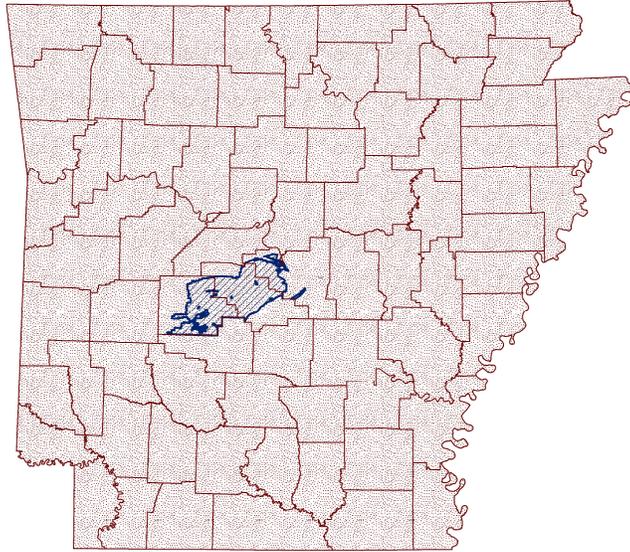


Figure 33

- **General description**

The Little Rock-Hot Springs Urban Expansion FLA, shown in Figure 33, includes the entire watershed of the upper Saline River in parts of Garland, Pulaski, and Saline counties. The FLA joins the US 167/I-69 Corridor FLA to the south and the I-40 Corridor to the north. A small part of the FLA in western Pulaski County is in the Maumelle River watershed. This FLA is completely contained in the Ouachita ecoregion and occupies approximately 586,343 acres in central Arkansas with an estimated 405,983 forested acres.

- **Why this area was chosen as an FLA**

This area was chosen for its aquatic conservation values that are associated with the four forks of the upper Saline River and for forest values, as listed on page 8, throughout the watershed. The FLA contains the western sprawl of Little Rock with Lake Maumelle, a municipal water source, and major developments associated with Hot Springs such as Hot Springs Village. Water quality is one of the most critical and valuable resources of concern in the FLA.

- **FLA Priority Strategies (ranked)**

1. Protect forested riparian zones and watersheds from conversion to agriculture and development
2. Buffer and connect larger protected ownerships, if possible

- **Forested attributes**

The Little Rock-Hot Springs Urban Expansion FLA is mostly forested (74%). Shortleaf and Loblolly pines are abundant mixed with upland hardwoods. Some smaller areas of bottomland hardwoods exist along the usually small stream courses. The Upper Saline forests are well used for many types of recreation including: hunting, fishing, hiking, mountain biking, and wildlife viewing, and camping. Wood products are regularly produced from this area and have been for many decades.

The Little Rock-Hot Springs Urban Expansion FLA also includes one of the most diverse stream systems in the Ouachitas. The Saline River as a whole is considered by some experts to be the most diverse aquatic system in the southeastern United States. It is also one of Arkansas' last major undammed rivers. As a result, the Arkansas Department of Environmental Quality has designated the Saline River as an Ecologically Sensitive Waterbody and Extraordinary Resource Waters (ERW). The ERW designation protects a waterbody by recognizing its distinct combination of chemical, physical, and biological attributes characterized by scenic beauty, aesthetics, scientific values, recreation potential and intangible social values. The upper Saline harbors at least six aquatic species with Federal Endangered Species Act listing status or State Special Concern status, including the Arkansas fatmucket mussel, the pink mucket mussel, and the Western fanshell mussel.

The Ouachita ecoregional assessment led by The Nature Conservancy identified 25 conservation targets for the upper Saline River, including 14 globally rare insects and several natural communities found only in the Ouachitas.

- **Ownership**

The Little Rock-Hot Springs Urban Expansion FLA is owned approximately 43% by forest industry and 47% by private non-industrial owners. Many owners in the private non-industrial sector are thought to be absentee and second home/estate owners.

The public land ownership enclosed by the FLA but not included accounts for 10% of the ownership and is a portion of the Ouachita National Forest in the western and northern parts of the area and the Middle Fork Barrens Natural Area.

- **Threats**

Threats to the Little Rock-Hot Springs Urban Expansion FLA include parcelization, fragmentation, exurban, suburban, and urban development. The forests and their water courses are stressed by sedimentation, nutrient loading, and runoff from development and incompatible land use practices. Residential areas are being developed in the west Little Rock and Hot Springs urban areas. Possibly even more threatening is the trend of private owners to buy small acreages (5 to 40 acres) to develop as a second home and retirement home sites. Once these people retire, second homes will become primary residences and exurban dispersed development will become more densely populated suburban areas.

High-intensity pine management, using herbicides, ripping, bedding, and then planting dense pine plantations, is also a source of stress throughout the upper Saline watershed. Finally, overly dense natural stands may be affecting forest health in the FLA. All this diminishes other forest values such as aesthetics, recreation, water quality, and wildlife habitat.

- **Solutions**

1. Identify reserves within urban sprawl areas to be retained as forested lands.
2. Purchase, through fee title or conservation easements, forest lands as identified in number 1.
3. Continue to pursue conservation easements with both private and industrial forest landowners to protect forests from conversion or fragmentation.
4. Enlarge, solidify ownerships and, if possible, connect public landholdings.

Ouachita Mountains

I-40 Corridor – Forest Legacy Area

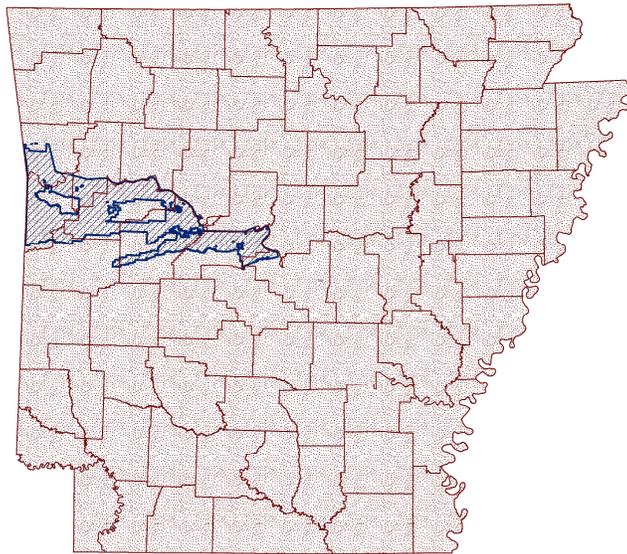


Figure 34

- **General description**

The I-40 Corridor FLA, shown in Figure 34, is located in the northwestern part of the Ouachita Mountain ecoregion. It includes parts of Crawford, Sebastian, Franklin, Logan, Johnson, Yell, Pope, Perry, Pulaski, and Conway Counties, and encompasses approximately 1,354,798 total acres with an estimated 654,798 forested acres.

- **Why this area was chosen as an FLA**

Rugged portions of the FLA are predominantly forested, having the full range of values listed on page 8. Several of the most scenic mountains of the state occur within the corridor including Mt. Magazine, the highest in Arkansas, and Petit Jean Mountain. Several of the areas support extensive working forests. Natural tall grass prairies in the more level portions of the Arkansas River Valley provide considerable biological diversity to the otherwise forested landscape. The Audubon Society has identified portions of the FLA as Important Bird Areas (IBAs) and The Nature Conservancy has identified portions of the FLA as key conservation areas in the Ouachita Mountain ecoregion.

- **FLA Priority Strategies (ranked)**

1. Buffer and connect larger protected forested ownerships such as Ouachita N.F.
2. Protect native woodland buffers of natural prairie.

- **Forested attributes**

The forests of the FLA are marked by dramatic topographic, wildlife, and plant community diversity. The eastern end contains level areas of bottomland hardwoods along the Arkansas River, and small, meandering upland streams such as Palarm Creek, Galla Creek, Fourche La Fave River, and the Petit Jean River. The middle portion of the FLA includes the Magazine Mountain range (the highest point in Arkansas), which is the dominant forestland in this region. The topography of the western half is mostly gently to moderately rolling hills, with some higher elevations. This part of the FLA supports shortleaf pine forests, post oak woodlands, pastures, and prairies. The steep terrain and high elevations of Magazine Mountain are home to seven rare plants, seven rare invertebrates, and some twenty rare plant communities. The forests and woodlands also support forest-dependent breeding bird species. The Arkansas River Valley forests represent a transition northward from the pine dominated Ouachita Mountains and contain a narrow band of bottomland hardwood forests in the lower elevations transitioning into upland hardwood and pine mixed forests in the higher elevations and northward into the Ozarks. Due to its proximity between these two east-west ranges, the river valley is quite diverse in the range of species occurring along the river corridor.

- **Ownership**

According to the 2004 FIA data 5% was forest industry held and 55.5% was in private ownership. Public lands enclosed but not included in the FLA make up 39.5% of the ownership and are the Magazine Mountain Ranger District on the Ozark National Forest, Magazine Mountain and Mt Nebo state parks, Ft. Chaffee and Army Corps lands (Department of Defense); Cherokee Prairie and Flanagan Prairie (Arkansas Natural Heritage Commission), Holla Bend National Wildlife Refuge, Blue Mountain WMA, Petit Jean WMA, Galla Creek WMA, and Ed Gordon/Point Remove WMA.

- **Threats**

The primary threats to forestlands in the I-40 Corridor FLA are conversion of forests to urban and exurban development and pasture on private holdings. Primary growth areas are around the main cities and towns along the Interstate 40 corridor, leading to increases in human populations and the need for infrastructure, causing forest fragmentation. Most affected are the areas around the communities of Conway, Russellville and Ft. Smith.

The rural lands along the Arkansas River Valley are primarily private-owned farms and ranches. With the adequate transportation network and forest products industries present, it is affordable to clear additional lands for agricultural uses.

The bottomland hardwood forests along the main tributaries are impacted by the navigational manipulations of the Arkansas River. The McClellan-Kerr Navigation project along the Arkansas River, developed in the early 1960s, has resulted in drastically changed hydrologic regimes within the forested bottoms. With prolonged inundation into the growing season in the bottomland hardwood forests, forest health problems are a great threat to sustainability of these oak-dominated sites. Along with the navigation

project, intermittent streams and creeks became permanent waterways for an influx of beaver populations. Beaver populations have dramatically increased throughout the FLA due to the increase in available habitat. This threat is most evident on public lands throughout the river valley.

Additional threats within the FLA include inactive mines and active gas wells.

- **Solutions**

1. Use fee title and easements to protect forest land from conversion to urban/suburban/exurban areas.
2. Enlarge, solidify ownership and, if possible, connect existing public lands.

Mississippi Alluvial Plain Ecoregion (MAP), including Crowley's Ridge:

The Mississippi Alluvial Plain (MAP) ecoregion is located in the eastern part of Arkansas. Its most defining features are the Mississippi River and the lowland rivers that enter the Mississippi in Arkansas. The area encompasses 9.4 million acres.

This ecoregion is characterized by a diversity of terrestrial, wetland, and aquatic habitats ranging from terrace prairies, to bottomland hardwoods and old growth cypress swamps, as well as oxbows, sloughs, and interdunal sandponds. Crowley's Ridge supports seepage areas and rich loess-based hardwoods. The MAP also supports world-renowned waterfowl hunting.

Geologic attributes

The Mississippi River helped forge this geologically complex area, cutting through and reworking Coastal Plain sediments deposited by a retreating Gulf of Mexico during the Tertiary Period of the Cenozoic Era, while simultaneously depositing new materials from lands further north. Alluvium left by annual floods and the migration of river channels further shaped the MAP ecoregion, during the Pleistocene Era when glacial outwash, sand and silt deposition and during the Holocene Era when modern rivers deposited the wide bottomlands of sand, silt, and clay.

Crowley's Ridge rises up to 200 feet above the floodplain and is comprised primarily of Tertiary deposits at its base, with well-drained and highly erodible wind-blown deposits (loess) forming a cap in places, especially at the south end.

Biologic attributes

The bottomland hardwood forest is the dominant natural plant community of the MAP. It is maintained by regular flood events and localized ponding on poorly drained soils. Headwater or mainstream flooding results from rainstorms over the watersheds of the Mississippi and its tributaries, and produces the large-scale annual springtime inundation characteristic of the ecoregion. Backwater flooding is a phenomenon in which high water stages on the Mississippi River create a damming effect, preventing tributary drainage into the mainstream and at times reversing tributary flow upstream. As a result, long-duration flooding accompanied by sediment and nutrient deposition occurs through many of the lower reaches of tributaries, such as the White and St. Francis rivers.

The diversity of forests and other communities characterizing the historic landscape provided extraordinary habitat for a range of species utilizing the MAP. River floodplain systems are highly productive and provide exceptional habitat for a variety of vertebrates including fish, amphibians, reptiles, birds, and mammals, as well as many invertebrates. Over 240 fish species, 45 species of reptiles and amphibians, and 37 species of mussels depend on the river and floodplain system of the MAP. In addition, 50 species of mammals and approximately 60 percent of all bird species in the contiguous United States currently utilize the Mississippi River and its tributaries and/or their associated floodplains. A number of MAP species are federally listed as Threatened or Endangered, including the interior least tern, the fat pocketbook and pink mucket mussels, pondberry, Red-cockaded Woodpecker, and the Ivory-billed Woodpecker, formerly thought to be extinct.

Habitat and patch diversity are also contributed by several distinct landforms in the MAP. These include the Grand Prairie, a Pleistocene terrace remnant that was vegetated by tall grass prairie until it was converted to agriculture. Pleistocene dune systems, with interspersed interdunal sandponds, support pondberry at several places in the Arkansas MAP. Saline soil barrens are associated with areas of Lefe and Bonn soils. The loblolly pine-post oak flatwoods also add diversity to the MAP vegetation, and one remnant supports nesting Red-cockaded Woodpeckers.

The deep loess sites on Crowley's Ridge support forests of rich, mesophytic hardwoods such as cucumber magnolia, beech, butternut, and various hickories and oaks, over rich shrub and herbaceous layers. The only native stands of yellow poplar in Arkansas are also part of these forests. Where loess is absent, drier site oaks and hickories and shortleaf pine-hardwood plant communities are present. Seepage areas add diversity in the northern end of Crowley's Ridge.

Forestland status

Over 80% of natural vegetation in the Mississippi Alluvial Plain is converted to other uses, primarily agriculture.

Forest ownership

According to FIA data for 1988 15.3% was in public ownership, 12.7% forest industry, and 72% private non-industrial. By 2003 18.2% was in public ownership, 11.3% in forest industry, and 70.4% was in private non-industrial ownership. It is the only area in the state showing increase in public over private ownership. However, public ownership is enclosed, but not included in the FLA. Most forested blocks have a substantial component of publicly owned land. The Arkansas Game and Fish Commission has 161,859.5 acres, with a total of 244,692.8 acres owned by the US Fish and Wildlife Service, the US Forest Service, and the Arkansas Natural Heritage Commission. The forests of Crowley's Ridge are for the most part privately owned.

Census data and populations changes

Between 1990 and 2000, this area of the state experienced a population growth rate of 3.2%, reaching a total population of 628,152. By 2004, this area of the state's population decreased to 623,068, or -0.8%. As opportunities for the local communities within this region continue to decrease, it is likely that the population will also, except in locally strong areas such as Jonesboro and Memphis, on and near Crowley's Ridge.

Timber economy

This region is focused upon the quality hardwood sawtimber products remaining from the fragmented bottomland hardwood forests. Most of the bottomland forests in this region are publicly owned and most are engaged in some form of forest management that provides an economic contribution to local communities.

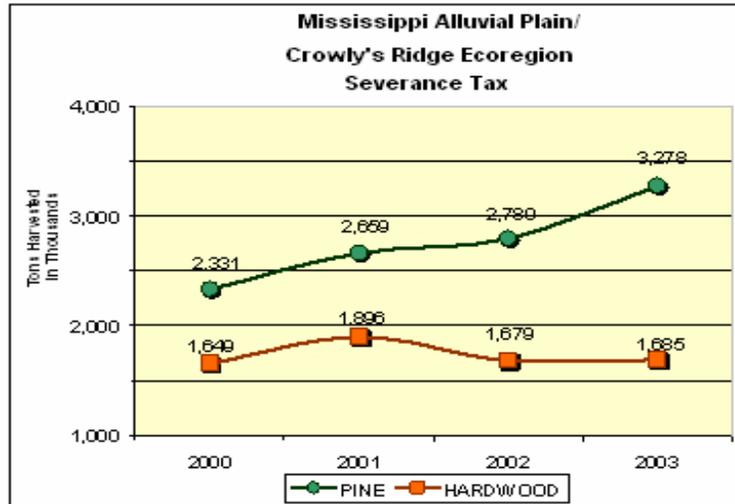


Figure 35

Severance taxes collected for hardwood and pine harvested in these counties have been extracted from each county tax collector's report. Reports indicate how much wood has been harvested for whole counties. For those counties partially included in the eco-region, data for the whole county has been included. Figure 35 graphs the tons of timber harvested subject to severance taxes for the Mississippi Alluvial Plain/Crowley's Ridge Ecoregion.

Approximately, 28% of all the hardwood and 19% of all the pine harvested in Arkansas is harvested in this ecoregion. Approximately, 42 primary wood-using plants were operating in this area in 2002 which is down slightly from approximately 49 in 1999. Since 1999 saw-log production has declined 5 percent and pulpwood production decreased 37 percent. Saw-logs account for 58% of the region's output. Figure 36 graphs the Mississippi Alluvial Plain/Crowley's Ridge Ecoregion percent of the total severance tax for the state for pine and hardwood.

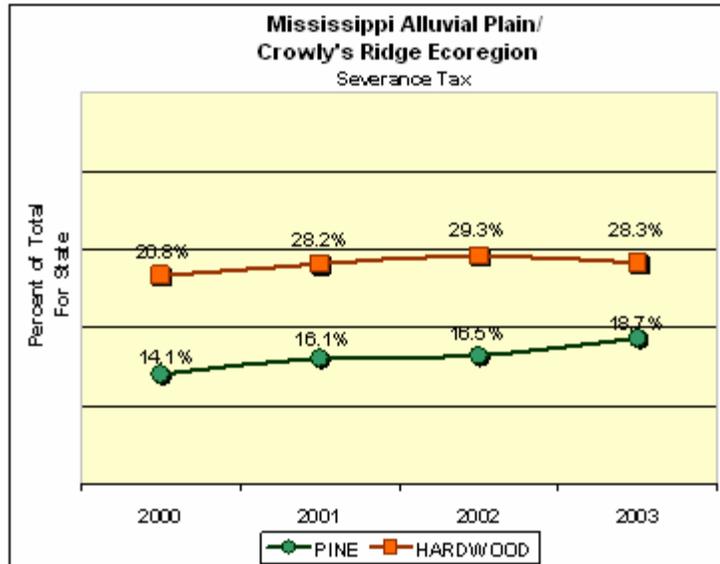


Figure 36

Major threats to forestland

The historical and current threat in the delta region is clearing and draining. Many agricultural fields are being precision leveled to conserve water use while eliminating natural drains, which in combination with release of irrigation water makes the existing remnant forests wetter. As hydrology continues to become altered, the persistence of historical forest is threatened.

Federal environmental programs under the Farm Bill, such as Wetland Reserve Program have had dramatic benefits for this region, but with the large number of hardwood plantations that have been established, it will be important for forest management to be implemented in the future. This establishment of new tracts of bottomland hardwood in no way reduces the biotic importance on the remaining natural bottomland hardwood stands that are privately owned. Incentives provided to private owners to manage these natural forests on a sustained-yield basis would benefit the region. WRP, CRP and other efforts could provide the connecting forests required to increase tract sizes. Because of these programs, net forest land is probably increasing in the Mississippi Alluvial Plain.

A higher frequency of prolonged flooding during growing season months poses a threat to forests along the White River. This results from upstream dam releases along many smaller streams and drainage field water from rice farms. As a result, bottomland hardwoods are being subjected to stresses that cause decreased growth and vigor which lead to canopy loss, and increased insect and disease activity.

Mississippi Alluvial Plain Crowley's Ridge – Forest Legacy Area

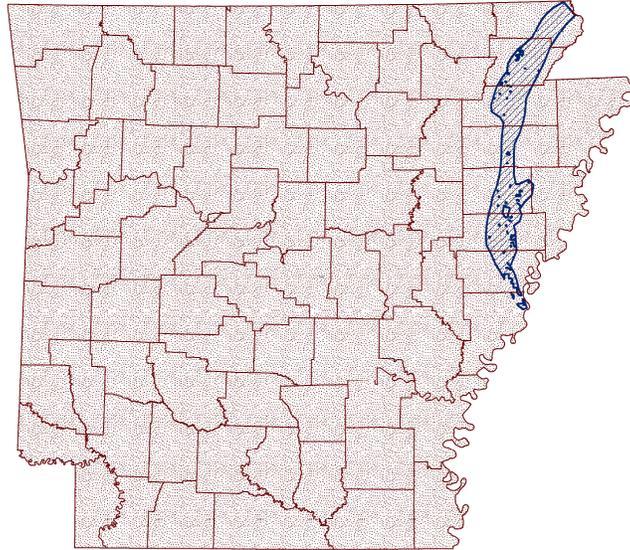


Figure 37

- **General description**

The Crowley's Ridge FLA, shown in Figure 37, ranges from ½ to 12 miles wide, and rises up to 200 feet above the surrounding alluvial plain, encompassing approximately 882,389 total acres with an estimated 227,719 forested acres. Crowley's Ridge is an erosion-formed remnant, formed when the Mississippi changed course to the east, leaving the isolated ridge of Tertiary deposits which were later mantled with wind-blown loess. At many points the terrain is gently rolling. The southern end has somewhat steeper topography and some striking views to the east across the alluvial plain where the Mississippi is close to the foot of the Ridge. This portion also has the deepest loess deposits.

- **Why this area was chosen as an FLA**

Crowley's Ridge FLA supports terrestrial conservation values, including a number of rare plants. Localized seepage wetlands are known from the northern part. It is a mixture of forestlands, agricultural lands, and urban/suburban areas. Crowley's Ridge has the only native population of yellow poplar in Arkansas. Its unique soils are highly erodible and need forest cover. The southern portion of the FLA is publicly owned, but privately owned (and much developed) to the north.

- **FLA Priorities Strategy (ranked)**

1. Protect the most extensive areas of loess soil hardwood forest
2. Buffer and connect larger protected ownerships, if possible

- **Forested attributes**

In many places, the deep loess sites on Crowley's Ridge support forests of rich, mesophytic hardwoods such as cucumber magnolia, beech, butternut, and various hickories and oaks, over rich shrub and herbaceous layers. Native stands of yellow poplar are also part of these forests. Where loess is absent, drier site oaks and hickories and shortleaf pine-hardwood plant communities are present. Seepage areas add diversity in the northern end of Crowley's Ridge.

- **Ownership**

According to 2004 FIA data 0% industry, and 82.5% privately owned. Public lands enclosed but not included in the FLA make up 17.5% of the ownership and are the St. Francis National Forest; Lake Poinsett, Crowley's Ridge, Lake Frierson, and Village Creek State Parks; Chalk Bluff and Wittsburg Natural Areas; and W.E. Brewer/Scatter Creek and Lee County Wildlife Management Areas. A new State Park is being developed within the St. Francis National Forest, under a special use permit between Arkansas State Parks and the USDA National Forest Service.

- **Threats**

Urban development is extensive in the vicinity of Jonesboro, but is also occurring around other urban areas such as Helena, Forrest City, and West Memphis. The greatest threats to forests of the ridge come from gravel mining. The only substantial deposits of gravel in northeastern Arkansas occur in the Tertiary deposits that make up the base of the ridge. Access to these deposits requires removal of underlying soil and vegetation. Since the gravel deposits are relatively thin, large areas are mined. Adjacent areas are affected because of landslides and erosion, as well as disruption of the local water table.

- **Solutions**

1. Acquire forestland easements that include mineral rights and preclude other forms of conversion as well.
2. Provide extensive buffers to public lands that preclude mining as well as other forms of conversion.

7. PUBLIC PARTICIPATION

The Arkansas Forestry Commission will solicit involvement and comments on the AON from the public including state and local governments. In addition to public hearings, the AON will be made available for viewing on the Arkansas Forestry Commission's website where any interested persons can find a link to the document and view it in pdf format. Public meetings will be held in each of the four regions of the state, Fayetteville, Jonesboro, Little Rock, and Camden. A list of the newspapers that will publish the notice of public hearings is provided in Appendix D. Public comments will be recorded and included in Appendix E. On April 25, 2007 to May 2, 2007, a public notice for the Buffalo River FLA amendment and the removal of public lands/lakes from existing FLAs amendment was published in a statewide circulation newspaper, the Arkansas Democrat/Gazette, according to procedures in Appendix C. No comments or requests for public hearing were received.

8. PROJECT EVALUATION & PRIORITIZATION

This guidance outlines the approach to be used to evaluate and prioritize individual Forest Legacy Projects submitted to the Arkansas Forest Stewardship Coordinating Committee for

consideration. Recommendations will be made by the Committee to the State Forester who must approve projects to be submitted to the U.S. Forest Service.

Objectives are:

- Provide a clear and defensible ranking process
- Insure fair, equitable and thorough review of all projects by the entire Arkansas Forest Stewardship Coordinating Committee

Proposed projects must:

- Be based on Arkansas' Assessment of Need
- Be located within a designated Forest Legacy Area
- Meet the goal and objectives of Arkansas' Assessment of Need
- Be at least 75% forested
- Must be privately owned
- Have a ranking of high, medium, or low for each national core criterion
- Have an indication of the level of project readiness
- Indicate if the project is to be phased (if so, how many phases are anticipated to completion)
- Indicate if the project can possibly be phased
- Indicate if the project must be funded in its entirety (would less than full funding be accepted)

The Arkansas Forestry Commission will insure all data for selected projects (to be submitted for funding) will be accurately entered into the Forest Legacy Information System (FLIS) by November 1st in order of priority. No more than three projects will be submitted. Combined projects will not exceed \$10 million, and no single project will exceed \$7 million.

RANKING (Guidelines for determining priority of interests in lands to be acquired)

The Arkansas Forest Stewardship Coordinating Committee will base project selection on the following national core criteria. Points have been assigned to each of the three criterions. There is a possible 30 points for each criterion with a combined maximum score of 90 points. Highest scoring applications will be accepted and passed on to be reviewed at the national level for possible funding.

The points assigned to the criterion below the maximum 30 point level may be given points between those lines of demarcation, but must be accompanied with comments justifying those variations. For example, a "Threatened" score between Likely and Imminent can be given 25 points as long as there are comments justifying the score.

Importance - The public benefits gained from the project and management of the property.

- Outstanding/Exceptional value – 30 Points – A national scale community of interest;
- Very Good – 20 Points – A regional scale community of interest (multi-State or within State);

- Medium/Average – 10 Points – A local scale community of interest; or
- Poor – 0 Points – No clear community of interest.

This criterion reflects the ecological assets and the economic and social values conserved by the project and the scale of the people's interest in its protection. It is meant to assess the attributes to be conserved and the size of the community receiving those benefits.

Examples of high quality attributes (order of attributes does not imply an importance):

- Scenic – In the viewshed of a designated scenic area
- Fish & Wildlife Habitat – Important fish or wildlife habitat exists
- Threatened or Endangered Species Habitat – Site has known habitat for rare, threatened or endangered plants and animals or includes unique forest types and communities
- Watershed Protection – Contiguous riparian area, sensitive watershed lands, lakefront, buffer to public drinking water supply
- Forestry – Integral in supporting the local resource-based economy for a community or region and the tract is a foundation to maintain the economic viability of forestry for the community or region
- Recreation – The property is a public access location or acts as a gateway to increased public access
- Cultural – Known culturally and historically significant values are located on site

Threatened – Conversion to non-forest uses or conditions is possible to imminent and will result in a loss of forest values and public benefits.

- Imminent – 30 Points
- Likely – 20 Points
- Possible – 10 Points
- Unlikely any time soon (within 10 years) – 0 Points

This criterion reflects an estimate of the urgency of the threat of conversion. It is meant to reflect the likelihood of a conversion that would result in the loss or diminution of the assets of a larger forest area

Strategic – The project fits within a larger conservation plan, strategy, or initiative and embraces previous conservation investments.

- A key property in regional, bi state or landscape conservation effort – 30 Points
- A key property in a state plan or focused protection strategy – 20 Points
- Will lead to additional conservation action in its region or area – 10 Points
- It is an isolated tract with no known connection at this time – 0 Points

This criterion reflects the projects relevance or relationship to conservation efforts on a broader perspective.

Project Readiness – A graduated scale indicating the level of commitment and likelihood a project will be completed in a predictable timeframe.

- Level 1 – 4 items completed
- Level 2 – 3 items completed
- Level 3 – 2 items completed
- Level 4 – 1 items completed
- Level 5 – 0 or less items completed

Items to be completed include:

- Completed appraisal approved to federal standards
- Completed appraisal awaiting review to federal standards
- Final easement or fee acquisition conditions
- Completed and approved Forest Stewardship or Multiple Resource Management Plan
- Cost Share commitment
- Signed option or purchase and sales agreement
- Held by a third party at the request of the State

Project readiness is a criterion that reflects the degree of due diligence applied and the certainty of a successful FLP project. It is intended to be a guide to project selection decisions. The readiness level is determined by the cumulative progression of items completed.

Project Scoring Table

<i>Project Name/State</i>	<i>Importance (0-30 pts.)</i>	<i>Threatened (0-30 pts.)</i>	<i>Strategic (0-30 pts.)</i>	<i>Readiness (Level 1-5)</i>	<i>Score</i>	<i>Comments</i>

Additional considerations for each project:

- Does the project enhance federal investment?
- What is the cost share of the project?
- Does the project provide good leverage?
- When will cost share be made toward the project?

Appendix A

The following is a list of people that worked extensively together to co-author and develop the Assessment of Need for the State of Arkansas.

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Appendix B

Federally Listed Species And Candidates For Listing In Arkansas

(LE – listed endangered; LT – listed threatened; C – candidate for listing; PD – proposed for delisting
CHD – critical habitat designated for species; H – historic occurrence; X – probably extirpated in state)

Freshwater Mussels

Ouachita rock-pocketbook (*Arkansia wheeleri*) – LE
Spectaclecase (*Cumberlandia monodonta*) – C
Curtis' pearlymussel (*Epioblasma florentina curtisi*) – LE
Turgid blossom (*Epioblasma turgidula*) – LE
Pink mucket (*Lampsilis abrupta*) – LE
Arkansas fatmucket (*Lampsilis powellii*) – LT
Neosho mucket (*Lampsilis rafinesqueana*) – C
Speckled pocketbook (*Lampsilis streckeri*) – C
Scaleshell (*Leptodea leptodon*) – LE
Fat pocketbook (*Potamilus capax*) – LE
Winged mapleleaf (*Quadrula fragosa*) – LE

Fish

Ozark cavefish (*Amblyopsis rosae*) – LT
Arkansas darter (*Etheostoma cragini*) – C
Yellowcheek darter (*Etheostoma moorei*) – C
Arkansas River shiner (*Notropis girardi*) – LT-H-X
Leopard darter (*Percina pantherina*) – LT-CHD
Pallid sturgeon (*Scaphirhynchus albus*) – LE

Cave Crayfish

Cambarus aculabrum – LE
Cambarus zophonastes – LE

Snails

Magazine Mountain shagreen (*Inflectarius magazinensis*) – LE

Mammals

Ozark big-eared bat (*Corynorhinus townsendii ingens*) – LE
Florida panther (*Felis concolor coryi*) – LE-H
Gray myotis (*Myotis grisescens*) – LE
Indiana myotis (*Myotis sodalis*) – LE

Amphibians

Ozark hellbender (*Cryptobranchus alleganiensis bishopi*) – C

Birds

Ivory-billed woodpecker (*Campephilus principalis*) – LE
Bald eagle (*Haliaeetus leucocephalus*) – LT-PD
Red-cockaded woodpecker (*Picoides borealis*) – LE
Interior least tern (*Sterna antillarum athalassos*) – LE
Bachman's warbler (*Vermivora bachmanii*) – LE-H

Insects

American burying beetle (*Nicrophorus americanus*) – LE

Plants

Geocarpon (*Geocarpon minimum*) – LT
Missouri bladderpod (*Lesquerella filiformis*) – LE
Pondberry (*Lindera melissifolia*) – LE
Harperella (*Ptilimnium nodosum*) – LE
Running buffalo clover (*Trifolium stoloniferum*) – LE-H

Appendix C

Procedures for Conducting Forest Legacy Public Meetings

- A notice of public hearing shall be published in a newspaper of general daily circulation for seven (7) consecutive days;
- The notice shall include a statement of the terms or substance of the intended action or a description of the subjects and issues involved, and the time, the place where, and the manner in which interested persons may present their views thereon.
- An electronic version will be made available for comment on the Forestry Commission website. Interested persons will be able to submit comments electronically to the forest Legacy Coordinator via e-mail.
- The AON shall be mailed to any person who shall have requested a copy.
- All interested persons will be afforded reasonable opportunity to submit written data, views, or arguments, orally or in writing.
- Opportunity for oral hearing must be granted if requested by twenty-five (25) persons, by a government subdivision or agency, or by an association having no fewer than twenty-five (25) members.
- The agency will fully consider all written and oral submissions

Appendix D

Daily Newspapers

Arkansas Democrat Gazette
P.O. Box 2221
Little Rock, AR 72203-2221

Banner News
P.O. Box 100
Magnolia, AR 71753-0100

The Baxter Bulletin
P.O. Box 1750
Mountain Home, AR 72654

Camden News
113 Madison
Camden, AR 71711

El Dorado News Times
111 N. Madison
El Dorado, AR 71730

Harrison Daily Times
P.O. Box 40
Harrison, AR 72602-0040

Jonesboro Sun
P.O. Box 1249
Jonesboro, AR 72403-1249

Northwest Arkansas Times
P.O. Box 1607
Fayetteville, AR 72702-1758

Southwest Times Record
3600 Wheeler Ave.
Fort Smith, AR 72901

Texarkana Gazette
P.O. Box 621
Texarkana, TX 75504-0621

Appendix E

Received Friday, October 14 2005

My name is Danny Harris. My brother and I own 1079 Acres in Cross County Arkansas on Crowley's Ridge. We are forest stewards and have been nominated for your "Forest Steward of the Year" award. I did not realize that you had the meetings on the FLP or I would have attended. If you have any more meetings scheduled, please reply with the time and date so that I can attend. I have read your entire assessment of need that is available online. I feel like this is a great program. Twenty years from now, our property could become a victim to urban sprawl due to development (There is a Wal-Mart Super Center 3 miles from our property corner). We also have over 10 million yards of confirmed gravel reserves on 192 acres of our property. The FLP gives us an option that best fits our needs and goals (Multi Use – Wildlife, Forestry, Soil and Water Conservation) and avoids urban sprawl and gravel mining. The FLP would enable us to focus on our Forestry Stewardship Plan in perpetuity. There is no other program that I have seen that potentially makes it feasible for us to protect our property in perpetuity. This program is unique to the state and would be a great addition to the other AFC and NRCS programs that are available to land owners. It is hard to believe that in the future we (our generation) could be instrumental in protecting tens of thousands of acres of land in Arkansas in perpetuity. Thanks for your consideration of my comments.

Sincerely,

Danny Harris

From: John Reidhar [mailto:jreidhar@earthlink.net]

Sent: Tuesday, October 04, 2005 9:39 PM

To: George Rheinhardt

Subject: Forest Legacy Program

Mr. Rheinhardt,

I have been looking over the draft of the FLP and think that it will be great for a lot of landowners. I have 300 to 1000 acres in Woodruff, Prairie, and Crittenden counties that could be a candidate for such a program as this.

Please keep me informed. If you send e-mail, please place the Forest Legacy Program in the subject line.

Thanks,

John Reidhar
3638 Reidhar Lane
Des Arc, AR 72040

Appendix F

Arkansas Active Land Trusts

American Wildlife Partnership
P. O. Box 350
Osage Beach, MO 65065-0350
Phone: 573-317-0906
Email: nedgoss@yahoo.com

Eleven Point River Conservancy
RR1, Box 1272
Alton, MO 65606-9743
Phone: 417-778-6897
E-mail: john.bird@elevenpointriver.org
Website: www.elevenpointriver.org

Northwest Arkansas Land Trust
P. O. Box 2211
Bentonville, AR 72712
Phone: 479-246-6745
E-mail: mail@nwalandtrust.org
Website: www.nwalandtrust.org

Ozark Regional Land Trust, Inc.
427 South Main Street
Carthage, MO 64836-1646
Phone: 417-358-0852
E-mail: ort@ipa.net
Website: www.ort.org

Rocky Mountain Elk Foundation
P. O. Box 8249
Missoula, MT 59807-8249
Phone: 406-523-4500
E-mail: rmef@rmef.org
Website: www.rmef.org

Source: Land Trust Alliance Website www.ltanet.org/findlandtrust

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- Arkansas Game & Fish Staff
- Arkansas Natural Heritage Staff
- The Nature Conservancy-Arkansas Field Office Staff
- Arkansas Soil & Water Conservation Commission

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Institute of Government
University of Arkansas at Little Rock
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Arkansas Department of Parks and Tourism
- Statewide Comprehensive Outdoor recreation Plan
Outdoor Recreation Grants Section
State Parks Division
Arkansas Department of Parks and Tourism
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