A Brief History of Forests and Tree Planting in Arkansas

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Forests are vital to the socioeconomic well-being of Arkansas. According to one recent report, Arkansas is the eighth leading wood-producing State (Smith and others 2009), providing billions of dollars of economic contributions related to the timber industry (University of Arkansas Division of Agriculture 2009). Additional benefits of Arkansas forests include tourism, hunting and fishing, water and air quality, and other goods and services that collectively make Arkansas forests an unsurpassed resource (figure 1). With such abundance today, it is difficult to imagine how much the Arkansas timber resource has changed during the past two centuries and, in particular, how much the forests have recovered since large-scale lumbering ended around 1930. Although most of this renewal started with forest protection and natural regeneration, much of the revitalization is also attributable to widespread replanting, including the reclamation of former agricultural lands.

Arkansas has long enjoyed ample rainfall, good soils, and a temperate climate, circumstances that are favorable for producing dense forests when their growth is not constrained by local site conditions or disturbance patterns. Geographers typically subdivide Arkansas into seven physiographic regions (figure 2). These include the low rolling hills of the timber-covered West Gulf Coastal Plain, where most of the loblolly pine (*Pinus taeda* L.) is grown; the Mississippi River Alluvial Plain, a broad, flat agricultural region now largely cleared of its original bottomland hardwoods and baldcypress (*Taxodium distichum* (L.) Rich.); Crowley's Ridge, a prominent line of hardwood-covered hills in northeastern Arkansas that sit above the surrounding river plains; the Ouachita Mountains, heavily forested with shortleaf pine (*Pinus echinata* Mill.) and mixed hardwoods; the Arkansas River Valley, a combination of agricultural and forested lands along the Arkansas River; the steeply incised Boston Mountains cloaked in oak-hickory forests; and the Ozark Plateau, also dominated by oak-hickory forests, with scattered shortleaf pine.

Today, much of Arkansas is forested. In 2005, forests covered about 54 percent of the State's 33.3 million acres (13.3 million hectares), with most of the remaining land dedicated to agricultural, residential, or commercial uses (Rosson and Rose 2010). Of these timbered lands, more than 58 percent were owned by nonindustrial private forest landowners in 2005 and nearly 19 percent were held in various public ownerships—the remaining 23 percent was owned by industrial or commercial interests (figure 3). The most recent Forest Inventory and Analysis (FIA) survey listed 100 tree species statewide, but only a handful (table 1) contributed most of the 27.1 billion ft^3 (767.5 million m^3) of standing live timber (Rosson and Rose 2010).

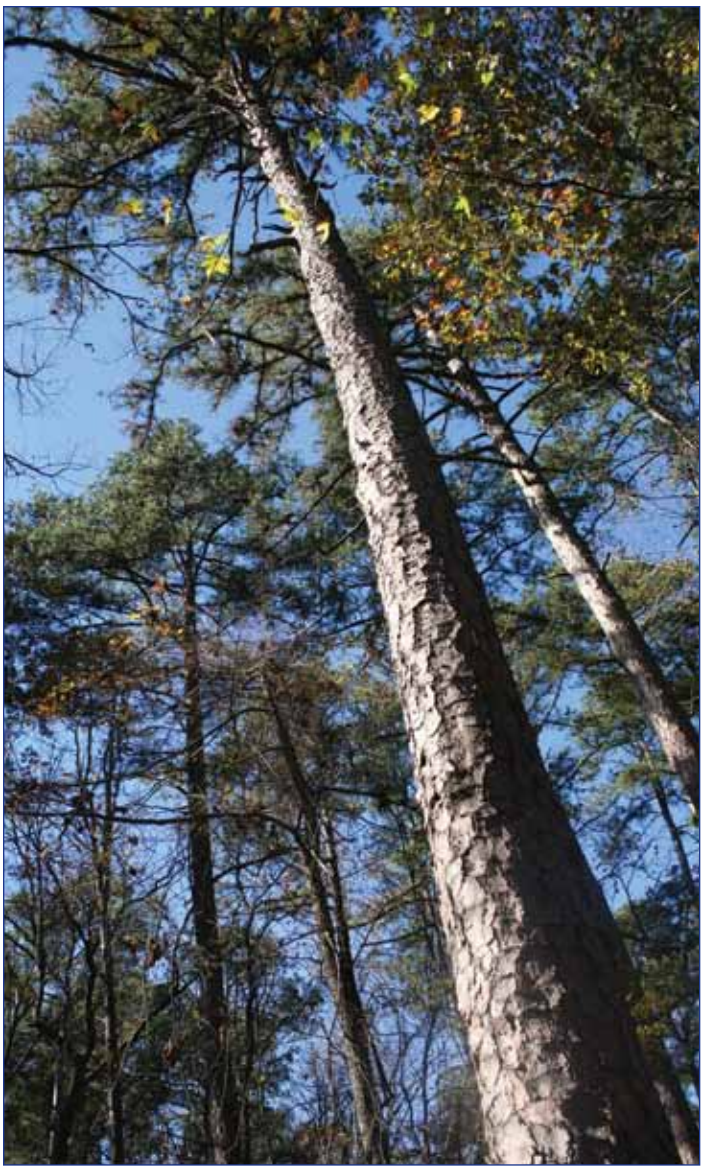

Figure 1. A mature, unmanaged second-growth stand of shortleaf pine, oak, and hickory in the Ouachita Mountains near Hot Springs, AR. (Photo source: Don C. Bragg).

Figure 2. The topography of Arkansas, overlain by the physiographic provinces. (Map adapted from Woods and others 2004).

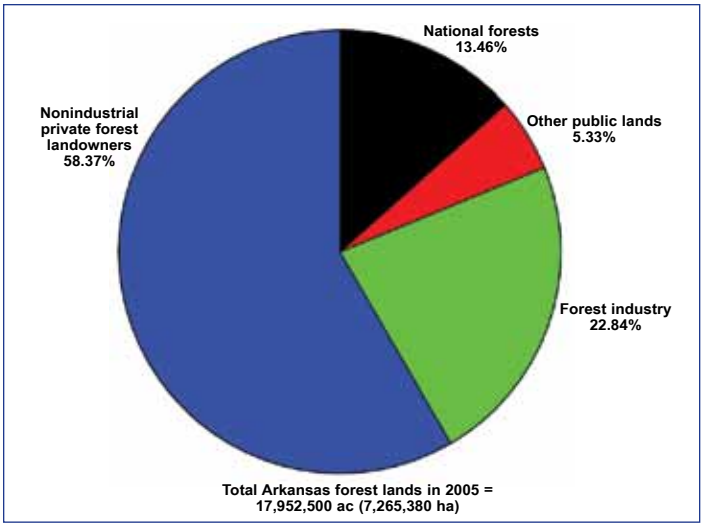

Figure 3. Forest land-ownership patterns for Arkansas in 2005. (Data source: Rosson and Rose 2010).

Table 1. Live tree volume of stems at least 5 in (12.7 cm) d.b.h. reported in the 2005 FIA survey of Arkansas forests.

Tree species	Live tree volume (millions of units) (ft^3)	(m^3)	Species total (%)	Cumulative total (%)
Loblolly pine (*Pinus taeda* L.)	6,040.1	171.1	22.29	22.29
Shortleaf pine (*Pinus echinata* Mill.)	3,467.5	98.2	12.80	35.08
White oak (*Quercus alba* L.)	2,555.4	72.4	9.43	44.51
Sweetgum (*Liquidambar styraciflua* L.)	1,922.2	54.4	7.09	51.61
Post oak (*Quercus stellata* Wang.)	1,441.5	40.8	5.32	56.93
Northern red oak (*Quercus rubra* L.)	974.3	27.6	3.60	60.52
Black oak (*Quercus velutina* Lam.)	876.2	24.8	3.23	63.75
Southern red oak (*Quercus falcata* Michx.)	850.9	24.1	3.14	66.89
Black hickory (*Carya texana* Buckl.)	639.7	18.1	2.36	69.25
Water oak (*Quercus nigra* L.)	612.9	17.4	2.26	71.52
All other 90+ species	7,719.3	218.6	28.48	100.00
Totals:	**27,100.0**	**767.5**	**100.00**	

FIA = Forest Inventory and Analysis. (Data source: Rosson and Rose 2010).

Past Forest Conditions

At the end of the last glaciation, pollen and other fossil records suggest a much cooler climate for Arkansas, with evidence of northern conifers such as jack pine (*Pinus banksiana* Lamb.), fir (*Abies* spp.), and spruce (*Picea* spp.) present in the Mississippi River Alluvial Plain, while the uplands were dominated by trees from more northerly climates (Delcourt and Delcourt 1981, Royall and others 1991). Thus, when the first Arkansans (the Paleoindians) arrived more than 13,000 years ago, they experienced completely different landscapes than seen today. As the glaciers melted during the next few thousand years, oak-hickory forests occupied most uplands and southern pines gradually spread into Arkansas. Modern forest assemblages followed a more stable and moderate climate approximately 4,000 to 5,000 years ago (Royall and others 1991). The recent climatic norm has been periodically interrupted by megadroughts, however, sometimes lasting for decades (Stahle and others 1985, Stahle and others 2007).

During the Holocene epoch, which began about 12,000 years ago, human populations fluctuated considerably, with long periods of limited population followed by rapid increases (and some declines). Native Americans affected Arkansas forests by using fire to manipulate the vegetation, consuming and disseminating the seeds of trees, and clearing forests. The practice of agriculture during the late Archaic and Woodland Periods (approximately 1,000 to 3,000 years ago) greatly increased during the Mississippian Period (between 500 and 1,000 years ago) and profoundly affected parts of the State. According to the earliest European chroniclers, Native American farmers cleared extensive tracts of forest land in eastern

Arkansas to grow corn, beans, and squash. For example, in the early 1540s, Spanish conquistador Hernando de Soto would sometimes travel for days in these tribal agricultural fields (Dye 1993). In southwestern Arkansas, the Caddoans were also farming extensively when initial contact was made with Europeans (Schambach 1993).

Unfortunately, written records of Arkansas forests before 1800 are very limited. Across much of the New World, indigenous populations plummeted after initial European contact. The extensive Mississippian agriculture witnessed by de Soto vanished by the time French missionaries and traders returned to the area 150 years later (Burnett and Murray 1993). The 1803 Louisiana Purchase included only a few French and Spanish settlers among a handful of Native Americans, including the Caddo, Quapaw, and Osage Nations. After this transition, the westward expansion of the United States brought increasing numbers of settlers to Arkansas, especially after General Land Office surveyors started subdividing the territory in 1815 (Gill 2004). Native American population removals by the early 1830s further accelerated Euro-American settlement, and by 1860 more than 430,000 people lived in Arkansas. During the antebellum period, demand for species such as baldcypress drove lumbermen up the large rivers into the virgin forests (Bragg 2011). The Civil War and Reconstruction periods appreciably slowed population expansion in Arkansas, but in the 1880s, dramatic growth returned, sparking markedly higher demand for forest products.

The exhaustion of the pineries in the Lake States and New England that occurred by the late 1800s sent more lumbermen southward. Some have estimated that the original forests of Arkansas had between 200 and 300 billion board ft of timber before extensive Euro-American settlement (Bruner 1930). Early reports on Arkansas forest conditions showed only limited exploitation of the timber resources in the immediate proximity of the major railroads (for example, Sargent 1884, Mohr 1897). By 1900, the infrastructure had greatly improved, making the extraction of timber resources much more efficient (figure 4). During this period, timber speculators purchased blocks of forest land and sold them to lumber companies which then constructed large mills and cleared the land. Operations such as the Crossett Lumber Company in southern Arkansas and Dierks Lumber and Coal Company in western Arkansas were able to acquire large holdings of virgin pine, hardwood, and cypress at a low cost (Smith 1986, Darling and Bragg 2008).

During the first few decades of the 20th century, the big cut of industrial lumbering in Arkansas occurred, with timber production peaking statewide in 1909. More than 2 billion board ft of lumber, 2.6 billion board ft of firewood, and hundreds of millions of board ft of cooperage, lath, shingles, crossties, veneer, and other wood products were cut in 1909, most of which was then shipped to out-of-State markets (Harris and Maxwell 1912). This rate of consumption far exceeded the growth of Arkansas forests. As in many parts of the United States, the Federal Government grew concerned about a possible timber famine and thus established the Arkansas (now Ouachita) and Ozark National Forests in 1907 and 1908, respectively, from parts of the public domain in the western and northern sections of Arkansas (Strausberg and Hough 1997). Timber volumes continued to fall precipitously in Arkansas, and many lumber operations closed their doors or moved on to the Western United States. By the late 1920s, much of the State's timber had been cutover, burned over, abandoned, or converted to nonforest uses. Forest cover, once estimated at 32 million acres (12.95 million hectares), declined steadily until stabilizing between 18 and 20 million acres (7.3 and 8.1 million hectares) in the mid-1900s (figure 5).

Figure 4. An example of the prime pine sawtimber found in southern Arkansas during the historic lumbering period. (Photo source: USDA Forest Service picture #353379).

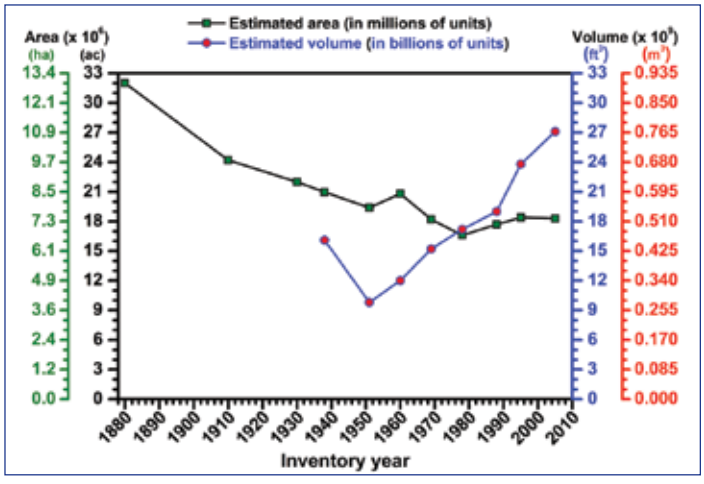

Figure 5. Forest area (1880 to 2005) and live tree volume (1938 to 2005) estimates for Arkansas. (Data sources: Record 1910; Cruikshank 1937, 1938; Winters 1938, 1939; Duerr 1948; Conner and Hartsell 2002; Rosson and Rose 2010).

After the collapse of the lumbering industry and the virtual disappearance of the virgin forest in Arkansas, attitudes towards forests and forestry began to change (Bragg 2010). Public outcry, the promotional efforts of private citizens, and pressure from the remaining industry eventually led the State legislature to establish the Arkansas State Forestry Commission in 1931 (Lang 1965). During the 1930s lands were added to Arkansas national forests when Federal legislation permitted the acquisition of abandoned or tax delinquent properties, and tree planting programs were incorporated into some of the relief work projects that were undertaken by various agencies during the Great Depression (Bass 1981, Strausberg and Hough 1997). Fire control, improved silviculture, conservation and education programs, and the reforestation of former farmlands helped reverse timber land decline in the State and led to decades of increasing forest volume (figure 5).

After silvicultural techniques for the most productive forest types were developed, the timber industry quickly rebounded in Southern States (Heyward 1958). Corporations, such as International Paper Company, Georgia-Pacific, Weyerhaeuser, and Potlatch, acquired large tracts of Arkansas timber land during the 20th century, especially in the West Gulf Coastal Plain and Ouachita Mountains. Because these large companies continually sought to increase the productivity of their lands, even-aged management approaches became favored over the uneven-aged silviculture that initially dominated timber harvesting practices in the State. Natural pine regeneration practices using seed tree- and shelterwood-based systems became prominent (figure 6), commonly with prescribed fire to control competing vegetation. International competition, continued improvement in genetics, herbicides, and stand density management, however, coupled with changes to tax and investment laws, have in combination increasingly steered timber companies towards operating even more productive loblolly pine plantations, especially after 1980.

Arkansas Forest Management Today

The mid-South region, which includes Arkansas, is currently projected to increase in forest acreage and overall timber volume, largely because of limited (or negative) population growth and the continued afforestation of former agricultural lands (Wear and Greis 2002). Arkansas depends on its forests to provide tangible and intangible benefits to its citizens and millions of visitors. According to a recent survey, more than 33,000 Arkansans were employed in forest-related industries that generated more than $1.6 billion in labor income and an overall economic impact of at least $2.8 billion (University of Arkansas, Division of Agriculture 2009). Timber harvests removed more than 810 million ft^3 (23 million m^3) of wood in 2006 (Smith and others 2009). Tourism is also critical to the State's economy, with more than $5.5 billion spent by visitors in 2010, much of which was related to forest-based experiences (Arkansas Department of Parks and Tourism 2011).

Arkansas forests remain in a state of flux. The coverage of natural origin pine, oak-pine, and bottomland hardwood forests in Arkansas (figure 7) has declined steadily since the early 1960s (Conner and Hartsell 2002), although these forest types still comprise 84 percent of current forests (Rosson and Rose 2010). During this same period, upland hardwood coverage has remained relatively constant and forests dominated by eastern redcedar (*Juniperus virginiana* L.) have increased significantly. Pine plantations (primarily of loblolly pine) have increased most dramatically (figure 7), increasing from

Figure 6. A modern-day example of successful seed tree regeneration of loblolly pine in the West Gulf Coastal Plain of Arkansas. (Photo source: Don C. Bragg).

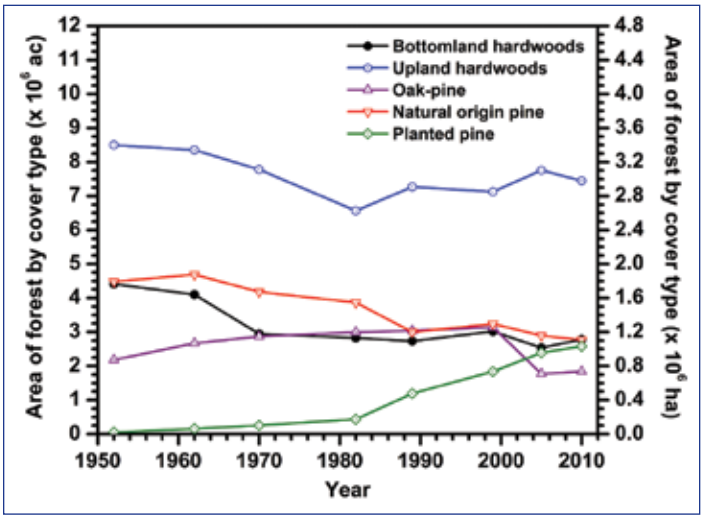

Figure 7. Change in Arkansas forest area by cover type from 1952 until 2010. (Data sources: Conner and Hartsell 2002; Rosson and Rose 2010; USDA Forest Service FIA 2011).

approximately 55,000 acres (22,300 hectares) in 1952 to just more than 2.94 million acres (1.19 million hectares) in 2005 (Conner and Hartsell 2002, Rosson and Rose 2010). Most of this increase has occurred since the early 1980s—the 2005 total represents 675 percent more land in plantations than the 1982 FIA estimate of 436,000 acres (176,400 hectares).

Not surprisingly, silvicultural practices have intensified during the past 50 years. Many landscapes once dominated by naturally regenerated, even-aged stands have become short rotation loblolly pine plantations, often with intensive site preparation (for example, ripping and bedding), improved seedling genetics, midrotation fertilization, and vegetative competition control (figure 8). Foresters plant improved pine seedlings at low densities and conduct precommercial thinnings in more heavily stocked pine plantations, often to remove naturally seeded volunteer pines. Arkansas forest owners generally do not use large quantities of fertilizer on their properties, which is common practice in other parts of the Southeastern United States. Most plantations receive one or two commercial thinnings before the stand is cleared and replanted, often on a rotation length of 25 to 35 years.

Figure 8. Ripped and bedded cutover pine plantation about to be replanted to loblolly pine. (Photo source: Don C. Bragg).

A History of Tree Planting in Arkansas

Undoubtedly, Native Americans were the first Arkansans to have planted seeds with the intent of starting new trees. It is likely that nut- and fruit-bearing species were cultivated near many Native American villages before Euro-American colonization (Davies 1994, Nuttall 1999, Abrams and Nowacki 2008). A number of Eurasian fruit trees, including the peach (*Prunus persica* [L.] Batsch), apple (*Malus pumila* Mill.), and pear (*Pyrus* spp.), were planted in Arkansas by either historic tribes or the earliest Euro-American colonists (for example, Bragg 2003). Early settlers also planted a number of ornamental trees from other regions, including southern catalpa (*Catalpa bignonioides* Walter), southern magnolia (*Magnolia grandiflora* L.), mimosa (*Albizia julibrissin* Durazz.), and tree-of-heaven (*Ailanthus altissima* (Mill.) Swingle) (Harvey 1880, 1883; Nuttall 1999). Before 1850, a few Arkansans even tried to get into the silk business by planting Chinese mulberry (*Morus alba* L.), although these efforts failed (Brown 1984). Settlers also learned of the benefits of certain native tree species—bois d'arc (*Maclura pomifera* (Raf.) C.K. Schneid.), for example, was prized as a living hedge and the source of durable, decay-resistant wood and a bright yellow dye (Gregg 1844, Robinson 1849, Harvey 1883) and, thus, was planted extensively.

In 1840, Arkansas produced $10,680 worth of products of the orchard (U.S. Department of State 1841). Nurseries that produced trees for planting began to appear in the State during the 1850s (Brown 1984). A growing horticulture industry resulted in the widespread planting of commercial fruit trees, particularly in northwestern parts of the State—in 1899, Benton and Washington counties each had more than 1.5 million apple trees (U.S. Census Office 1902). By 1919, apple production peaked statewide with a yield of more than 7 million bushels of apples (247,000 m^3) (U.S. Census Bureau 1922). Problems with insect pests, economics, and environmental conditions contributed to a steady decline in the industry, however, throughout the 20th century (Rom 2009). Commercial varieties of pecan (*Carya illinoinensis* (Wangenh.) K. Koch) and walnut (*Juglans* spp.) were also planted statewide during the 20th century, although the nut tree industry in Arkansas has never been prominent. For example, Arkansas pecan production in 1919 barely exceeded 364,000 pounds (165,000 kg), compared with nearly 17 million pounds (7.7 million kg) grown that same year in Texas (U.S. Census Bureau 1922). Christmas trees have also been planted in Arkansas, especially eastern redcedar and Virginia pine (*Pinus virginiana* Mill.), but production is very limited, with only 10,636 trees cut in 2007 (USDA 2009).

Outside of these ornamental and horticultural efforts, few people were interested in tree planting in Arkansas until near the end of the lumbering era. Around the 1920s, a few large family-owned lumber companies began to experiment with sustainable forestry practices (Hall 1925, Williams 1925, Woods 1925, Gray 1954), but they focused almost exclusively on natural regeneration. Through various programs and incentives, the Federal Government initiated a number of tree planting efforts. The passage of the Knutson-Vandenberg Act in 1930 further facilitated Federal tree planting by helping to fund postharvest reforestation work, using the proceeds of

timber sales from national forest lands, including seedling production, site preparation, and tree planting (Strausberg and Hough 1997). Additional reforestation efforts followed the acquisition of abandoned farmland and cutover forests that was made possible by the passage of the Clark-McNary Act in 1924. During the Great Depression, the Civilian Conservation Corps planted shortleaf pine, eastern redcedar, and various hardwood species on thousands of denuded acres acquired for the Ouachita and Ozark National Forests by the U.S. Department of Agriculture (USDA) Agricultural Resettlement Administration Program (Gray 1993). To meet these new tree planting demands, Ozark National Forest staff opened a nursery at Fairview on the Pleasant Hill Ranger District in the spring of 1929, but the nursery failed due to an inadequate water supply (Bass 1981). The next year, a new nursery was established on lands leased from Arkansas Polytechnic College (now Arkansas Technological University) in Russellville, and this facility entered full production by 1932 when an irrigation system was installed (Bass 1981). This nursery was turned over to the university by the 1940s, shortly after which it ceased seedling production. Over the years, most Federal research on forestry in Arkansas concentrated on naturally regenerated forests, although some study of tree planting and plantation forestry has occurred, including the largely unsuccessful testing of a number of exotic species (for example, Grigsby 1969).

Although initially beset by funding and staffing issues, by the mid-1930s, the newly formed Arkansas State Forestry Commission was producing millions of bareroot tree seedlings each year at nurseries near Conway (opened in 1934, now closed) and Scott (the Baucum Nursery, opened in 1936 and still in operation) (Arkansas State Forestry Commission 1934, 1936). Because tree breeding programs had not yet begun, these nurseries used seeds collected in the field, and primarily produced hardwoods for use in land stabilization projects. Of the seedlings grown at the Conway Nursery in 1935, more than 92 percent were distributed to two Federal agencies (the Rural Resettlement Administration and the Soil Conservation Service) (Arkansas State Forestry Commission 1936). In 1936 and 1937, the Baucum Nursery produced more than 10 million seedlings, of which nearly 90 percent were black locust (*Robinia pseudoacacia* L.), 8 percent were shortleaf pine, nearly 2 percent were Chinese elm (*Ulmus parvifolia* Jacq.), and the remaining fraction were other taxa, including loblolly pine (Arkansas State Forestry Commission 1936; David Bowling, Baucum Nursery, personal communication). Over the years, seedling production levels have fluctuated from a low of 355,000 in 1944 to more than 78 million in 1959, although recent production levels have been between 6 and 15 million seedlings per year (David Bowling, Baucum Nursery, personal communication).

Modern Tree Planting in Arkansas

Today, Arkansas is one of the leading producers of nursery-grown seedlings, especially bare-root loblolly pine, hardwood, and baldcypress (Moulton and Hernandez 2000, McNabb and Enebak 2008). For example, in the 2005 to 2006 planting season, Arkansas nurseries produced 12 percent of the loblolly pine, 31 percent of the baldcypress, and nearly 24 percent of hardwood bare-root seedlings grown in the Southeastern United States (McNabb and Enebak 2008). Most of the roughly 110 million trees produced annually in Arkansas nurseries are native species. In 1998, nearly 114,000 acres (46,100 hectares) of trees were planted in the State (Moulton and Hernandez 2000). Most of this acreage has loblolly pine plantations that were established by industrial and other private timberland owners in the southern half of the State (Rosson and Rose 2010). Oaks are planted primarily in the uplands of western and northern Arkansas, and a mixture of bottomland hardwoods are planted in the major river bottoms, especially for government conservation programs. Research into hardwood planting continues, with particular emphasis on native oaks, ash, and cottonwood, as well as some exotic hardwoods (for examples, see Grigsby 1969, Guo and others 1998, Heitzman and Grell 2006, and Spetich and others 2009). Unlike pine varieties in the State, there have been minimal tree improvement efforts for Arkansas hardwoods, with the exception of some hybrid *Populus* and second-generation cherrybark oak (*Quercus pagoda* Raf.).

To satisfy demand for hardwoods, two major industry-owned nurseries have supplemented seedling production efforts of the Baucum Nursery. In 1972, Weyerhaueser produced its initial crop of seedlings at a nursery near Magnolia, AR. This facility produces mostly bare-root loblolly pine seedlings, averaging approximately 50 million annually over the years. In 2011, Weyerhaueser's Magnolia Nursery also produced 2.9 million bare-root hardwood seedlings of more than a dozen species (primarily native oaks and baldcypress). All of the hardwoods and 70 to 75 percent of the loblolly pine seedlings produced at Magnolia are planted outside of the company's lands (Kevin Richardson, Magnolia Nursery, personal communication). In 1979, International Paper Company established a nursery near Bluff City, AR. Annual production quickly increased from 17 million pine seedlings (virtually all loblolly, with a small amount of shortleaf) in 1980 to more than 62 million seedlings by 1997 (Bill Abernathy, Gragg SuperTree Nursery, personal communication). In 2007, International Paper Company sold this facility to ArborGen. The nursery, now known as the Fred C. Gragg SuperTree Nursery, produced 38 million pines in 2011, 98 percent of which grew

from open-pollinated seeds. All seedlings are bare rooted, with the exception of a few thousand cottonwood cuttings. Production of various hardwood seedlings started in 1992, and now exceeds 4 million seedlings annually. Most pine seedlings that are produced at the Gragg SuperTree Nursery are distributed within Arkansas, while many hardwood seedlings are exported. To date, Magnolia has produced approximately 1.9 billion seedlings and Bluff City has produced more than 1.5 billion seedlings, and the Arkansas Forestry Commission has grown 1.3 billion seedlings since 1935.

Future Issues

Over the past few decades, almost all of the vertically integrated timber companies have divested themselves of their timber lands and now purchase raw materials on the open market. Most of these former company lands are currently owned by some type of a real estate investment trust or timberland investment management organization. These new landowners typically practice plantation-based forestry, especially in the piney woods of southern Arkansas (figure 9). During this period, government agencies and nongovernmental organizations also acquired a number of large parcels, primarily for conservation purposes. Public land management in Arkansas is usually considerably less intensive than private industrial land management. The Federal Government has shifted almost entirely away from clearcutting and planting and has moved toward ecosystem restoration using natural regeneration (Guldin and Lowenstein 1999). Typically, forestry consultants steer their clients towards intensively managed pine plantations, although many small landowners place wood production relatively low on their list of objectives (Rosson and Rose 2010). Private, nonindustrial forest owners are the least likely to manage their timbered lands in Arkansas, however, where many acres are still harvested with little concern for the future.

Figure 9. Precommercial thinning of loblolly pine plantations is frequently done to shorten rotation lengths in Arkansas. (Photo source: Don C. Bragg).

Seedling plantations also face a number of environmental challenges. Locally, native white-tailed deer (*Odocoileus virginianus* Zimm.), beavers (*Castor canadensis* Kuhl), rabbits (*Sylvilagus* spp.), other rodents, and even terrestrial crayfish have damaged or killed young planted trees. Many invasive species can be found in Arkansas, but rarely reach critical levels. Feral hog (*Sus scrofa* L.) populations have grown rapidly in recent years, and their rooting threatens new plantations. Kudzu (*Pueraria montana* (Lour.) Merr. var. *lobata* (Willd.) Maesen & S. Almeida), Chinese privet (*Ligustrum sinense* Lour.), and Japanese honeysuckle (*Lonicera japonica* Thunb.) are locally abundant but are generally not considered major forestry threats; however, a number of other exotic plant species do threaten the State's forests. Japanese climbing fern (*Lygodium japonicum* (Thunb.) Sw.) and Chinese tallowtree (*Triadica sebifera* (L.) Small) have recently invaded forests in extreme southern Arkansas, and cogongrass (*Imperata cylindrica* (L.) P. Beauv.) found in nearby States will likely reach Arkansas soon (Miller 2004). The effect of climate change on Arkansas plantations is still uncertain. If the climate does get warmer and wetter as predicted, however, it is possible that some landowners may eventually plant longleaf (*Pinus palustris* Mill.) or slash pine (*Pinus elliottii* Engelm.), rather than loblolly pine in the southern portion of the State, and perhaps continue to expand loblolly pine plantations farther north.

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