Southern Forests: Yesterday, Today, and Tomorrow

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Abstract—*In the 20th century, southern forests changed dramatically. Those changes pale, however, when compared to what happened to the people of the region. In addition to growing over fourfold in numbers, the South's population has urbanized, globalized, and intellectualized in 100 years. Rural and isolated in the 19th century, they are today urban and cosmopolitan. One result has been a complete change in the approach to forestry. No longer an industrial process harvesting what nature has grown, it is now a scientifically based management process that produces a wide variety of goods and services. Thus what is happening in today's southern forest is unlike anything that would have been imagined 100 years ago. A large part of that is due to the advances in forest science and its wholesale adoption by industrial corporations, nonindustrial forest owners, and public agencies.*

As the human population has grown and urbanized, however, a new threat to forest management has arisen. Urban pressures not only convert land from forest to other uses, they also pressure forest managers to eliminate practices that offend the sensibilities of urban people. This "proximity pressure" threatens to take far more forest out of sustainable management than actual land use conversion will take. In some southern areas, it may eliminate forest management entirely in the coming century.

Forest science is, thus, challenged to find new ways to manage forests and communicate the values of that management in ways acceptable to urban neighbors. If they do not, they will face the reality that knowing how to manage a forest well is of little value unless there are forests where management can occur.

INTRODUCTION

The story of the southern forests is a rich one, told in many ways by many people. This brief review will touch on three aspects of that story—land, forests, and people. It will feature two snapshots in time—1900 and 2000—spanning a century of great change to illustrate insights that could be of some value as we enter this 21st century. The main events that shaped the land, forests, and people of the South in the last century are well known. They include:

- The decline of agriculture and mining in the region, and the legacies these activities left behind on the land
- The movement of the timber industry to the region
- The development of professional forestry and land management
- The creation and growth of the U.S. Department of Agriculture Forest Service (Forest Service), the National Forest System, and the State forestry agencies
- The rise of the conservation movement with its new agencies and programs
- Two World Wars and the accompanying surges of demand for natural resources
- Population growth and associated urbanization

As this history unfolds, it reveals changes of such magnitude that, had they been foretold by scholars in 1900, those good people would have no doubt been made a laughingstock. As we enter the 21st century, we ask ourselves whether it is possible that changes of similar magnitude lie in store for the region. If so, we can only speculate as to what those new situations may be and how people and organizations may need to respond to them.

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THE PAST—LAND, FORESTS, AND PEOPLE IN 1900

The South consists of 13 Southern States running in a broad band from Virginia to Texas, with a total area of just over half a billion acres. That size has not changed markedly in the last century, and is perhaps the only common statistic between then and now. Everything else is different.

According to U.S. census figures, there were around 21 million people living in the region in 1900. That same source shows that somewhere around 60 percent of all Americans were living in rural areas at the time and it is clear that the South was overwhelmingly rural (U.S. Census Bureau 1990).

And the region's inhabitants were clearly "southern," often insulated from more than local influence by the limits of the communication and transportation systems of the day. For example, as late as 1936, one author describes the people in the Tennessee Valley in this way:

> The people . . . are hospitable, proud, salty, independent, illiterate by modern standards, and desperately poor. They are poor because many of their ancient crafts have lapsed or because in the highly specialized economy of today the exchange value of these crafts is low (Chase 1936).

Land and forest statistics were few in 1900, and estimates of the forest resource, for example, were little more than educated guesses. In 1896, Chief Fernow of the U.S. Department of Agriculture (USDA), Division of Forestry had this to say: "There are no forestry statistics in existence. Even the census figures referring to the lumber industry are avowedly imperfect and based on partial returns. The data given, therefore, are only approximations and must be taken with that reserve" (Fernow 1896). For the South, Fernow suggested that somewhere around 50 percent of the region still retained its forest cover. If he was correct, that would mean somewhere in the range of 250 million acres of forest at that time. He estimated the annual national timber harvest at somewhere around 40 billion board feet, with the South contributing about 25 percent. By 1900, however, it was estimated that the South was producing more lumber than any other region, and by 1919 it was said to be producing around 37 percent of the national total (Williams 1989).

Longleaf (*Pinus palustris* Mill.) and shortleaf (*P. echinata* Mill.) pine were the most important commercial species of the day, and Fernow had this to say about loblolly (*P. taeda* L.): "It is the 'old field' pine of the Southern States. Thus far it has been of much less importance as a source of lumber than the other Southern pines." He also noted that, among the oaks, white oak (*Quercus alba* L.) had been the type most harvested, being used "almost exclusively for construction and cooperage." "Black walnut," he wrote, "once common in the rich bench lands of the Mississippi Basin has been so largely cut as almost to have disappeared from market quotations" (Fernow 1896).

The pattern of forest harvest was telling. In an 1880 map of forest conditions of the South, the pattern of rivers and streams was clearly defined, shown as regions from which all of the merchantable pine had been cut (Williams 1989). The high value of the waterways for floating heavy logs to market made those areas the first to be cut over. In the swamps where the highly valued cypress (*Taxodium* spp.) was found, the trees were girdled and killed so that they would lose enough sap to float, then harvested from boats or by men wading in the water, to be skidded to a rafting point by "pull boats" that plied along channels that were blasted into the swamp to give a central access route to which the logs could be cable-skidded. With these methods, two things happened: cypress harvest rose to around 1 billion board feet per year by 1905, and the species was virtually cut out by 1913 (Williams 1989).

Forest conservation and management were virtually nonexistent. In many areas, trees were free for the asking, and public land could be taken for free or nearly free, as well. Private speculators were buying land for $1.25 an acre, estimating that it would yield from 6 to 12 thousand board feet per acre (Williams 1989). For the most part, the valuable pine trees were utilized only to the lowest branch, with the remainder left to rot or burn.

Other major southern forest products were the rosin and turpentine that were produced almost entirely by distilling the gum of southern pines. At the turn of the century, these were produced by tapping trees and collecting the resulting sap. By 1920, much of it was coming from the steam distillation of the old stumps left behind by early logging. Today, these products come as a byproduct of the process of pulping to turn pine trees into paper products (U.S. Department of Agriculture, Forest Service 1988).

For farmers in 1900, getting rid of trees so they could plow the land was the important concern, and valleys filled with smoke testified to the

widespread use of fire as a primary land clearing tool (Plair and Spillers 1960). Any lumber company that employed a technical forester for his knowledge of forest management would have been laughed out of the woods. You didn't need a college degree to swing an axe or wrestle floating logs out of a swamp.

Technology was coming into the woods rapidly, cutting costs, increasing output, and expanding the logger's reach across the landscape. Oxen skidding was slow and expensive, so wherever possible, it was being supplemented or replaced by splash dams, dynamited channels, pull boats, and other forms of water transport. Where the land was dry, railroads expanded rapidly to access valuable pine timber. Much of that technology was highly damaging to the environment, but those concerns were many decades from being effectively voiced. It was a time of "cut out and get out" to maximize the profits from land speculation.

For the lumber companies, the last profits from the land often came from selling it to would-be farmers, and many set up real estate offices to promote the virtues of farming on the cutover lands. But the soils were often sandy or swampy, and while a few farmers succeeded on the better lands, many simply played out their money and abandoned the place (Williams 1989). By 1920, it was estimated that 30 million acres of cutover forest showed little prospect of restocking or helping the region recover its resource strength (Williams 1989).

Thus the forest legacy in the early parts of the 20th century was one of cutover pine lands, a depleted cypress resource, and high-graded hardwood forests. As timber harvesting and agricultural land clearing continued, the region's forest acreage declined, reaching a low some time around 1920 (U.S. Department of Agriculture, Forest Service 1988). Adding to the region's forest woes was the chestnut blight {*Cryphonectria parasitica* (Murrill) Barr [formerly *Endothia parasitica* (Murrill) Anderson & Anderson]}. The killer fungus reached Virginia in 1912 and by 1920 had largely eliminated one of the most valuable species in the southern hardwood forests (Yarnell 1998).

Equally significant to the region's landscapes, agriculture was undergoing major change. King cotton was under siege by the boll weevil (*Anthonomus grandis grandis*), and crops were rapidly vanishing from hillside soils where cultivation had exposed susceptible soils to rapid erosion. A 1911 soil survey of Fairfield County, SC, for example, determined that 90,000 acres of formerly cultivated land should be classified as rough gullied land as a result of erosion (Bennett 1939). Those gullies, common across the region's sloping lands, were beginning to be a major topic of concern. Hugh Hammond Bennett, who would become the national leader in a new soil conservation movement, wrote the following about the soil erosion situation in the South:

> A much lighter rain than formerly now turns the Tennessee River red with wash from the red lands of its drainage basin. Added to the severe impoverishment of a tremendous area of land throughout this great valley, and its extensions southward into Georgia and Alabama and northward into Virginia, are the gullied areas, which are severely impaired or completely ruined by erosion ravines that finger out through the numerous hill slopes and even many undulating valley areas. Field after field has been abandoned to brush, and the destruction continues (Bennett and Chapline 1928).

In other places, the environmental effects of industry were plainly evident. In eastern Tennessee and northern Georgia, the acid fumes from copper and iron smelting killed thousands of acres of forest (Yarnell 1998). Stuart Chase (1936) describes one such scene in Tennessee:

> The road curved around the crest and Ducktown rose before us – a little village and a huge smelter perched on a hill. In a great circle about the smelter, measuring perhaps ten miles in diameter, every living thing had been destroyed by the sulphur fumes. These were bad lands without the balance and natural composure of a desert.

The picture that emerges from this long look back is pretty grim. Across the southern landscape, the evidence of land misuse would have been appalling to today's eyes. But the beginnings of the conservation movement were taking root, and the warnings were beginning to be heard across the land. In some respects, those warnings sound overly alarmist today, but then they were a wake-up call. There was much talk of a "timber famine," for example. How wrong was Pinchot (1910) when he wrote:

> The figures cited are, however, sufficiently reliable to make it certain that the United States has already crossed the verge of a timber famine so severe that its blighting effects will be felt in every household in the land.

Or what about Bennett, who testified in Congress (1935) that the soil erosion surveys conducted by the Department of Agriculture

> . . . revealed 51,465,097 acres of land essentially destroyed by wind or water erosion insofar as having further use for crop production, except for occasional patches. Most of this had been cultivated, and once was good soil.[2]

The timber famine, of course, never materialized, nor did millions of acres of American land turn into sterile desert. Does this indicate that the warnings were false, or does it indicate that an awakened citizenry could address land management problems and effectively correct destructive trends before they continued to disaster? There is ample evidence, I think, to support the latter view. Pioneers like Pinchot and Bennett, along with dozens of others in public service and private business, created the climate of public concern needed to support new public policies, agencies, programs, and expenditures. The increase in scientific knowledge through research and practice provided new tools to combat land waste. Private citizens, seeing that the future of their life's investments, whether in a family farm or an industrial corporation, required a more sustainable approach to land management, often led the way in experimentation.

LAND MANAGEMENT COMES TO THE SOUTH

As the 20th century dawned, a major national conservation movement was beginning to emerge. Slowly in many places and with many faces, it began to address the serious resource problems of America. Nowhere was this more evident, or more needed, than in the South.

From the time of his work on the Biltmore Estate in the 1890s, and also after he became Chief of USDA's Division of Forestry in 1898, Gifford Pinchot was intent on changing the manner in which private lumber companies were managing the Nation's forests. Within weeks after taking over the USDA job, he issued Circular 21, which launched an ambitious program of technical assistance to the companies. Secretary of Agriculture Wilson noted that, under this new approach, Federal technicians would provide advice and "the private owners will pay the expenses of Department agents who give instructions." Many companies accepted the offer, sending cash and offering free transportation and board to Federal agents who would come and help them (Steen 1976).

One example was the Kirby Lumber Company, which owned 1.2 million acres that contained about 80 percent of all the longleaf pine forest in Texas. A 50-man team from the Bureau of Forestry worked to gather data for a plan that contained recommendations on minimum tree size for logging, which trees to leave as a seed source, a timber marking plan, and a fire protection plan. This focus on assisting private landowners continued for only a decade or so, displaced not so much by failures in the program as by the enormous workload placed on the newly named Forest Service when the National Forest System was created under its management in 1905 (Steen 1976).

The administration of the forest reserves was transferred to the Forest Service, and the 1911 Weeks Act opened the way for the purchase of the lands that became the national forests of the South. These actions were largely the result of political action by citizens' organizations. Chief among these actors was the American Forestry Association (AFA), which had been founded in 1875 and counted virtually all of the top national forestry officials in its leadership. Also critical in the political wars were organizations like the American Civic Association and the General Federation of Women's Clubs. There was powerful opposition to the use of Federal funds for the purchase of forest reserves, and only the persistent and growing power of citizen's groups could overcome it (Clepper 1975). Land purchases under the Weeks Act started immediately after the law was enacted. In 1912, 287.7 thousand acres were approved for purchase at an average price of $5.65 per acre (Clepper 1975). The purchases continued across the region into the late 1930s, leading to the current system of national forests, comprising some 12.3 million acres in the region (U.S. Department of Agriculture, Forest Service 2000).

[2] Bennett, H.H. 1935. Statement presented before Subcommittee of House Committee on Public Lands, March 20, 1935.

The Weeks Act and later the Clarke-McNary Act spurred great growth in the cooperation between the Forest Service and the State forestry agencies. By the 1920s, thousands of landowners were receiving technical forestry advice from State service foresters, supported by a combination of Federal and State cooperative funds.

During this same period (1903 to 1928), Hugh Bennett was conducting soil surveys throughout the Southern States, and his warnings about the extent and danger of soil erosion were attracting increasing attention. Finally in 1929, Congress appropriated $160,000 for soil erosion studies and Bennett was placed in charge of the work (Sampson 1981).

THE NEW DEAL'S CONSERVATION DECADE

The 1930s brought enormous change to the forestry and land conservation programs of the United States. It was a time of great environmental and social stress. Thousands of displaced people, jobless and destitute, fled damaged farm and forest lands to seek work in cities, where there were few opportunities following the stock market crash of 1929. For President Franklin D. Roosevelt, the challenge seemed twofold—economic recovery and environmental repair. His proposal, in 1933, for a Civilian Conservation Corps (CCC) to provide needed employment and tackle the forest and soil conservation needs of the Nation, was passed into law by Congress after only 10 days (Sampson and DeCoster 1997). Young men were put to work for $30 a month in salary, half of which was to be sent home to their families. In addition, they were provided room, board, uniforms, and medical care.

In its 9 years of existence, some 3 million CCC men were provided with work and training, for a total cost of some $2.5 billion (Zimmerman 1976). Some of their impressive forestry accomplishments included the construction of more than 1,300 fire lookout towers, almost 40,000 miles of telephone lines, over 50,000 miles of roads and trails, 1.25 billion trees planted, and over 2 million man-days of fire fighting. Many of the campground facilities, lodges, and recreational sites developed by the CCC remain in use today.

In 1934, as the first national soil erosion surveys were being completed, dust from the drought-stricken Great Plains darkened skies in Washington, DC, and a new national soil conservation program was born (Sampson 1981). Although spared much of the Dust Bowl damage (except in Oklahoma and Texas), the South was the focal point of much of the new activity because of the widespread damage caused by gullying. As the new Soil Conservation Service was moved into USDA in 1935, it was given supervision of over 450 CCC camps that provided the manpower needed to address soil and water conservation problems. The CCC boys attacked gullies with little more than shovels and axes and, in the process, demonstrated that this serious erosion could be halted (Sampson 1985).

To help facilitate the local work of soil and water conservation, a new form of local special Government was created—the soil conservation district. As with many other innovations, it saw its first implementation in the South as Brown Creek District in North Carolina became the first to be formed (Sampson 1985).

Another influential venture of the period was started in 1927 when the AFA set out to raise money for an educational campaign on forest fire prevention and control aimed at the rural people of the South. Known officially as the Southern Forestry Educational Project, it was launched in Florida, Georgia, and Mississippi with the purchase and outfitting of five trucks. Each truck had an electric generator to power a motion picture projector and carried two men—a lecturer and a projector operator. Movies produced by the USDA and the AFA were shown in thousands of rural towns and were often the first motion pictures seen by many of the residents. At the end of the first year of operation, it was estimated that the trucks had traveled 78,000 miles into 94 counties and reached 700,000 people (Clepper 1975). By the time it was closed down in 1931, it was estimated that the "Dixie Crusaders," as the teams had begun to be called, had reached some 3 million people in the 3 Southern States and South Carolina, which had been added to the program (Clepper 1975).

While these were only a few of the activities underway, what also emerged in the 1930s was a new framework of Federal and State policy in regard to forests. In general, it emphasized the protection of forests from wildfire and the protection of wildlife from overharvesting. It promoted the management of forests, farmlands, and wildlife with methods based on scientific principles and carried out most of its activities through a variety of cooperative arrangements that often involved several Federal, State, and local agencies (MacCleery 1992).

While there were many achievements of this new policy approach, one of the more notable was the dramatic reduction in annual wildfire area. By the end of the 1930s, cooperative fire suppression programs were beginning to be more effective, and wildfires, which had burned as much as 50 million acres a year, began a decline that lasted through the 1970s (MacCleery 1992). Another important cooperative achievement was the dramatic increase in tree planting programs.

TREE PLANTING—PUBLIC AND PRIVATE

Planned reforestation through tree planting had started in the South early in the 1900s through the work of pioneering landowners such as Henry Hardtner of Louisiana, who planted about 27,000 acres to southern pines under a 1913 contract, and the Goodyears of Bogalusa, who planted some 15,000 acres (Williams 1989). But these were the exceptions, not the rule, and it was not until the 1924 Clarke-McNary Act that authorized Federal cost-sharing support for State tree seed and nursery programs as well as increased educational and technical assistance to landowners, that the program was able to gain real momentum (Zimmerman 1976).

While the forest products industry, with its future hinging on new tree crops, was the most aggressive tree planter, public programs have played an important role in spurring private landowners to reforest their land. Recent increases in tree planting have been as significant as those produced by the CCC in the 1930s. (Moulton and Hernandez 1999). In 1936 through the creation of the Agricultural Adjustment Administration, Congress authorized cost sharing with private landowners for conservation purposes. Included in those purposes was tree planting for reforestation, windbreaks, and shelterbelts.

But in midcentury, the appraisal of the Forest Service was still that tree planting was a major national need. Citing more than 114 million acres (23 percent of the commercial forest area) as being nonstocked or poorly stocked, the Agency said that tree planting was one of the most effective ways of getting that vast acreage into production and keeping it productive (U.S. Department of Agriculture, Forest Service 1958).

In 1956, the first version of a conservation reserve—the Soil Bank—was enacted to help reduce crop surpluses through conversion of cropland into grass or trees. Under the program, USDA cost shared tree planting and paid land rental for 10 years. In 1985, a similar program—the Conservation Reserve Program—was launched. It is still in effect, and by 1992 it was estimated that more than 2.5 million acres of trees had resulted. The South has taken full advantage of these programs. Over the last 20 years, from 65 to 82 percent of the tree planting in the United States has occurred in the South (Moulton and Hernandez 1999).

CONSERVATION CHALLENGE SHIFTS GEARS

This rapid overview of the changes in forests, land, and people of the South over the last century has shown that an early concern for the mismanagement of rural lands, including forests, led to a major conservation revolution. By 2000, the science of forest management had progressed far enough so that it could be concerned with more than timber supply. It could aspire to produce sustainable forests—forest ecosystems that remain productive and intact over centuries, continuing to produce a full variety of economic and environmental goods and services—because of the management and care of skilled hands.

During that century of change, virtually everything has changed. The amount of total forest in the South is now around 214 million acres (Smith and Sheffield 2000). If the 1896 rough estimate was accurate, that's a reduction of some 20 to 50 million acres. More comparable data suggest that, since 1952 when the first reliable surveys were taken, the area of timberland has declined from 204.5 to 201 million acres in 2000 (Powell and others 1993, Smith and Sheffield 2000). While that acreage change was modest, the amount of timber growing on the land has increased significantly. Softwood timber volumes rose from 60.5 to 105 million cubic feet in the region, while hardwood timber volumes rose from 88 to 152 million cubic feet (Powell and others 1993, Smith and Sheffield 2000). Thus on a similar area, the amount of standing timber almost doubled, signaling a major achievement for forest management and conservation over the past half century.

Today, southern pines produce merchantable timber in < 25 years in many places. The efficiency of timber utilization is extremely high, and logs with 2-inch tops are being sent to the mill in some places. As a result, fewer acres of forest are harvested to obtain a similar amount of useful product.

High-flotation machines move through pine plantations, thinning out excess trees and sending them off to market without leaving soil ruts—in places without leaving a mark to show they have passed. Riparian buffers and streamside management zones protect the most productive habitats on the landscape and, as a result, plants and critters great and small share the forest with commercial timbering operations.

The forest products industry, once noted primarily for its cut-and-run strategies, is today the largest single employer of professional foresters (Society of American Foresters 2001) and a leader in defining and applying the principles of sustainable forest management (AF&PA 2001). There is much to be learned, but the science and art of forest management has clearly matured significantly.

The revolution in U.S. forestry has been compared with the transition made thousands of years ago by agriculture—from a foraging activity that simply harvested what nature had provided to a cropping activity involving planting, tending, and harvesting (Sedjo 1991).

Now, however, a new conservation question has emerged as a result of the enormous land use changes in the 20th century, and it may be the most challenging that the forestry profession has faced to date. That question, in short, is: "How much forest will be available for sustainable forest management in the future?" We may know how to manage the land, but if manageable land is not available, that skill is of little value.

There are, perhaps, three aspects to this threat to the future of forests and forestry in the South. First is the direct conversion of forest land to other uses. No longer is agriculture the major consumer of forest land as it was in the past. Today, it is urban development that moves land out of forest production (U.S. Department of Agriculture, Natural Resources Conservation Service 2001). The amount of land converted is fairly modest. Between 1992 and 1997, it amounted to about 1 million acres in the Nation according to the USDA's National Resource Inventories. Given the increases in forest productivity and efficiency that have emerged from forest science in the latter decades of the 1900s, that loss alone is probably not terribly significant.

But it is not just the loss of forest land, it is the pattern of that loss that leads to the second aspect of the change. Forests are being increasingly fragmented, and that has both environmental and economic consequences. From an environmental point of view, habitats may become disconnected, making normal movements of plants, animals, and genotypes more difficult. Those that become isolated may find it more difficult to thrive, or even survive. From an economic standpoint, every forestry operation becomes more expensive as forest tract size declines and, at some point, the prices received for forest products go down as well (Thorne and Sundquist 2001). All of these effects make forest production increasingly marginal and, at some point, landowners simply give up on using the forest as a production asset and either hold it as an amenity or sell it to the highest bidder. Either way, the area available for sustainable forest management is diminished.

Finally, however, is the third aspect of the pressure—the one that may be most difficult to identify and quantify. This can be labeled proximity pressure and it works like this—as urban populations move into a rural area, the opposition to rural land uses is almost certain to rise. For farmers, it is the objection of urban citizens to the smells of livestock or the dust and noise of farm operations. For forest managers, it is opposition to the sight of a clearcut harvest, the weight of log trucks on local roads, or the pressure of land taxes that respond to potential land sale value rather than forest production values (Sampson and DeCoster 1997). The pressures can be either direct or indirect, but they are cumulative. They make continued production seem risky, and when landowners decide that there is little or no future for production agriculture or forestry in their area, that decision becomes self-fulfilling. Long-term investments such as tree planting or timber stand improvement are no longer made, and even the most conscientious landowners become land speculators—waiting to turn their life's work and investment into cash for retirement.

As landowners reduce their forest management, either through land sales or simply slowing down, they produce less wood for local mills and less work for local contractors. At some point, usually when a market downturn makes things even more difficult, those mills close or those contractors decide to move or go out of the business. In return, the remaining landowners who are still trying to manage their forests find their economic opportunities diminishing, either through reduced market competition, reduced availability of contractors, or the total lack of one or the other.

Table 2.1—1980–99 population by State, southern region, and nationally with 2004 projection

State	1980	1990	1999	2004	Change 1980–99	
					number	*percent*
Alabama	3,893,267	4,040,587	4,385,470	4,591,457	492,203	13
Arkansas	2,284,614	2,350,725	2,568,170	2,725,840	283,556	12
Florida	9,744,073	12,937,926	15,018,424	16,085,294	5,274,351	54
Georgia	5,462,825	6,478,216	7,698,381	8,429,990	2,235,556	41
Kentucky	3,660,129	3,685,296	3,965,923	4,099,292	305,794	8
Louisiana	4,205,883	4,219,973	4,394,632	4,450,485	188,749	4
Mississippi	2,519,711	2,573,216	2,774,493	2,905,761	254,782	10
North Carolina	5,879,261	6,628,637	7,590,605	8,060,154	1,711,344	29
Oklahoma	3,024,740	3,145,585	3,361,437	3,478,481	336,697	11
South Carolina	3,121,614	3,486,703	3,855,261	4,019,194	733,647	24
Tennessee	4,585,757	4,877,185	5,485,923	5,818,327	900,166	20
Texas	14,218,841	16,986,510	19,989,393	21,714,566	5,770,552	41
Virginia	5,345,266	6,187,358	6,884,125	7,296,332	1,538,859	29
Southern region	67,945,981	77,597,917	87,972,237	93,675,173	20,026,256	29
National	225,169,362	247,051,601	270,361,877	282,490,898	45,192,515	20

The result is a continued downward spiral in the local opportunity to own and manage forest land for sustained production.

To some observers, that may sound like a scenario limited to the heavily populated areas of the Northeast but not likely to concern the rural South. The facts, however, are that the South is becoming increasingly urbanized, and as a result, the future of forestry is dubious in many areas. Look, for example, at table 2.1, taken from U.S. Census figures and projections for 1980 to 2004. Note that between 1980 and 1999, the population of the region rose by 20 million. That means that between 1980 and 2000—a period of 20 years—as many new people moved into the South as the total population of the region in 1900! So now there are some 90 million in the 13-State area—almost one-third of the Nation's population.

But how can we assess this population change in terms of its implications for production forestry? To address this question, we developed maps of the South using a Virginia Department of Forestry study published in 1997 that analyzed that State's commercial forest in terms of its availability for future forest production (Liu and Scrivani 1997). They found that while the amount of forested land in Virginia has been relatively stable for the last quarter-century, the future of forestry on much of that land is likely to be greatly different from its past. Population growth, urban and suburban sprawl, and changes in forest ownership have caused some 20 percent of the State's forests to be doubtful in terms of future timber production.

The basis for assessing population pressures came from research by Wear and others indicating that the probability of sustainable management approaches zero at 150 people per square mile (psm); that there is a 25-percent chance at 70 psm; a 50-percent chance at 45 psm; and a 75-percent chance at 20 psm.[3] Using those thresholds, we utilized a new population density analysis produced by Oak Ridge National Laboratory to do a coarse-screen analysis of the likely impacts of the current population densities on future forest management (Dobson and others 2000). We combined these data with a national coarse-scale map of land ownership and land cover to identify where forest cover was likely to coincide with increased population density and where private lands were most involved. The results indicate that significant areas of the South are at risk of losing the ability to manage forest lands for production forestry. That conclusion has been fortified by the Southern Forest Resource Assessment, which forecasts that urbanization will continue to expand in the South at the rate of around 1.1 million acres per year until 2020 (Wear and Greis 2002).

[3] Wear, D.N.; Liu, R.; Foreman, M. 1996. The effects of population growth on timber management and inventories in Virginia. [Number of pages unknown]. On file with: Southern Research Station, Forestry Sciences Laboratory, 3041 Cornwallis Road, Research Triangle Park, NC 27709.

NEW APPROACHES TO NEW REALITIES

If there is to be a healthy, viable, sustainable forest resource in the South through the 21st century, what does it need? And how can forest science contribute to that need? There may be several ways:

1. Help define and promote sustainable forestry in all its different expressions

> There are many programs emerging to promote sustainable forestry. Most will, it appears, have some sort of certification linkage, where the land management is audited by an independent third party and some sort of product mark tells consumers that the wood products they purchase have come from a sustainably managed forest. This is a new movement, marked by a full share of controversy and complication as different systems compete to win the attention of both forest owners and the public. My advice—do not get caught in the competition. It, in itself, is healthy, as it forces all the systems to seek improvement. Encourage all these systems so that a forest landowner, whether they are a small private owner or a large corporate owner, can find a system that fits their needs. When the end result is better forest management, the name of the system that brought it about is inconsequential.

2. Help find ways to reach urban audiences and help them appreciate the value of well-managed forests as part of the urban-wildland infrastructure

> We must quit thinking of urban areas as one thing and rural areas as another (Gordon and others, in press). There is a continuum of places that make up a landscape, and without the rural aspects, the value of many landscapes as a human habitat is reduced. But unless urban people value rural landscapes, including rural forests, those rural landscapes will disappear under the invisible pressures we have discussed.

3. Bring new forest management techniques into the urban-wildland intermix

> Urban people will appreciate and tolerate forest management more when that forest management is sensitive to their lifestyle needs. No longer can forest managers handle their land as if nobody is watching. The truth is, most places, lots of people are watching. And they are not uncritical. They expect forest managers to create situations, views, and environmental impacts that are acceptable. And the definition of "acceptable" is somewhat fluid. Expectations rise.
>
> So forest science cannot rest on the many laurels it has created in the 20th century. The questions coming up are equally, if not more, difficult, and the public pressure to "get it right" will steadily increase. The amount of good forest land available for sustainable management is decreasing while the need for forest products and services—both timber and nontimber—is rising. The margin for error is declining. The need for a vibrant, growing forest science in the South has never been higher.

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