

**Small Woodlot
Management**

A New Challenge for Smokey

by Howard Muse and Bill Finger



North Carolina: Wood Basket of the Nation

An airline passenger flying across North Carolina for the first time might be surprised at the sea of forest green below. A curious passenger might even be shocked to know that almost two of every three acres of the entire state are covered by commercial forestland, about equally divided in softwood and hardwood. If lucky enough to fly on a clear day and if reflective enough to wonder about the forests below, this visitor to the state might notice still more. Take the commuter flight from Raleigh to Charlotte, for example.

About a third of the way to Charlotte, near the Moore County town of Carthage, lies a 322-acre tract of timberland — or what's left of it. In 1982, a mature pine and hardwood forest fell to loggers' chain saws, and the timber sold for

\$250,000. All the pines over 12 inches in diameter went, along with all the hardwoods. Only the spindly pines and logging residue, called slash, are left, looking from the air like a bombed-out war zone from old World War II footage. The owner does not plan to replant the stand but has leased it for oil and gas exploration.

Five minutes away (by car) stands an 83-acre forest owned by a 69-year-old retired sales executive. In 1970, acting on the advice of the N.C. Forest Service, this landowner clearcut 60 acres of poor quality pines and hardwood and replanted the area in loblolly pine, a fast-growing and commercially valuable softwood. He also selectively thinned a 30-year-old, 15-acre pine plantation for pulpwood. Finally, he burned part of this area to reduce the threat of wildfires and to improve wildlife habitat.

These two Moore County landowners are part of another staggering statistic. North Carolina has more forest owners than any other state, 245,000 in 1978, the latest year for which survey data is available (see Table 1). With an average 75-acre holding, these 245,000 individuals and corporations own 80 percent of the state's commercial timberland — almost 16 million

"Slash" remaining after harvest.



Howard Muse

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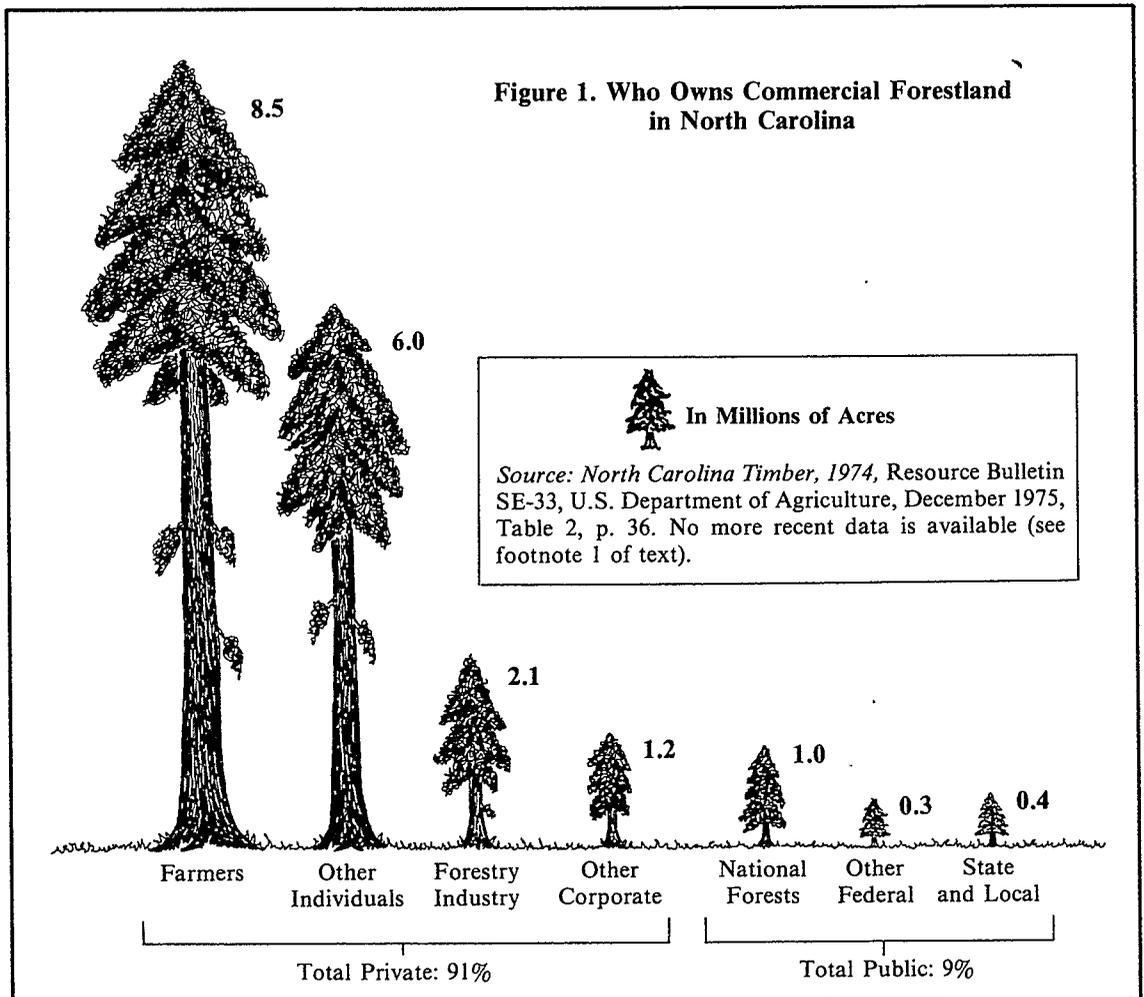
acres (see Figure 1). They include farmers and foresters, widows and estate executors, lawyers and bureaucrats. Most of these woodland owners, often in their middle or later years, have no incentive to manage their acreage. They have no timber management skills, don't care about the wood supply 30 years from now (the time necessary for a pine to mature), or lack the capital to finance replanting and other management efforts. Most timber owners rely on "benign neglect," allowing their timber to grow without any plan for the trees or the land.

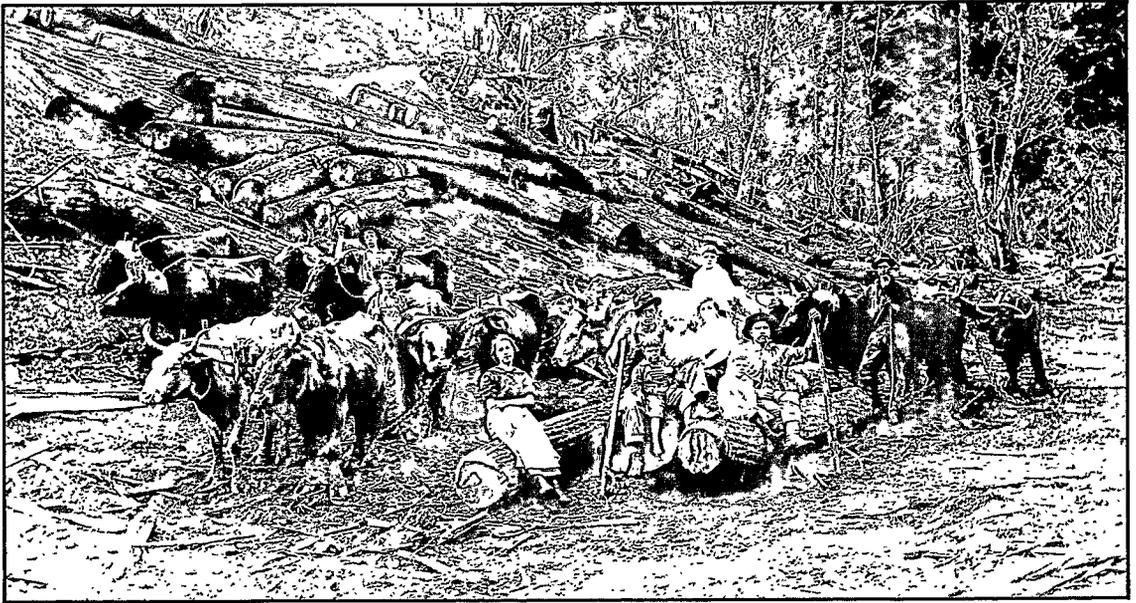
"Most people look at their forestland as a bank," says an N.C. Forest Service forester. "If they want a new car or a new tractor, they just cut their trees down." The development of "agri-forestry" practices has aggravated this tendency. Clearcutting, for example, has become a popular harvest technique, where large machinery strips away all of the trees at one time. "It's just butchered," says the forester.

While clearcutting has taken on an ugly image, "it ought to be a valid silviculture [i.e., forest management] practice," says H.J. "Boe"

Green, director of the N.C. Forest Service. "But it's often not used properly." Since tractors and other heavy machinery such as "timber skidders" began replacing horse or oxen harvesting crews in the late 1940's, a veritable revolution in timber harvesting techniques has cut through the South. Today's tree-length logging outfits, costing upwards of \$250,000 and featuring large rubber-tired skidders, often mandate clearcutting because of the damage the machinery inflicts on the residual stand during harvesting. If managed properly, a forest would be selectively thinned several times during its life and then clearcut at the end, which allows natural regeneration to take place. But unless clearcutting is used as part of a management plan, it can lead to serious abuse. Even when selective timber harvesting is an option, many landowners choose clearcutting because it brings the top dollar for their timber.

From 1964 through 1974, 15 percent of the state's commercial land (2.9 million of 19.5 million acres) was harvested, the U.S. Forest Service reported. Owners replanted 19 percent of the 2.9 million acres; another 36 percent of the





Courtesy N. C. Division of Forest Resources.

Hardwood logging with oxen teams, circa 1918-20.

acreage grew back naturally. But a whopping 45 percent — about 1.3 million acres — was not regenerated in any way.¹ In the 23-county northern coastal plain region of the state, the center of the state's forest products industry, 800,000 acres of the 6.7 million acres of timberland were harvested. Of this cut timberland, only 260,000 acres — about one of every three acres — was subsequently replanted, 90 percent of it by the forest industry. The timberland which was not replanted generally grew back in "green junk," low-quality hardwoods (red maple, sweetgum, hickory, oak, and other deciduous trees) which do not have a good market. "Regeneration efforts failed to keep pace with the rate of harvesting," concluded Herbert A. Knight and Joe P. McClure, authors of the U.S. Forest Service's 1974 survey of North Carolina.

Why are these regeneration and harvesting

figures important? "The United States is looking more to the southeast as the wood basket of the nation," Eric Ellwood, dean of the School of Forest Resources at North Carolina State University (NCSU) told the Commission on the Future of North Carolina (also known as N.C. 2000). "The great majority of the forest industry's capital investment is being spent in the South." The South now produces about two-third's of the nation's plywood, one-half of its hardwood lumber, and one-third of its softwood lumber.

In the first part of this century, the forestry industry cut mainly southern forests. It then shifted its focus to the northwest where large Douglas firs take 60 years or more to mature. Now the industry is coming back South, where a loblolly pine can mature for market in 25-30 years. In 1978, for example, Georgia-Pacific announced its decision to move its corporate

Table 1. Ownership of Commercial Forestland, by Acreage, North Carolina, 1978

<u>Acres Owned</u>	<u>Number of Owners</u>	<u>Percent of Commercial Forest Acreage</u>
1-20	109,203	45%
21-100	109,185	44%
101-500	24,691	10%
501-5000	2,518	1%
over 5000	132	less than 1%
Total Owners:	245,729	100%

Source: Recommendations to Increase the Productivity of Small Woodlots in North Carolina, The Governor's Advisory Task Force on Small Woodlot Management, 1978, inside front cover. Joe McClure, co-author of the U.S. Forest Service's North Carolina's Timber, 1974, thinks the survey methodology on which these numbers are based is not reliable. The Forest Survey's report does not break down acreage in this way. Despite McClure's doubts, these are the best numbers available and are the ones on which policy decisions within state government are based.

headquarters from Portland to Atlanta, where it started in the late 1920s. After 25 years out west, Georgia-Pacific decided to come back home because "more and more of our business is back where we grew up," as Robert Flowerree, then the company's chief executive officer, told *Business Week*.² In 1977, 75 percent of its sales and 72 percent of its profits came from the South and East.

The South has a longer growing season than the northwest. And new technology has made the loblolly pine much more valuable than it used to be (for plywood, for example). Most importantly, perhaps, the South has far more acreage easily accessible to the industry. In North Carolina, only 5 percent of the commercial timberland is in national forests, compared to 55 percent in the 14 western states. The U.S. Forest Service carefully regulates timber cutting in national forests, deciding the timing, extent, and method of harvest and then taking bids. In sharp contrast, *no regulations exist* on private land regarding when, where, or what kind of timber cutting is done. "If you want to expand wholeheartedly, you almost have to go South," says Portland (Ore.) forest products analyst Harold D. Mayhew.³

Even prior to the recent rebirth of the South as the wood basket of the country, the wood products industry commanded a major position in the North Carolina economy. In 1977, the wood-based industries in North Carolina (lumber, paper and allied products, and furniture) added some \$2 billion to the economy, fifth highest among the 50 states and higher than any other southern state.⁴ One of every 20 North Carolina civilians works in a lumber, paper, or furniture job (see Table 2 for employment figures

and rankings in the various wood-products industries). In addition, the 20 million acres of commercial forests in the state make up the state's premier natural resource, essential for soil conservation, watershed quality, wildlife protection, scenery, and recreation.

"A very positive forestry atmosphere is what entices industry to come to North Carolina," says state Sen. Robert Jordan III (D-Montgomery), who has a B.S. degree from NCSU in forestry and jointly owns and manages Jordan Lumber and Supply Company. "Industry is terribly impressed with our schools of forestry [at NCSU and Duke]. We can't compete with Louisiana soil types, but we're close to the markets in the northeast," says Jordan, who has been a leading forestry advocate in the General Assembly.

Forestry experts anticipate demand for wood products in this country to double in 50 years. Meanwhile, North Carolinians are cutting down more timber than they are replanting, and the timber already growing is not even approaching its potential. "The forestland is only about half as productive as it could be," says Boe Green, director of the Division of Forest Resources — also called the N.C. Forest Service — within the N.C. Department of Natural Resources and Community Development (NRCD).⁵ "We have good markets for all the quality trees that are available, but we need to improve the market for low-quality timber. And we need to turn some of the low-quality acreage into high-quality timber."

Green is talking about the fundamentals of economics: the law of supply and demand. The state could produce much more quality timber through better management — regeneration, selective harvesting, and better research into growth patterns — and still not create excess demand in existing markets, especially the furniture industry. But the state has an excess supply of low-quality "green junk." These low-grade hardwoods result from poor management techniques. For example, "green junk" usually grows back when an area is "high graded" — i.e., when the best trees are cut and the poorest ones are left — and not replanted. This "green junk" needs new markets, especially in the paper and energy fields. The foreign woodchip market could also use some of this low-profit "green junk."

Before the state's foresters began focusing on the vagaries of supply and demand, they concentrated on the biggest threat to the tree supply itself — fire. Begun in 1891 as a component of the N.C. Geological Survey, the state's forestry program initially emphasized fire fighting and gradually evolved into an agency

Table 2. Number of Employees in Wood-Products Industries—North Carolina, with Southeastern and National Rank, 1981

Industry	No. of N.C. Employees	Rank in Southeast	Rank in U.S.
Lumber and Wood	35,000	1	5
Furniture	84,300	1	1
Paper	21,400	2	12

Sources: North Carolina figures: *North Carolina Labor Force Estimates*, Employment Security Commission of North Carolina, October 1982, p. 246; Southeastern rankings: *Supplement to Employment and Earnings, States and Areas, Data for 1977-1981*, U.S. Department of Labor, BLS Bulletin 1370-16, September 1982; national rankings: *Supplement to Employment and Earnings, Revised Established Data*, U.S. Department of Labor, June 1982.



Be careful with fire.

that works to control forest hazards of all sorts (pests, erosion, etc.) and to manage forests as an economic resource. In the last 30 years, the state has developed a reputation for excellence for fighting fires. North Carolina, especially the eastern counties, presents an enormous fire hazard. The "galberry" brush, peculiar to the swamps of the eastern counties, burns with the intensity of gasoline. Even so, the average number of acres lost *each year* to fires in North Carolina plummeted from an average 226,251 during the 1950s to 94,348 in the 1960s, and declined again to 46,663 in the 1970s. Since 1980, however, the annual acreage lost has been about 87,000, due primarily to dry conditions. Three counties — Mecklenburg, New Hanover, and Union — choose not to participate in the state's fire control program. Hence, they avoid a fee assessment from the state but also must fight their own forest fires.

As the state forestry division has matured in fire fighting and fire prevention, it has turned

more attention to forest management. But seeing the forest as well as the trees demands real vision. The federal, state, and local governments own 9 percent of the North Carolina forests and the forestry industry another 11 percent (see Figure 1).⁶ How can the state help nearly a quarter of a million different forest owners improve management on the other 80 percent of the forests? Can the state find as effective a voice for tree planting as Smokey the Bear has been for fire prevention? Put another way, can Smokey meet a new challenge?

Who Manages the Forests

Three major types of managers function among the 18 million acres of privately owned timberland: the forestry industry, the state, and private consulting foresters. The forestry industry, which owns some 2.1 million of the 18 million acres, has the most intense, single-minded approach. The N.C. Forest Service is the other basic resource, administering federal and state programs of assistance. State rangers and foresters, who have limited authority and time to harvest or replant trees for landowners, work closely with private consulting foresters.

Since the early 1960s, when their tree-planting efforts moved into high gear with the advent of intensive "agri-forestry," the forest products companies have planted about 1.25 million of their 2.1 million acres of North Carolina timberland. "They are doing the job they think needs to be done to maximize timber production on each acre," says E. Carlyle Franklin, director of the Small Woodlot

Table 3. Acres Owned by Forest Companies, 1982

Company	Acres Owned in North Carolina ¹ (in 1000s)	Acres Owned in South ¹ (in 1000s)	Acres Owned in U.S. ¹ (in 1000s)
1. Weyerhaeuser	600	3,040	5,800
2. International Paper	350	4,500	7,400
3. Federal Paper Board	263	269	269
4. Georgia Pacific	196	3,400	4,600
5. Champion International	173	680	3,381
6. Union Camp	143	1,680	1,680
7. Continental Forest Industries	47	1,500	1,500

¹Acres "owned" in some cases includes various lease arrangements, which vary from company to company. For example, International Paper's 1982 *Annual Report*, in its "Statement of Significant Accounting Policies" (pp. 28-29),

explains that timberland value includes "capitalized timber harvesting rights."

Sources: Telephone interviews with company officials, April-May 1983.

Forestry Research and Development Program at NCSU. These companies plan to rotate their pine plantations every 25 to 45 years (depending upon whether the timber is used for sawtimber, pulpwood, or some other use) with several thinnings before the plantation is clearcut and the process repeated. Aware that they need individual landowners more than landowners need them, several of the larger companies — Weyerhaeuser, International Paper, Champion International, Federal Paper Board, and Union Camp — offer forest management services. (See Table 3 for ownership figures for the major companies.)

The best known and largest such program in North Carolina is Weyerhaeuser's Tree Farm Family, which in 1981 enrolled 643 landowners owning 217,534 acres, mostly east of Interstate 95. Weyerhaeuser, which owns more North Carolina land than any other forest company, provides management advice and forestry contractor services at cost and in exchange asks only the right to bid on a Tree Farm Family member's timber when it comes up for sale. The other private landowners assistance programs are much smaller. Federal Paper Board, for example, has 19,000 acres in North Carolina enrolled in its program.

Although Weyerhaeuser owns 600,000 acres of timberland in North Carolina — about half of which are in pine plantations — it still obtains 80 percent of its wood supply from private landowners. Even when its extensive plantations reach full productivity in a decade or so, it will still depend on private landowners for about half of its wood. The same pattern applies to the other companies with large land holdings.

The main burden of aiding timber owners falls not on the forestry industry, however, but on the N.C. Forest Service. Historically a low-key agency emphasizing fire prevention and fire

fighting, the state Forest Service in the last 15 years has broadened its services extensively. Still, it generally functions in a "you-come-to-us" manner. It neither has nor seeks any regulatory power over private forest management practices; it provides advice and services only on request.

If a landowner wants to manage his woodlot, he will more than likely turn to the Forest Service for advice. A county forest ranger, usually a technical school graduate in forestry (high school graduates have three in-service years to get their associate degree), will probably talk to the timber owner first. Whenever possible, the county rangers call on one of the state's 30 service foresters to examine the specific woodlot and make a "timber exam" with management recommendations. The 30 service foresters draw up about 3,600 plans a year covering some 237,000 acres. *No records are kept, however, of the number of landowners implementing the plans.* "The systems works pretty well in general," says E. Carlyle Franklin. "One of the outstanding needs is to have more service foresters, and ultimately one in each county." Arthur W. Cooper, head of the Forestry Department at North Carolina State University agrees: "A goal would be to have the equivalent of a service forester in each county."

The N.C. Forest Service gives a landowner up to five days of management assistance a year but will not estimate timber volumes or sell timber for a private landowner. The state foresters often refer landowners — those with large holdings, those with timber to sell, or those needing more management assistance — to consulting foresters. These professional foresters estimate timber volumes (called "timber cruising") and sell timber, usually on a percentage fee basis. In 1981, the North Carolina Society of Consulting Foresters listed only 42 members, all but 8 located in the coastal plain and Piedmont.

The systems briefly outlined above rely more on short-term gain from timber sales than on long-term development of a natural resource. Failing to regenerate pine timberland after harvesting remains the biggest gap in this patchwork system. In the 1960s, the N.C. Forest Service, recognizing the problems facing the small woodlot owner, began to address issues like regeneration. During the tenure of State Forester Ralph C. Winkworth (from 1966 until his death in 1980), the state took a number of innovative steps. "Winkworth was recognized throughout the South as one of the two or three top foresters," says Ben F. Park, executive vice president of the N.C. Forestry Association, the industry's trade group. Initiatives during Winkworth's tenure included:



Courtesy Deane Phelps

A State Reforestation Program. In 1969, the General Assembly provided \$2 million to the N.C. Forest Service to stimulate the private sector to expand site preparation and planting techniques. The state designed, built, operated, and rented new kinds of machinery, like a drum chopper that clears away residue before replanting. "There were few contractors who knew how to do the work," explains State Forester Green, a 30-year veteran of the forest service and Winkworth's successor. Functioning as middlemen, the state agents brought timberland owners together with contractors. Green says that today, because of this program, contractors in North Carolina are willing and able to prepare a site and replant it using sound management techniques. "Although now often taken for granted, the reforestation program was probably our most progressive step in small ownership forestry," wrote Winkworth.

Ad Valorem Tax Changes. In 1973 the legislature made two significant property tax changes affecting timberland. First, it prohibited counties from taxing standing timber, effective with each county's next reappraisal (the land is still taxed).⁷ Previously *both land and timber* were subject to the local property tax, causing some landowners to sell their timber prematurely. Second, the legislature allowed private owners of timberland (also agricultural and horticultural lands) to have their land taxed on the basis of "current-use" rather than on "fair-market" value.⁸ (Except in extremely rural counties, fair-market-value assessments result in higher taxes.) This "current-use assessment" law did not apply to publicly held corporate holdings but did include family corporations.⁹

N.C. Forest Development Act.¹⁰ Enacted in 1977, this act established a means for the state to help pay for regeneration efforts. In 1973, Congress had passed a Forestry Incentives Program (FIP). Administered by the Agricultural Stabilization and Conservation Service (ASCS), part of the U.S. Department of Agriculture (USDA), and in conjunction with the Division of Forest Resources, the FIP provided a model for helping landowners replant a cutover area. Through federal fiscal year 1980, 106,400 acres in North Carolina were replanted (mostly in loblolly pine) under the FIP program at a cost of \$5.5 million. Among the 50 states, only Alabama has done better (125,905 acres costing \$6.5 million). Federal funds paid 60 percent of the costs; the owner paid the rest. Similarly, under the state Forest Development Act, state funds pay a portion of the reforestation costs. Unlike FIP, however, the source of funds for the Forest Development Program is both a state appropriation (25 percent) and a tax assessment on forest



Mary Ende

products paid by timber processors (75 percent).

The Governor's Advisory Task Force on Small Woodlot Management. In 1978, Gov. James B. Hunt, Jr. established this ad-hoc task force to "delineate the problems and propose alternative solutions [for the small woodlot owner]. . . so that we might more fully realize the potential of our forest resources." The task force made recommendations in four general areas — marketing, research and technology, education among owners, and improving on-the-ground assistance to individual owners.¹¹ In response to the group's recommendations, the General Assembly:

- funded four new service foresters and six technicians;
- purchased 100 additional acres of land at the N.C. Forest Service's Claridge Nursery near Goldsboro, which boosted seedling production by 19 million a year;¹²
- established a Small Woodlot Forestry Research and Development Project in the School of Forest Resources at NCSU;
- excluded state and federal cost-sharing payments from the state income tax;
- allowed small woodlot owners to spread income from timber sales over a three-year period;¹³ and
- allowed reforestation expenses to be amortized over five years.¹⁴

On the executive branch side, Hunt established a State Interagency Committee on Small Woodlots, an informal working group chaired by Forest Service Director Green, and began pushing for more energy uses for wood.

Within this array of statutory and administrative actions, four issues merit some detailed review in 1983. 1) After four full operating seasons, the state forest development program needs evaluation. 2) Federal budget cuts are severely affecting forestry efforts, including the Forestry Incentive Program (FIP). 3) Interagency efforts at the state and local level are expanding in North Carolina. 4) The N.C. Forestry Association is lobbying to expand the "current-use" taxation provision to include corporate holdings.