Forest Pests

ISSUE: The productivity and environmental benefits of Oklahoma's forests are significantly reduced by insects, diseases and other pests.

BACKGROUND CURRENT SITUATION

Mortality and defects causes by insects and diseases in Oklahoma's forests cost over four million dollars annually in potential forest products. According to the 1976 Forest Survey, insects and diseases cause a loss of 8.1 million cubic feet of volume each year in the state, the equivalent of wood used in about 6,500 homes.

The loss of productivity and environmental benefits is not restricted to commercial forest land. It is apparent in urban areas, nurseries, seed orchards and specialty plantings as well.

Often pest problems go relatively unnoticed in the forest environment. However, incidents such as the recent occurrence of the Southern Pine Beetle in Oklahoma, and the subsequent damage inflicted, cause great alarm among landowners. Efforts are now being made by landowners to restrict this damage to minimum levels, although some state and federal lands in the state continue to take little or no control.

A common invader of southern pine in Oklahoma is the Nantucket Pine Tip Moth. This pesky insect attacks the terminal of young trees, laying its eggs within. The emerging larva then eat the tree's new growth until they mature and exit. Though seldom does the insect cause tree mortality, the tip moth frequently causes severe distortion and loss of growth among recently established pines. It is a primary pest in Christmas tree plantations, urban plantings, commercial nurseries, as well as in commercial forest plantations.

A potentially ominous threat for the future is the occurrence of a particularly destructive insect, the

Gypsy Moth. Introduced about 1860 from Europe, the Gypsy Moth has spread throughout the Northeastern States, and continues to spread westward. In late 1981, the pest was reported in Missouri, within only a few miles of northeastern Oklahoma. Unlike most major destructive insects, the Gypsy Moth is not particularly partial to any one tree species. The larvae are capable of defoliating huge acreages of forest, and past efforts to thwart their spread (including the use of DDT) have met with only limited success.

OKLAHOMA FORESTRY DIVISION'S ROLE IN THE ISSUE

The OFD provides assistance to landowners in identifying forest insects and diseases and developing control measures. This assistance is provided to both homeowners and forest landowners. OFD maintains a contract with OSU's Entomology and Pathology Department to assist its field foresters in providing this service.

On a larger scale, OFD monitors for outbreaks of insects or diseases in the commercial forestlands of the state. Aerial detection flights are made periodically and occurrence is noted. Landowners are made aware if problems exist on their holdings and technical assistance is provided to landowners in controlling outbreaks.

RELATED PROGRAMS AND ACTIVITIES

Plant Industry Division, State Department of Agriculture - Maintains a chemical and disease program which offers assistance to landowners. Also contracts with OSU's Entomology Department to assist in identification and control of pests of crops and livestock.

OSU Extension Service - Identifies, monitors and provides information to forest and homeowners on recommended control measures, including proper use of chemicals.

OSU, Department of Plant Pathology - Identifies tree diseases in the Plant Disease Diagnostic Laboratory and recommends control measures. Publishes a monthly summary of disease problems diagnosed. Publishes fact sheets on common problems. Researches plant diseases and their control.

OSU, Department of Entomology - Identifies forest and urban tree insect problems and recommends control measures. Publishes a monthly summary of pest problems diagnosed. Publishes fact sheets on common insect problems. Monitors state for outbreaks of pests. Conducts research on pest control methods.

Water Quality

ISSUE: Intensive forest management practices have caused concern for Oklahoma's water quality.

BACKGROUND CURRENT SITUATION

More than 40,000 acres of Ouachita Highland forest are being converted each year from uneven-aged mixed pine-hardwood forest types to even-aged pine plantation, and the effect of the silvicultural practices being used in this conversion on local water quality remains a subject of substantial public controversy.

Greatest attention is being focused on industrial forestland in southeastern Oklahoma, where intensive forestry practices are being implemented over large acreages and where more than 4,000 miles of new logging roads have been constructed since 1970. These activities have sparked some disturbing allegations, one of which predicts future major declines in smallmouth bass populations due to heavy siltation of clear water streams. In countering these allegations, forest industry contends its activities present no long-term detrimental effects on water quality or to the fish depending on it.

To meet the responsibilities mandated by state and federal laws, the State of Oklahoma has put forth efforts the past four years to determine the facts in the issue, and to develop ways to minimize any adverse effects of intensive forestry practices.

Public Law 92-500, the Federal Water Pollution Control Act Amendments of 1972, and Public Law 95-217, the Clean Water Act of 1977, require the states to control water pollution from "non-point" sources, or run-off. Section 208 of these acts designates silviculture (forestry practices) as a potential "non-point" source of water pollution, and requires each state to develop a plan by which such sources can be identified.

Further, the law states that the plan should "set forth procedures and methods (including land-use requirements) to control to the extent possible such sources."

Oklahoma currently has a "conditionally approved" Water Quality Management Plan, meeting the requirements of both PL92-500 and PL95-217. The procedures and methods set forth to control water pollution from silvicultural activities are based wholly on voluntary compliance by landowners to a set of "Best Management Practices" (BMP's).

It is significant that the current water quality plan provides for voluntary compliance to BMP's, in light of pressure being applied by special interest groups and the emphasis in the federal Acts on regulatory implementation. In effect, such regulatory action would create a "State Forestry Practices Act." Enforcement of such an act would be not only costly, but very difficult to administer, particularly on the state's six to eight million acres (both commercial and non-commercial) of non-industrial private forestland.

The design of reasonable and effective BMP's, and the evaluation of their effects, is severely hampered by a void in local information concerning natural water quality characteristics. Oklahoma's Water Quality Standards are based, to a large degree, on EPA recommendations and national standards--not on local research. This is significant because, according to the Clean Water Act of 1977, these standards will be used to identify water quality problems and to assess the effects of BMP implementation. Yet, recent water quality monitoring has revealed that some of the maximum allowable water quality parameter values described in the existing standards are frequently exceeded in nature, even on undisturbed watersheds. Further, the phenomenon of stream disequilibrium and frequent long-term cycles, together with the nature of the effects of forest practices, greatly complicate the design and application of water quality standards on forested areas. Monitoring

conducted on Ouachita Highland headwater streams over the past four years has shown that natural water quality parameter values have extremely high natural random variability, caused by a number of complex physical and biological interactions. Consequently, years of intensive water quality monitoring and study is necessary to assimilate an adequate data base on which to establish realistic water quality standards.

OKLAHOMA FORESTRY DIVISION'S ROLE IN THE ISSUE

The Oklahoma Forestry Division's involvement with the water quality issue increased greatly in 1975, as then-Governor David Boren directed the Department of Agriculture to hire a forest hydrologist to study and determine the effects of forestry practices on water quality in southeastern Oklahoma, and particularly the effects of those being implemented by the Weyerhaeuser Company. To make this determination, the Department's Forestry Division developed and initiated a water quality monitoring system on headwater streams of the Ouachita Highlands. After four years of monitoring, preliminary indications are that, although forestry practices have caused some increase in stream sedimentation, any major localized increases can be largely attributed to increased logging road construction. Further, no appreciable long-term detrimental effects on water quality resulting from forestry practices are evident. But, due to a high variability in the characteristics of water samples taken, further study is needed to make an accurate assessment in quantitative, rather than qualitative terms.

Oklahoma's 208 Water Quality Management Plan is broken down into "work tasks." Under one such task, the Forestry Division was designated to update and revise the "Best Management Practices" concerning silviculture

which were a part of the State's plan. This task was completed during fiscal year 1982, and received approval by Oklahoma's Pollution Control Coordinating Board on April 12, 1982.

Under other 208 work tasks, the Forestry Division is developing plans by which voluntary compliance to Oklahoma's BMP's can be attained, monitored and evaluated on a state-wide basis. Meanwhile, the Division's field foresters are being trained in BMP implementation, and are regularly incorporating them into the forest management plans they prepare for private non-industrial forest landowners. Although several landowners may be reached in this manner, a massive educational thrust will be required to inform the thousands of other private landowners and contractors throughout the state of the necessity for BMP implementation.

Interactions and the development of better communication with the other agencies involved in the state's water quality management planning process is considered by the Forestry Division as essential, if an effective water quality program is to be put forth. Through continuing meetings, discussions, and cooperation with EPA, the Oklahoma Pollution Control Board, the Governor's Natural Resources Mini-cabinet, the State Water Resources Board and other agencies and associations, the Oklahoma Forestry Division has kept abreast of planning activities pertaining to forestry within the state, and provided professional expertise and input when needed.

RELATED PROGRAMS AND ACTIVITIES

The Statewide 208 water quality plan addresses both "point source" and "non-point source" pollution. The functions of the agencies described herein, are those associated with "non-point sources" of pollution.

Oklahoma Department of Pollution Control - The ODPC is administered by a nine-member Pollution Control Coor-

dinating Board. The Department has overall responsibility for the development and implementation of the Statewide 208 plan. Among the duties and powers of the Board are:

> To coordinate and eliminate duplication of efforts by state agencies involved in pollution control and abatement.
>
> To assume jurisdiction in pollution matters if an agency having the statutory responsibility fails to do so.
>
> To promulgate rules and regulation necessary to abate, or prevent pollution when no other agency has jurisdiction to do so; or when there is overlapping or conflicting authority among state agencies.

Oklahoma Water Resources Board - The Water Resources Board, created in 1957, is a nine member board whose legislative authority includes the development of statewide and local plans to assure effective use and control of water to meet the needs of the people, the development of programs to prevent, control, and abate water pollution, conduct studies of water quality, adopt state water quality standards, issue permits for waste discharge into waters of the state, and to compile, index and publish available data concerning the water resources of the state.

Oklahoma Conservation Commission - The Conservation Commission is designated the lead agency in a number of work tasks in the State 208 plan. Among these are to identify locally sensitive areas, provide assistance in water quality monitoring, inventory and assess significant non-point sources, identify costs to control pollution from such sources, and to lend support and aid in updating the state's water quality standards.

Oklahoma State Department of Health - The State Department of Health is designated lead agency in a number of work tasks in the State 208 plan. Among these are to identify locally sensitive areas, conduct water

quality monitoring, provide laboratory support for monitoring, conduct non-point source assessments (related primarily to land-fills and waste disposal sites), identify best control techniques for such non-point sources, and lend support and aid in updating the state's water quality standards.

Statewide Policy Advisory Committee on the Environment (PACE) - is to give guidance and advice to the Department of Pollution Control and its contractors in performing the various tasks required by the water quality work plan. The committee is an integral part of the public participation process incorporated into the Statewide 208 Plan.

Oklahoma State University, Extension Service - OSU extension is designated a primary agency consultant in the 208 Plan. Extension Forestry is involved in the development of an information and education program for private landowners and processors.

Primary Agency Consultants to the 208 Planning and Implementation (other than those described above):

-Environmental Protection Agency
-Department of Economic and Community Affairs
-Soil Conservation Service
-Oklahoma Department of Wildlife Conservation
-Oklahoma Corporation Commission
-Oklahoma Department of Agriculture

Other Involved Agencies:

-Sub-state Planning Districts
-Oklahoma State University Research Foundation
-Oklahoma Economic Development Association
-State of Oklahoma Legislative Council
-Office of Attorney General
-U. S. Forest Service

Rural Community Fire Protection

ISSUE: Many rural communities in Oklahoma have inadequate fire protection.

BACKGROUND CURRENT SITUATION

According to the 1980 census, approximately 50% of Oklahoma's citizens reside in or near its 966 communities with populations of less than 10,000. In many of these communities fire protection is inadequate or non-existent. In fact, according to Oklahoma's State Fire Marshal "seventy-six percent of the state's fire departments are volunteer, with minimal equipment and inadequate funds to accomplish any appreciable upgrading of their fire protection capabilities."

A fire department's ability to provide effective fire protection depends on many factors. Among these are adequate equipment, competent personnel, effective planning, ample water supplies, and, of course, sufficient funding. Most rural communities lack one or more of these factors. As a result of their small populations, most have insufficient tax bases to support efficient, effective fire services. Consequently, they depend heavily on contributions, fund raising events and surplus or excess property to supplement municipal and/or county funding. Additionally, some fire departments are outside of municipalities altogether and sustain their efforts entirely on their own. While commendable accomplishments have been made in several communities across the state, overall, the majority of them lack effective fire protection capabilities.

Records indicate that most of the fire runs made by rural community fire departments are to wildland fires. However a lack of knowledge of fire behavior and wildland fire suppression techniques often puts their equipment and personal safety in jeopardy. Currently, only a minimum of wildland fire suppression

training is offered to volunteer fire departments in the state. OSU's Fire Service Training, among the best in the nation, has taken steps to increase the availability of such training through classes conducted at various locations in rural Oklahoma. But, due to a lack of instructors and inadequate funding, OSU has been unable to provide the number of sessions necessary to train the many hundredsof firemen in need. Further, volunteer firemen sometimes find it difficult to attend training sessions that interfere with their full-time employment, and the need to provide training at times and locations suitable to their schedules is apparent.

Among the most perplexing problems facing rural community fire departments is the lack of water in the rural areas with which to fight both structural and wildland fires. Often, Rural Water Districts fail to consider the need for water in firefighting. Seldom are fire hydrants installed along lines, and on occasions, lines are not of sufficient size to support the pumping capacity of today's modern fire trucks. Owing to this, firefighters in some areas must frequently make long runs for water, leaving the fire to burn until they return. Some departments have resorted to hauling large quantities of water by tank truck to fires in outlying areas, or to drafting pond water when available.

The State Fire Marshal's office, responsible for, among other things fire occurrence statistics, describes fire occurrence reporting by rural volunteer fire departments as inconsistent. This lack of accurate information is an obstacle not only to a complete assessment of fire problems, but to the design and implementation of effective fire prevention programs. In fairness, the reporting system is considered burdensome by some fire departments, yet due to financial constraints, no economic incentive is offered for reporting fire departments in Oklahoma.

OKLAHOMA FORESTRY DIVISION'S ROLE IN THE ISSUE

The Oklahoma Forestry Division's involvement with rural fire departments began in 1970, when it initiated its Cooperative Fire Equipment Lease Agreement program. Using authority granted through arrangement with the USDA - Forest Service, it began limited distribution of federal excess property to fire departments for use in wildland fire suppression activities.

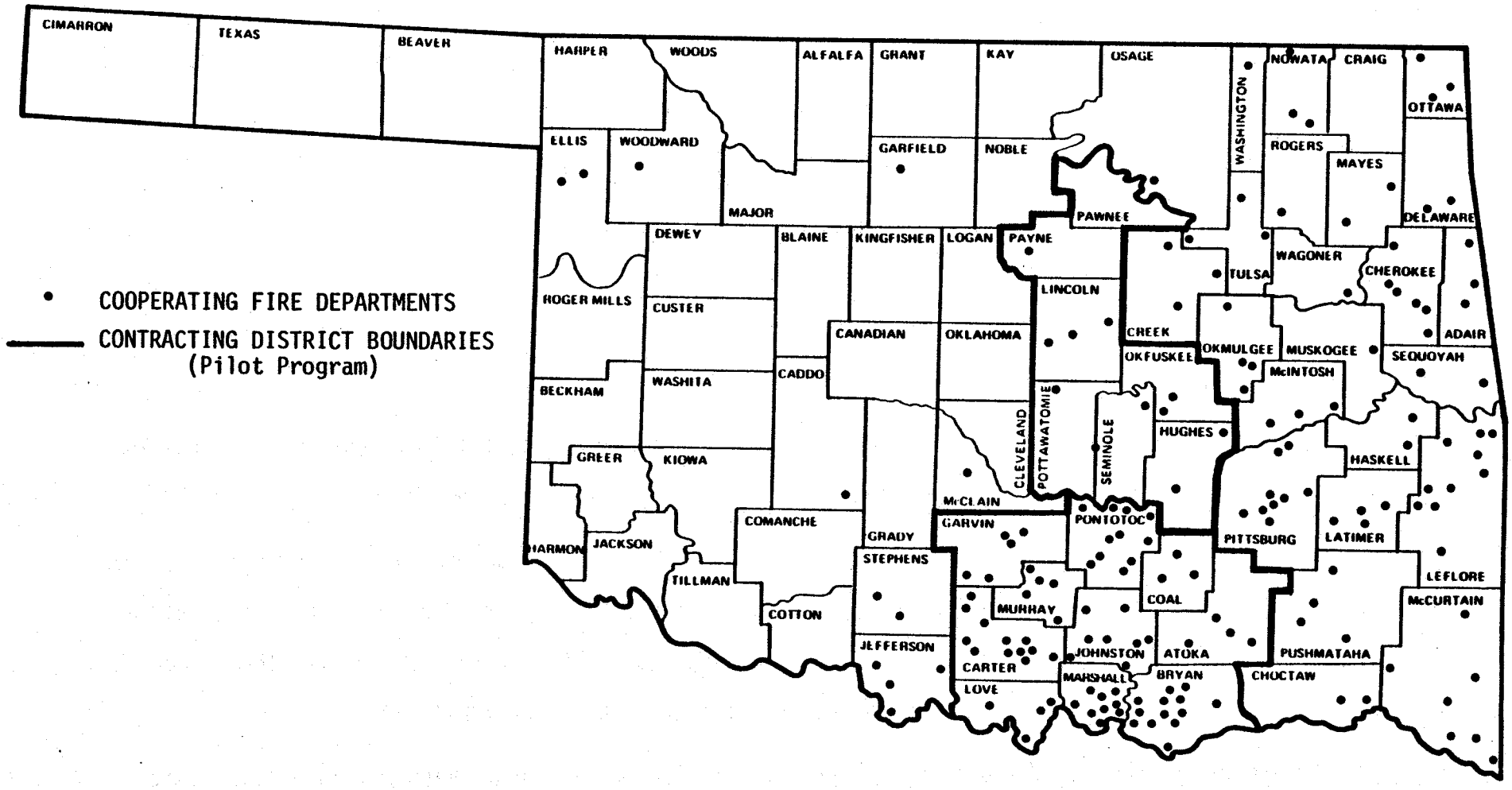
Under the terms of the cooperative agreement, the Division "loans" trucks, pumps, tools, clothing and miscellaneous equipment to fire departments, requiring in return only the maintenance, insurance and use of the equipment for fire protection service exclusively.

Recognizing the potential of such a program, and the extreme need for improved protection in rural areas, the thirty-eighth Legislature, in 1981, appropriated 285 thousand dollars to begin a pilot project aimed at eventually providing improved fire protection statewide. Specific actions include the establishment of a central equipment distribution center at Goldsby, employment of full-time screeners to acquire excess property, a shop to make trucks operational, and contracts with two of Oklahoma's eleven Sub-state Planning Districts for hiring of District Coordinators.

The Forestry Division currently maintains Cooperative Agreements with over 180 rural communities, fire departments and fire districts. The majority of these lie within the Division's eastern "protected" region and in south-central Oklahoma (see map).

In addition to supplying equipment, the Forestry Division provides some funding to rural fire departments for equipment, training and/or organizational planning. Public Law 92-419, Title IV, established the Rural Community Fire Protection (RCFP) program. Up until FY 1982, the RCFP program was 100% federally-funded, and

RURAL FIRE DEFENSE PROGRAM



offered 50% cost-share assistance of up to $3,000 to fire departments in communities of less than 10,000 population. In the face of threats that federal funds would be cut in FY 82, the Forestry Division asked for, and received, a state appropriation of $96,000 to carry on the program. To date, $560,000 in RCFP funds have been distributed to 180 different rural fire departments in Oklahoma, assisting in the expenditure of over 1.2 million dollars for fire equipment, materials, supplies and training.

RELATED PROGRAMS AND ACTIVITIES

State Fire Marshal's Office - Maintains the leadership role among the professional fire service organizations in Oklahoma. Keeps fire occurrence and loss records of reporting fire departments. Investigates suspicious fires and inspects buildings and premises for fire safety. Is available to assist rural fire departments in a number of fire related activities.

OSU, Fire Service Training - Provides education and training to firemen on all phases of fire suppression and prevention. Consults and makes recommendations to other fire related agencies.

Oklahoma Civil Defense - Provides assistance to rural fire departments in obtaining and improving equipment through surplus property. For several years, CD had authorization to acquire federal excess property, and through this authority, placed a great deal of fire fighting equipment in rural communities throughout the state. Civil Defense units still provide fire protection over much of rural Oklahoma.

State Surplus Property Agency - Has placed a great deal of property in rural volunteer fire departments over the years. This agency has mandated authority to screen and acquire property only after it goes through federal excess property channel, thereby reducing the amount of useful property it can obtain. Among the differences in the excess and surplus property programs is that title to surplus property is

transferred to the receiving community once certain stipulations have been met, while excess property remains in the ownership of the granting agency.

Sub-state Planning Districts - There are 11 sub-state planning districts in Oklahoma. Each district is involved to some extent in planning for fire protection within its boundaries. Some districts are also actively involved in implementing activities to improve fire protection capabilities of the fire departments they serve.

Wood Energy

ISSUE: Increased demand for wood as an energy source has increased interest and activities in technology and marketing.

BACKGROUND CURRENT SITUATION

As the price of fossil fuel continues to rise, so does the market demand for fuelwood, and the resulting opportunities for advancement in fuelwood technology and marketing abound. On the other hand, concern is growing over the effect extensive firewood cutting might have on Oklahoma's forest lands and over the potential air quality problems caused by woodburning.

Oklahoma's forest lands contain an abundance of poor quality hardwoods having little or no commercial value. There are thousands of acres throughout the state occupied by non-commercial forests, and these lands, when properly managed, can be used not only for firewood production, but for recreation, wildlife and range. But, far too often, firewood is harvested from non-commercial forestlands with no other objective in mind. The situation is similar on the commercially forested lands in the state, as trees better suited for purposes such as timber or mast production are frequently cut for burning.

Availability of firewood varies in each region of the state. In eastern Oklahoma, numerous public and private forestland owners maintain an "open" land policy toward firewood cutters, often requiring only verbal or written approval. In western Oklahoma and in urban areas, where forested land is more scarce, "free" firewood is not so readily available, which not only gives support to local retail firewood sales, but provides forestland owners with wholesale marketing opportunities.

Market prices for firewood vary in accordance to its availability and to the relative demand. For example, in the metropolitan areas of Tulsa and Oklahoma City, the delivered price of a "rick" or "face-cord" of firewood in 1980 ranged from $40 to more than $60. Western Oklahomans paid a similar price, unless fortunate enough to own their own woodlots. On the other hand, in eastern Oklahoma, where availability is better, firewood sold for as little as $15 per rick.

The high demand for fuelwood has increased interest among some landowners in establishing "fuelwood plantations," particularly in and around the state's larger cities and in areas where trees are scarce. Grown on short rotations with the proper species, returns on initial investments can be expected within five to seven years. One of the preferred species planted for fuelwood in Oklahoma is black locust. Because of its fast growth and high BTU output, it is especially well suited for this purpose.

Another source of "energy wood" is urban waste. Wood from dead and dying trees, construction debris, used pallets, wood from cleared land and "trash" can all be used for energy production. Estimates from other states are that 40% of the material hauled to landfill dumps is reusable wood. Yet, sorting, handling and reducing this material to a uniform size are major obstacles to its utilization for energy production.

Technological improvements in woodburning systems, coupled with increasing costs of fossil fuels, has resulted in many industries, schools, hospitals and others taking greater interest in supplementing traditional energy systems with wood. Such developments as wood pelletizing, wood gasification and methanol production are relatively new in the energy field. Other opportunities exist. Utility companies, for example, currently using or converting to coal can supplement their fuel mixes with up to 20% wood by making minor modifications to their equipment. In addition, five plants in Oklahoma (Blackwell, Vinita, Kingfisher,

Ponca City and Stillwater) use steam for electrical generation and wood could be used as a supplement in their fuel mixes.

Over 370,000 tons of bark was generated in 1978 by Oklahoma sawmills, of which 89% was utilized (mostly by forest industry to generate its own power requirements). In addition, sawmills generated some 31,277 cu. ft. of wood residues other than bark, of which about 95% was utilized. The potential for utilizing logging residues for energy exists in some areas, particularly southeastern Oklahoma, but feasible methods to gather, process and transport it have yet to be developed.

Burning wood creates relatively minor gaseous air pollution problems, yet pollution from particulate matter (ash) may be of concern, particularly in highly localized areas. Oklahoma's current air quality standards require major investments in pollution control equipment prior to utilizing wood for large scale power generation.

OKLAHOMA FORESTRY DIVISION'S ROLE IN THE ISSUE

Although the Oklahoma Forestry Division promotes the use of wood for energy, in working with private non-industrial forestland owners, OFD foresters encourage proper cutting practices in existing stands so as not to degrade their quality. In western regions of the state, OFD foresters encourage farmers and ranchers to manage their older windbreaks and shelterbelts, utilizing trees cut from them for fuelwood. The use of trees for fuelwood, particularly in the implementation of timber stand improvement practices, has increasingly become one of the multiple-use objectives addressed in developing forestland management plans for landowners throughout the state.

Technical assistance is given to landowners wishing to establish "fuelwood plantations" or firewood

lots. In 1980, the Forestry Division's State Tree Nursery at Goldsby distributed 39,800 tree seedlings to landowners for future firewood production, down from 68,000 trees in 1979. However, annual sales for this purpose have been and are expected to continue increasing as the costs of other energy sources rise.

Because increased fire hazard is a major factor in the use of fuelwood in the home, the Forestry Division offers brochures and pamphlets to homeowners in an effort to educate them on the proper installation of woodburning stoves. Information concerning the preferred species--their heating values and burning characteristics--is also distributed to the public.

RELATED PROGRAMS AND ACTIVITIES

Forest Industry - Forest industries located in Oklahoma usually allow wood cutting on designated areas of their lands upon request. In addition, one industry, the Weyerhaeuser Company, is presently utilizing sawmill and other waste to generate electrical energy.

Oklahoma State University Extension Service - In cooperation with the Oklahoma Department of Energy, OSU extension has published an extensive set of "fact Sheets" dealing with the use of wood as a home heating alternative. This comprehensive series contains information on practically every aspect of wood heating and is of great value to homeowners and others considering this alternative.

Others - Many forestry and conservation agencies in the state have made efforts to develop and encourage the use of wood as an energy source. Among these are the Soil Conservation Service, the Oklahoma Conservation Commission's Conservation Districts, Oklahoma State University's Department of Forestry, the U. S. Department of Agriculture's Forest Service, and Resource Conservation and Development Districts throughout the state.

Trees for Protective Purposes

ISSUE: Oklahomans are presented with many and varied opportunities to use trees for protective purposes.

BACKGROUND CURRENT SITUATION

The 1930s were desperate years in Oklahoma's history. Agriculture was in a relatively primitive state-of-the-art, and the lack of sound conservation measures took its toll, as drought and high winds wrecked havoc over the state, turning once productive farmland into semi-desert.

But, for all their devastation, the Dust Bowl days gave birth to a new type of forestry--"plains forestry"--when it was demonstrated that trees could aid in reducing wind and water erosion.

The birth of the "shelterbelt" occurred on July 11, 1934, under an executive order of President Roosevelt, allocating $15,000,000 from the Emergency Act of June 18, 1934, to be used for emergency relief in the drought-stricken midwest. The action was objected to by the Budget Director and the Controller. A million dollar compromise was agreed upon, which sum was considered sufficient for one year's operation. The Prairie States Forestry Project received final approval on October 10, 1934, and included an area from North Dakota to Oklahoma. Over the seven year life of the program, about 20 million trees were planted in 3,000 miles of windbreaks and shelterbelts on over 5,000 Oklahoma farms. The first windbreak planting in the nation under this program was established in 1935 on a farm near Mangum, Oklahoma.

In years following the Dust Bowl, other tree planting initiatives have come and gone. Such programs as the federal Soil Bank Program (1956-1961) gave some impetus to "protection plantings," but resulted in only

2,345 acres being planted in Oklahoma. The Agricultural Conservation Program (ACP)--continuously funded since 1936--has been one of the more successful government programs, in terms of total tree planting accomplished in Oklahoma. To date, over 24,000 acres have been planted using ACP cost-share assistance--many for the purpose of protecting the soil.

Seldom is there massive soil displacement on lands where sound conservation measures have been instituted. Practices such as cover-cropping, terracing, limiting grazing and windbreak planting have done much to keep erosion in check. However, man's activities and his inadequate precautions frequently cause very significant localized problems. Although the "lighter" soils in western Oklahoma are more susceptible than those in the east, erosion is an identifiable problem statewide, particularly along roadsides, around construction areas, on overgrazed pastures, on plowed cropland, on mining spoil banks, and along lake shorelines. In some of these areas, tree planting has proven to aid in reducing soil movement. Furthermore, these plantings, once established, provide a multitude of secondary benefits.

Windbreaks and "critical area" plantings provide livestock with shelter, landowners with posts and fuelwood and wildlife with habitat. When planted around homes and outbuildings, they make working conditions more comfortable, screen off unsightly views, increase real estate values, and conserve energy by substantially reducing home heating and cooling costs.

In spite of all this, during the 1960's and 1970's the attention of most landowners turned to increased crop production and more efficient harvesting methods. An apparent trend was to remove existing windbreaks in order to make available more farmland and utilize larger and better equipment. This prompted a study,

the results of which showed little cause for alarm, as approximately 78% of the original windbreaks planted in the state are still intact.

Further, current windbreak planting in the state is holding steady. In 1980 over 804,000 trees were planted for this purpose. Adding to the acceptability of today's modern windbreak is that it generally consists of only two or three rows and takes relatively little land out of production--a sharp contrast to some of the 12 to 15 row plantings of the 1930's.

On the other hand, tree planting for gully stabilization and other "critical area treatment" falls far short of its potential application. In fact, less than 200 acres were planted for this purpose in each of the past three years.

A statewide roadside erosion survey is currently being conducted to identify the areas having critical erosion problems. When completed, accurate quantitative estimates of the potential for planting trees to aid in controlling erosion can be made.

Western Oklahoma's semi-arid climate presents some major problems to the survival of newly planted tree seedlings. The recent development of "drip irrigation" systems, however, has done much to improve survival rates, particularly on poor soils and during periods of prolonged drought.

OKLAHOMA FORESTRY DIVISION'S ROLE IN THE ISSUE

The Oklahoma Forestry Division employs five foresters whose primary responsibility is to provide landowners in central and western Oklahoma with forestry assistance. They are supervised by an Area Forester headquartered near Goldsby, at the State Tree Nursery. Many of these foresters' activities center around tree planting for protective purposes. They provide such technical forestry assistance as species selection,

site selection and management planning for both "critical area treatment" plantings and windbreak establishment. In addition, they inform landowners of the multiple use benefits associated with these plantings.

One program with which central and western Oklahoma foresters are involved is the PL-534 Flood Prevention Project on the 4.8 million acre Washita River Basin. Under this program, forestry assistance is provided to landowners for tree planting for erosion control, soil stabilization and watershed protection, as well as for a variety of other forestry activities, including timber stand improvement and timber harvesting. The outlook for funding PL-534 past 1983, however, is dim.

The federal Agricultural Conservation Program (ACP) is available in every county in the state. In most counties--at the discretion of the county Agricultural Stabilization and Conservation (ASCS) committee--tree planting and timber stand improvement are components of ACP. However, decreasing federal funding for ACP has resulted in many county committees becoming increasingly reluctant to cost-share with landowners on forestry practices, as most western counties are more oriented toward farming and ranching. The Forestry Division provides technical assistance for forestry components under ACP and Division foresters spend a portion of their time administering it. The primary goal of the ACP is soil conservation.

The Division maintains cooperative agreements with most of the state's Conservation Districts and works closely with the Federal Soil Conservation Service (SCS) in providing technical assistance in the use of plant materials in conjunction with structural measures for critical area treatment.

Recognizing the sometimes severe mortality rate of newly planted tree seedlings, OFD has promoted the use of "drip irrigation" systems to reduce the effects of drought. Future plans are to further improve survival by offering "containerized" seedlings for some tree species planted for protective purposes.

RELATED PROGRAMS AND ACTIVITIES

Oklahoma Conservation Commission - Administrating agency of the 89 Conservation Districts across the state. During the 1970's, OCC sponsoring a statewide media campaign and was highly successful in increasing windbreak establishment.

Soil Conservation Service - The SCS provides technical service to landowners through 89 state and locally administered Conservation Districts across Oklahoma. The SCS is the primary technical wing of the ACP, which offers cost-share assistance to landowners for the establishment of windbreaks and erosion control plantings.

Oklahoma State University, Extension Service - County agents in each of Oklahoma's 77 counties provide information service. Among the information are "Fact Sheets" and brochures dealing with tree planting for windbreaks and critical area treatment.

Agricultural Stabilization and Conservation Service (ASCS) - Administers cost-share funds under ACP. The state office in Stillwater can "encourage" program emphasis, but county ASC committees have local authority for program development.

Trees for Specialty Purposes

ISSUE: There is growing interest and increasing activities in Christmas tree production, wildlife habitat improvement, and the many other specialized uses of trees.

BACKGROUND CURRENT SITUATION

Many Oklahoma landowners find that tree planting for specialty purposes is compatible with other land-uses. And in some instances, these plantings are a viable alternative to more traditional land-uses.

Growing Christmas trees, for example, is an alternative land-use which shows great promise in Oklahoma. Because of the long growing season and favorable climate, the state provides excellent opportunities to those inclined to enter the business. Yet, even as growing conditions are good, few landowners are actively growing Christmas trees. Consequently, the market for state-grown trees is undeveloped.

Although many thousands of native cedar and pine are cut and used for Christmas trees each year , the annual "commercial" harvest of trees for this purpose is only about 1,000. Consequently, Oklahoma is a net importer of Christmas trees. Oklahoma-grown Christmas trees are generally sold on a "choose-and-cut" basis, allowing the buyer to select his tree while it is still standing in the plantation. While producers' costs are lowered by this method of marketing, it is one reason that Oklahoma-grown Christmas trees seldom appear on commercial tree lots and in supermarkets, where thousands of out-of-state trees are sold annually. Little change is expected in this situation unless production in Oklahoma increases to a point that the "choose-and-cut" method of marketing is no longer adequate to move the state's crop.

An obstacle to increasing production of Christmas trees is the intensity of management required to

produce a high-quality crop. Growers must devote much time for cultural operations such as mowing, weeding, controlling insects and disease and pruning or shaping their trees. Time is also required for harvesting and marketing their final product, particularly in "choose-and-cut" operations.

Because of these requirements, many landowners who embark upon growing Christmas trees--fully intending to harvest their crops five to seven years after planting--find they lack the time or commitment to see through their endeavors. Hence, the failure rate among one to three-year-old Christmas tree plantations is greater than one-half.

Nevertheless, interest in Christmas tree production is increasing in Oklahoma. In 1980, the Oklahoma Christmas Tree Association was chartered. Made up primarily of families and individuals who have recently begun their plantations, its members hope to increase Oklahoma's share of the Christmas tree market, through sharing of their experience and knowledge.

Owing much to the environmental movements of the last decade, planting of "preferred" wildlife tree species in Oklahoma has increased tremendously, rising some 500% since 1970. Trees have long been considered of great value in providing food and shelter for both "game" and "non-game" wildlife. Among the tree and shrub species most commonly planted for habitat improvement are autumn olive, Russian olive, eastern redcedar, mulberry, black locust, plum and multiflora rose.

Some landowners still prefer wood fence posts cut from native trees to purchasing steel or treated pine posts. Though less prevalent than in years past, (only 5,000 trees were planted for this purpose in 1980). some continue to plant "post lots" to insure an abundance of the species they prefer. Such species as black locust, redcedar, osage orange, and mulberry are most commonly planted for this purpose. Border plantings

of multiflora rose are sometimes used in Oklahoma to form a "living fence." The natural hedge forms a nearly impenetrable barrier to livestock, precluding the need for an expensive wire fence.

Tree planting along the State's highway system is done to a limited extent--primarily for aesthetic reasons. In addition, some people plant dense evergreen trees between their property and roads, streets or highways to reduce noise and provide privacy.

As is obvious there are many special purposes for which trees are planted in the state. Some of the other notable purposes include plantings for urban wildlife habitat, energy conservation, snow fences, livestock shelter and arboretums.

Overall, specialty tree plantings have something in common--secondary or multiple-use benefits. As an example, trees planted for wildlife habitat improvement can also provide such benefits as fenceposts, firewood, livestock shelter, windbreaks, erosion control, recreation and aesthetic improvement. Benefits such as these can be derived from most any type of specialty tree planting when planned and carried out properly. Current trends in specialty plantings indicate landowners are discovering these benefits in increasing numbers.

OKLAHOMA FORESTRY DIVISION'S ROLE IN THE ISSUE

The Oklahoma Forestry Division's field foresters spend significant amounts of time assisting private landowners in establishing specialty tree plantings. A typical assist might consist of recommending proper tree species, selecting suitable sites, verbally instructing or physically demonstrating site preparation and planting techniques, developing a management plan for an individual's Christmas tree plantation, or a

variety of other activities associated with specialty plantings.

Verbal recommendations account for the bulk of assistance given to landowners seeking help with their specialty plantings, as OFD's foresters handle thousands of telephone calls and office visits annually.

In addition to providing technical assistance, a substantial number of the tree seedlings grown by the Forestry Division's nursery operations are sold for specialty plantings, accounting for almost fifteen percent of the total production. Leading the way is the sale of trees for wildlife habitat improvement, averaging about 470,000 trees annually over the past three years. The 1970's witnessed a major increase in the demand for seedlings for this purpose, and in response, OFD developed its "wildlife package," consisting of several "preferred" tree and shrub species and designed particularly for small private landowners. In addition, the Division cooperates with the Oklahoma Wildlife Conservation Department by supplying trees and shrubs for planting on lands under its control.

During the 1970's, there was a steady increase in the demand for tree seedlings for Christmas tree production. The interest in growing Christmas trees has now reached an all-time high, and is reflected in a 65% increase in seedling sales for this purpose in 1980. Oklahoma's State Tree Nursery supplied growers with more than 90,000 seedlings during the 1980-81 planting season. Records indicate that Scotch pine is the species most preferred by growers--mainly because of its wide acceptance and good marketability. But sales of Austrian pine for this purpose are becoming more significant each year, due to its drought tolerance and less demanding site requirements. Increased interest in Virginia pine prompted the Nursery to sow seed for this species for the 1982-83 planting season

The Forestry Division voluntarily prohibits the sale of its nursery stock for purposes other than those

related to forest production and/or conservation. And although its policy is somewhat loosely interpreted, the sale of trees for aesthetic purposes is generally discouraged. Instead, many landowners are referred to private tree nurseries which can supply their needs, thereby providing impetus into the private sector while promoting the planting of trees for this purpose.

RELATED PROGRAMS AND ACTIVITIES

OSU Extension - Through its field offices and headquarters in Stillwater, OSU Extension offers information assistance to landowners wishing advice concerning specialty plantings. It publishes fact sheets dealing with a variety of special subject areas including Christmas tree production, wildlife plantings, post lot plantings and livestock shelter. In addition, OSU Extension was the catalyst in the formation of the Oklahoms Christmas Tree Association and remains active in the group.

Conservation Districts and Soil Conservation Service - State SCD's and the federal Soil Conservation Service encourage planting trees for a variety of special purposes. Field personnel provide landowners with assistance in planning, species selection, site selection and planting techniques.

Oklahoma Department of Wildlife Conservation - The Department of Wildlife Conservation is active in planting trees and shrubs for wildlife habitat on their lands and lands under their control. In addition, the Department's rangers and biologists encourage private landowners in the state to plant preferred species on their lands through the Department's technical assistance programs and its "Acres for Wildlife" program.

Information and Education

ISSUE: Many Oklahomans are not aware of the role forests and trees play in their daily lives, nor of the opportunities existing for the management of their woodlands.

BACKGROUND CURRENT SITUATION

Forestry in Oklahoma contributes to and influences a wide range of social, environmental and economic issues within the state. Yet, its role is frequently not fully appreciated nor understood--often because of a narrow scope of understanding many people have concerning the complex relationship man maintains with plants and their environment.

The major concentration of Oklahoma's commercial forestland is in the eastern one-third of the state, away from current population growth centers and media organizations which dominate news selection. Not owing their livelihood to the continuous production of wood from these lands, many people visualize the commercially forested region as a "pristine wilderness," existing primarily as a recreational haven with unmatched scenic splender. And the news media, in general, has tended to reinforce this view, as the issue of intensive forest management is cast in terms of "protection" versus "abuse" by forest industries. Most people recognize the need to harvest standing timber from the state's forestlands to supply their wood product requirements. But, few recognize the tremendous pressures placed on these lands to supply an almost insatiable and ever-growing public demand for these products, nor of the many thousands of individuals who rely on the management of the forest for their incomes.

Throughout Oklahoma, citizens generally lack the knowledge and appreciation of how trees influence their

quality of life, whether for commercial timber production, windbreaks or fuelwood. The many benefits and functions of trees--such as air purification, noise reduction, climate control and soil stabilization--have not been adequately extolled through communication avenues to citizens. The evidence is obvious, as construction work, vandalism, improper care and general abuse continues to deplete and degrade shade and street trees in the state's towns and cities.

Many private non-industrial forestland owners in Oklahoma lack the know-how or ability to develop and manage their woodlands. Further, many are uninformed of the services available to assist them. Among those aware that services exist, some are confused by the bureaucratic network involved in seeking government assistance, or are uneasy, for one reason or another, about employing private consultants. Despite this, few concerted efforts have been made by members of the "forestry community" to define their roles and dispense information to the public on the services offered by each.

A further example of the inadequacy of forestry information in Oklahoma is the lack of a market information dissemination system for standing timber. Like other agricultural products, this market fluctuates greatly. Yet, unlike other agricultural producers, forestland owners are in the unique position of selling their crops when "the market is right." But the lack of up-to-date market information prevents landowners from keeping abreast of the price they can expect to receive for their products, and frequently acts as a disincentive to marketing altogether.

Information and education is an integral part of every issue facing forestry in Oklahoma. But, in no issue is it of more consequence than that of water quality. The portion of Oklahoma's Water Quality Management Plan dealing with forestry is based wholly on voluntary compliance to a set of "Best Management

Practices" (BMP's). If voluntary compliance cannot be attained, the federal government will impose regulatory action, creating, in effect, a "State Forestry Practices Act," applying not only to industrial forestlands, but to the thousands of private non-industrial forest holdings throughout the state. Inevitably, a massive thrust must be mounted to educate landowners and forest contractors of the BMP's, and of the consequences should they not be followed.

For the public at large, efforts have been made to raise the "profile" of the state's forestry industry and the benefits of trees in general through a consistent print media campaign during the past several years. While achieving a modicum of success, this effort can generally be characterized as "fragmented" because of a general lack of interest by the state's news media.

OKLAHOMA FORESTRY DIVISION'S ROLE IN THE ISSUE

Although the Oklahoma Forestry Division has no developed forestry information and education program, some efforts are made to disseminate information on the aspects of forestry with which it is involved. For example, Division foresters write localized news articles concerning forest management activities and cost-share programs available on private non-industrial lands. But, due to time constraints and program workloads, these efforts are generally fragmented and inconsistent. On the other hand, good efforts have been made by OFD's urban foresters to educate and inform the public of the benefits and environmental influences trees have on their lives, primarily through public speaking to civic groups and schools, and through newspaper articles. In addition, statewide news releases on a variety of forestry related subjects are produced by the headquarters office through the Department of Agriculture's Information and Education Division.

Comprehensive fire prevention education is a high priority in the Forestry Division's eastern field

offices. Three full-time Fire Prevention Officers, as part of their duties, conduct programs in schools, libraries, and at civic meetings. In addition, forest rangers frequently visit schools in their districts to conduct fire prevention programs as a part of their routine duties. Through use of the Cooperative Forest Fire Prevention and Rural Forestry Assistance programs, the Division purchases and distributes Smokey Bear and Woodsy Owl promotional material statewide.

Many owners of commercial forestland are absentee owners living in the state's metropolitan areas. In an effort to educate this group of the existing needs and opportunities to manage their woodlands, the Forestry Division, in cooperation with OSU Extension Service, conducted forest landowner conferences in Oklahoma City and Tulsa during 1979 and 1980. Both meetings were well attended and moderately successful in increasing forest management activities on absentee ownerships.

The Oklahoma Forestry Division is heavily involved in the implementation of the silvicultural aspects of Oklahoma's Water Quality Management Plan. As set forth in the plan, the Division, in conjunction with OSU Extension Service, is preparing to embark on a program aimed at educating private forestland owners and forest contractors of Oklahoma's Forestry Best Management Practices for water quality.

Brochures and publications concerning various aspects of forestry are frequently printed and/or distributed to the public by the Forestry Division's staff in Oklahoma City. The most successful of these efforts is the manual "Forest Trees of Oklahoma," last published in 1981. The manual was first prepared and published in 1927, and the 1981 edition is the twelfth edition.

RELATED PROGRAMS AND ACTIVITIES

Oklahoma State University, Extension Service - OSU Extension is the lead agency for information and education in the state; and through developed programs and publications, it is striving to meet the increasing need for forestry information and education. Among the more notable activities Extension is responsible for are it's "OSU Extension Fact Sheets," published on a variety of forestry subjects, and the annual Oklahoma Youth Forestry Camp (entering its 26th year). Extension employs three foresters--one each at Stillwater, Muskogee and Antlers--and they are involved in a myriad of information and educational activities.

Soil Conservation Service and Conservation Districts - The federal SCS has a developed I&E program that assists in "farm forestry" activities. It publishes brochures and other informational materials, mostly with a national or regional scope. Information generated and distributed by the Oklahoma Conservation Commission's 89 Conservation Districts, on the other hand, varies widely and tends to be more localized. Some print newsletters, informing landowners of such things as the federal and state programs available to assist them, while others have no information and education program at all. On a state level SCS and Conservation Districts have worked closely with other forest-related agencies to develop and implement campaigns aimed at increasing tree planting. A significant increase in windbreak planting paralleled one such campaign during the 1970's.

Forest Heritage Center - Maintains a role in providing information and educational services that reflect the role of forestry in the social and economic structure of Oklahoma and the South.

Oklahoma Forestry Association - Through its regular newsletter, OFA provides its members with information

concerning various aspects of forestry in Oklahoma.

USDA, Forest Service, Ouachita National Forest - Cooperatively works with the Oklahoma Department of Education and Oklahoma State University to train teachers in environmental education methods. Developed and maintains the Robert S. Kerr Memorial Arboretum and Nature Center along the Talimena Drive in eastern Oklahoma. Distributes informational media releases and brochures. Makes local contacts and presentations on forestry.

Appendix

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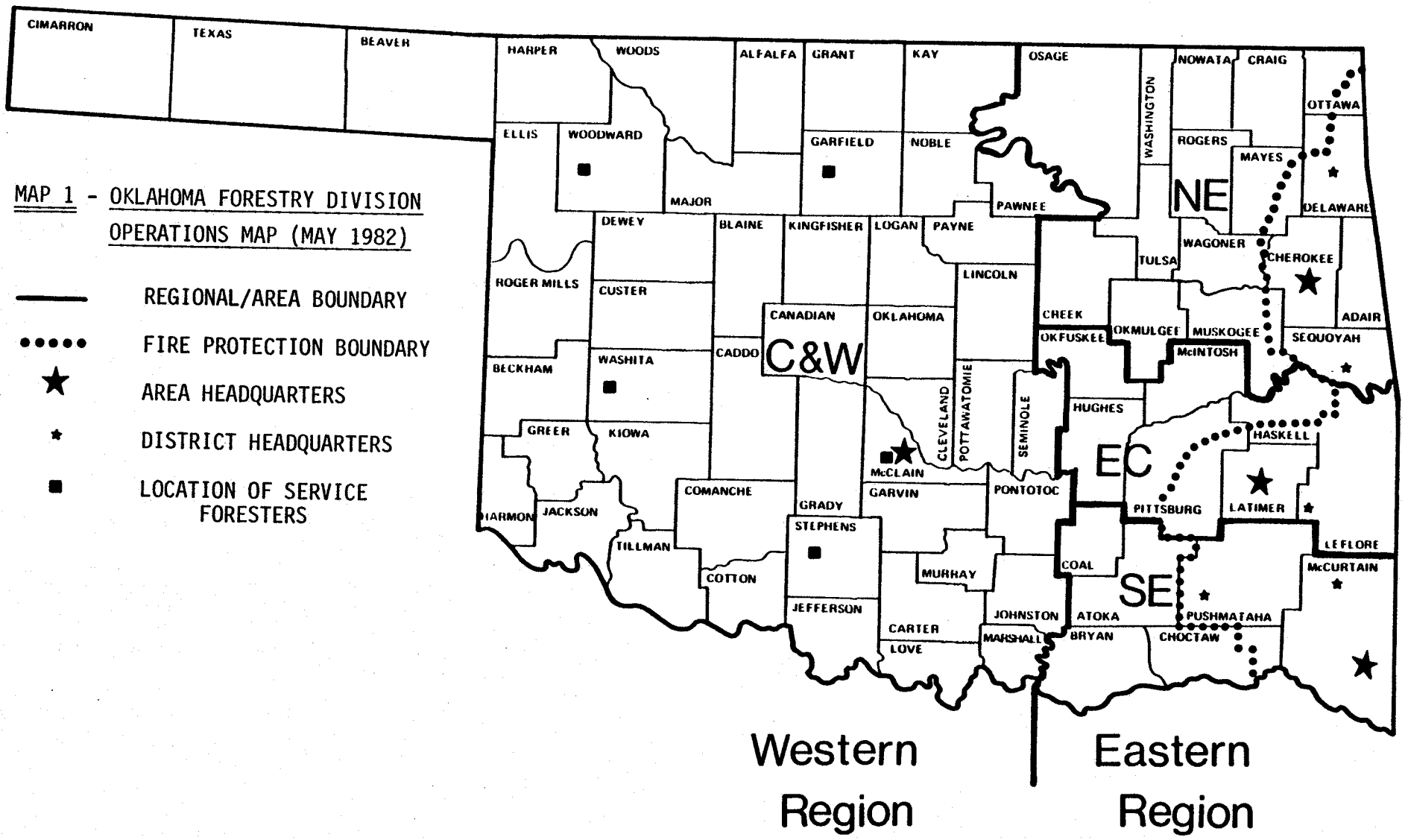
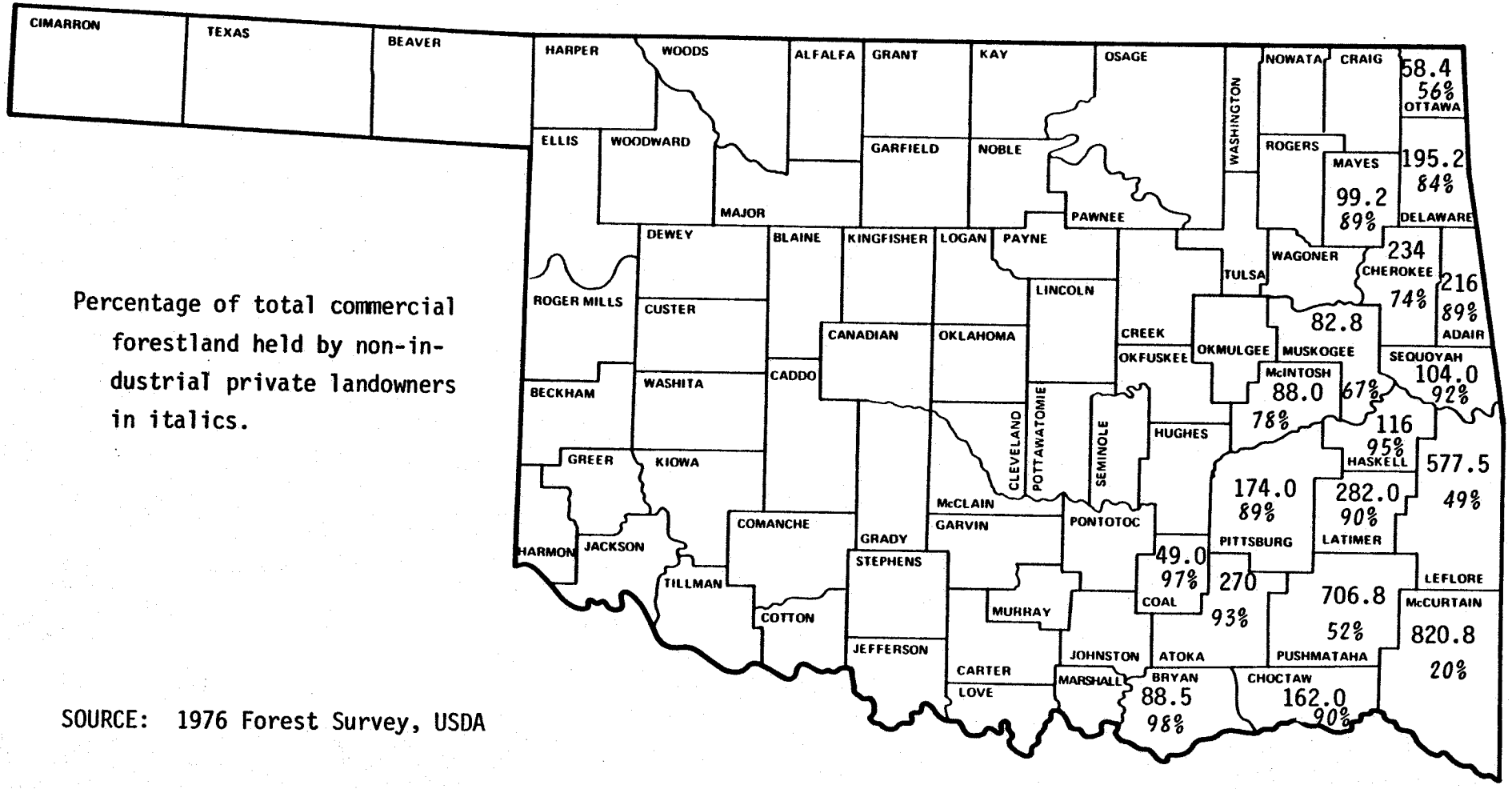
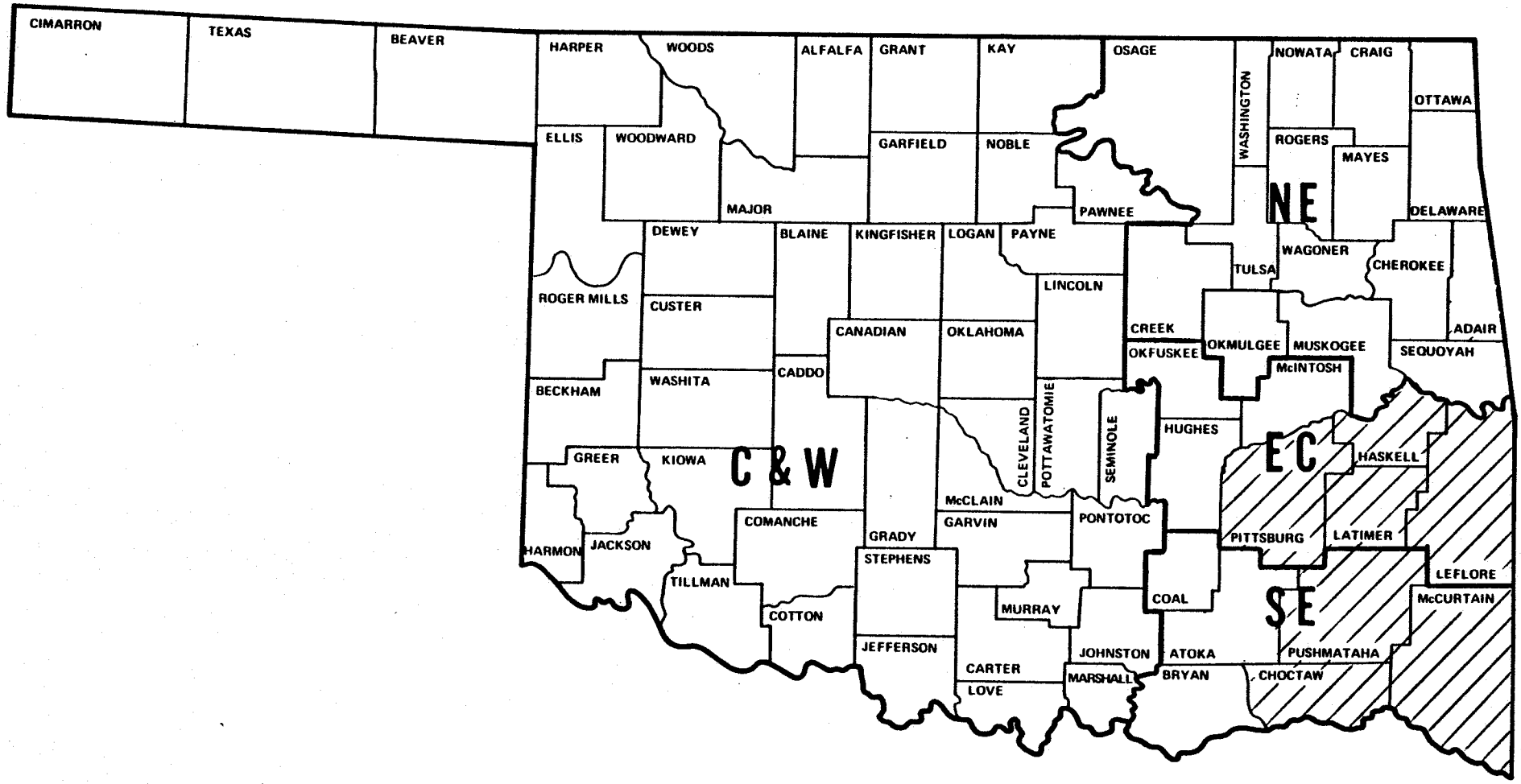

MAP 1 - OKLAHOMA FORESTRY DIVISION OPERATIONS MAP (MAY 1982)
REGIONAL/AREA BOUNDARY
FIRE PROTECTION BOUNDARY
AREA HEADQUARTERS
DISTRICT HEADQUARTERS
LOCATION OF SERVICE FORESTERS
CIMARRON
TEXAS
BEAVER
HARPER
WOODS
ALFALFA
GRANT
KAY
OSAGE
WASHINGTON
NOWATA
CRAIG
OTTAWA
ELLIS
WOODWARD
GARFIELD
NOBLE
ROGERS
MAYES
NE
MAJOR
PAWNEE
DELAWARE
DEWEY
BLAINE
KINGFISHER
LOGAN
PAYNE
WAGONER
TULSA
CHEROKEE
ROGER MILLS
CUSTER
LINCOLN
CANADIAN
OKLAHOMA
CREEK
OKMULGEE
MUSKOGEE
ADAIR
OKFUSKEE
SEQUOYAH
McINTOSH
BECKHAM
WASHITA
CADDO
C&W
CLEVELAND
POTTAWATOMIE
SEMINOLE
HUGHES
GREER
KIOWA
HASKELL
McCLAIN
EC
GARVIN
PONTOTOC
HARMON
JACKSON
COMANCHE
GRADY
PITTSBURG
LATIMER
LEFLORE
TILLMAN
STEPHENS
COAL
McCURTAIN
COTTON
MURRAY
SE
JEFFERSON
JOHNSTON
ATOKA
PUSHMATAHA
CARTER
MARSHALL
BRYAN
CHOCTAW
LOVE
Western Region
Eastern Region

MAP 2: ACRES OF COMMERCIAL FORESTLAND BY COUNTY (IN THOUSANDS) AND PERCENT NON-INDUSTRIAL PRIVATE



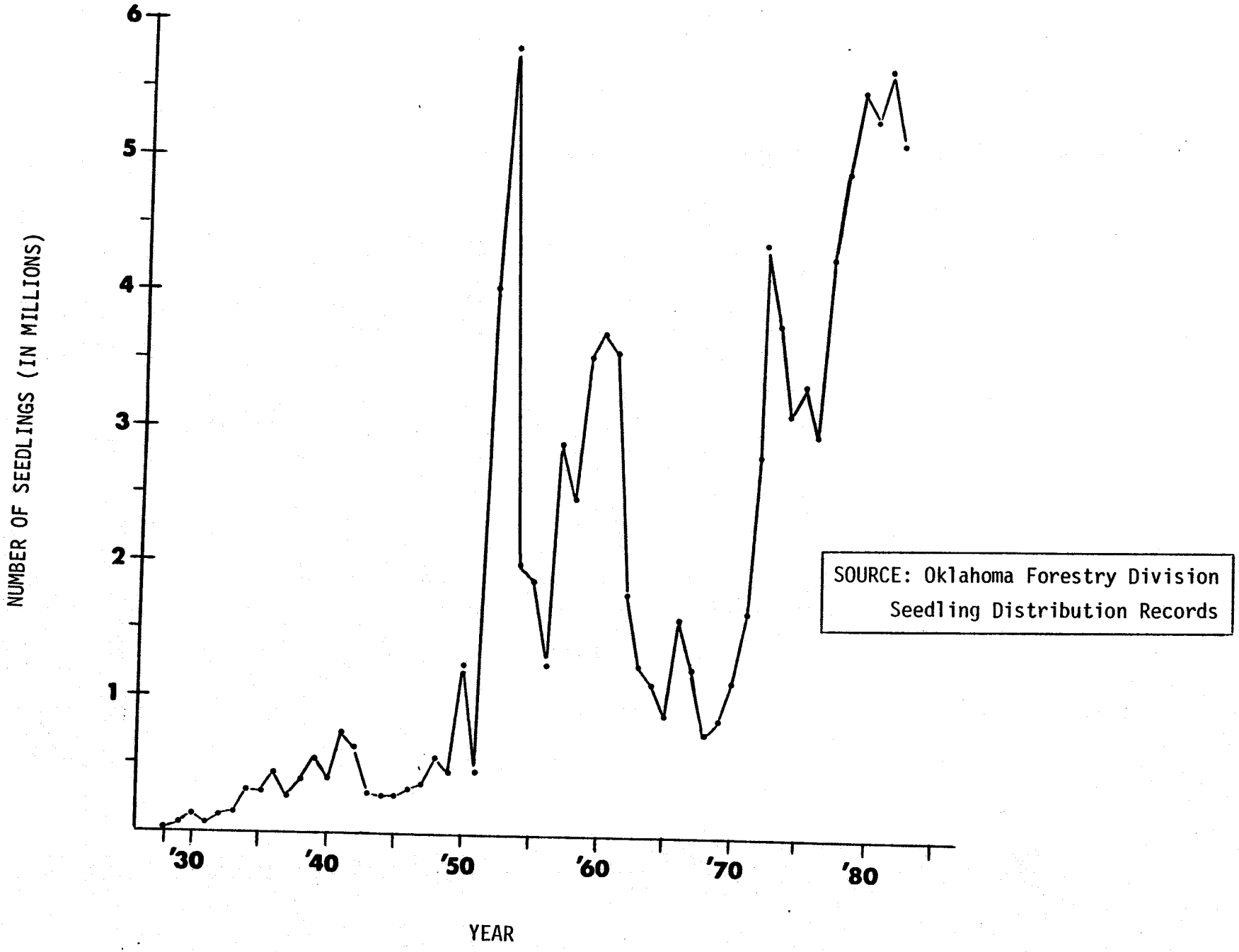
Percentage of total commercial forestland held by non-industrial private landowners in italics.

SOURCE: 1976 Forest Survey, USDA

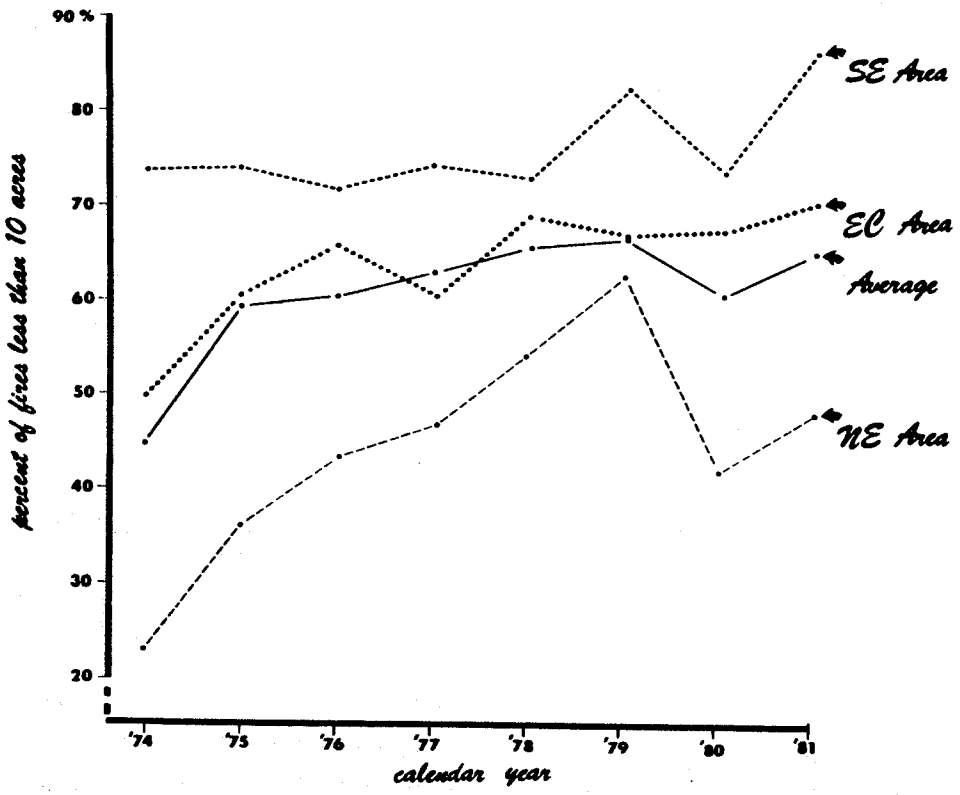


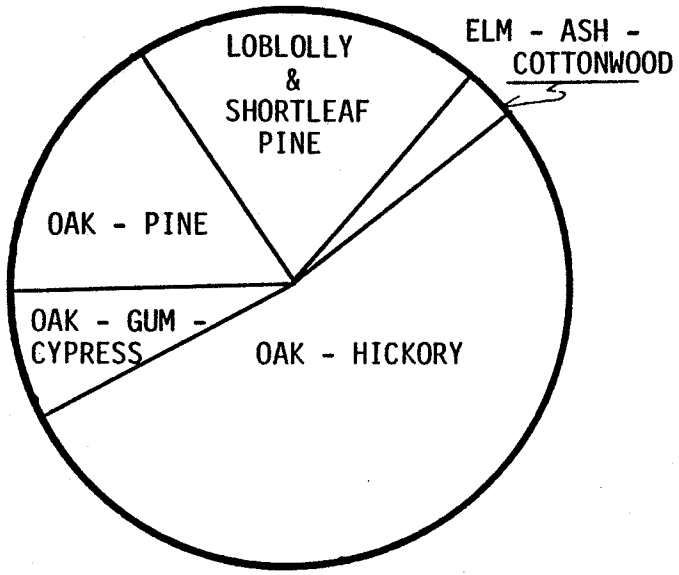
MAP 3: COUNTIES IN WHICH THE FEDERAL FORESTRY INCENTIVES PROGRAM IS OFFERED.

GRAPH 1: FORESTRY DIVISION'S TREE SEEDLING DISTRIBUTION (1928-1982)



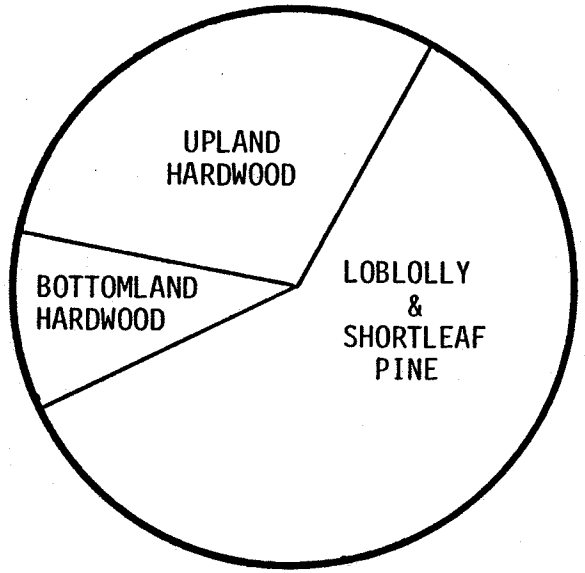
GRAPH 2: PERCENTAGE OF WILDFIRES IN PROTECTED REGION SUPPRESSED AT TEN ACRES OR LESS, BY ADMINISTRATIVE AREA (1974-1981)





GRAPH 3: EASTERN OKLAHOMA'S COMMERCIAL FORESTLAND BY FOREST TYPES

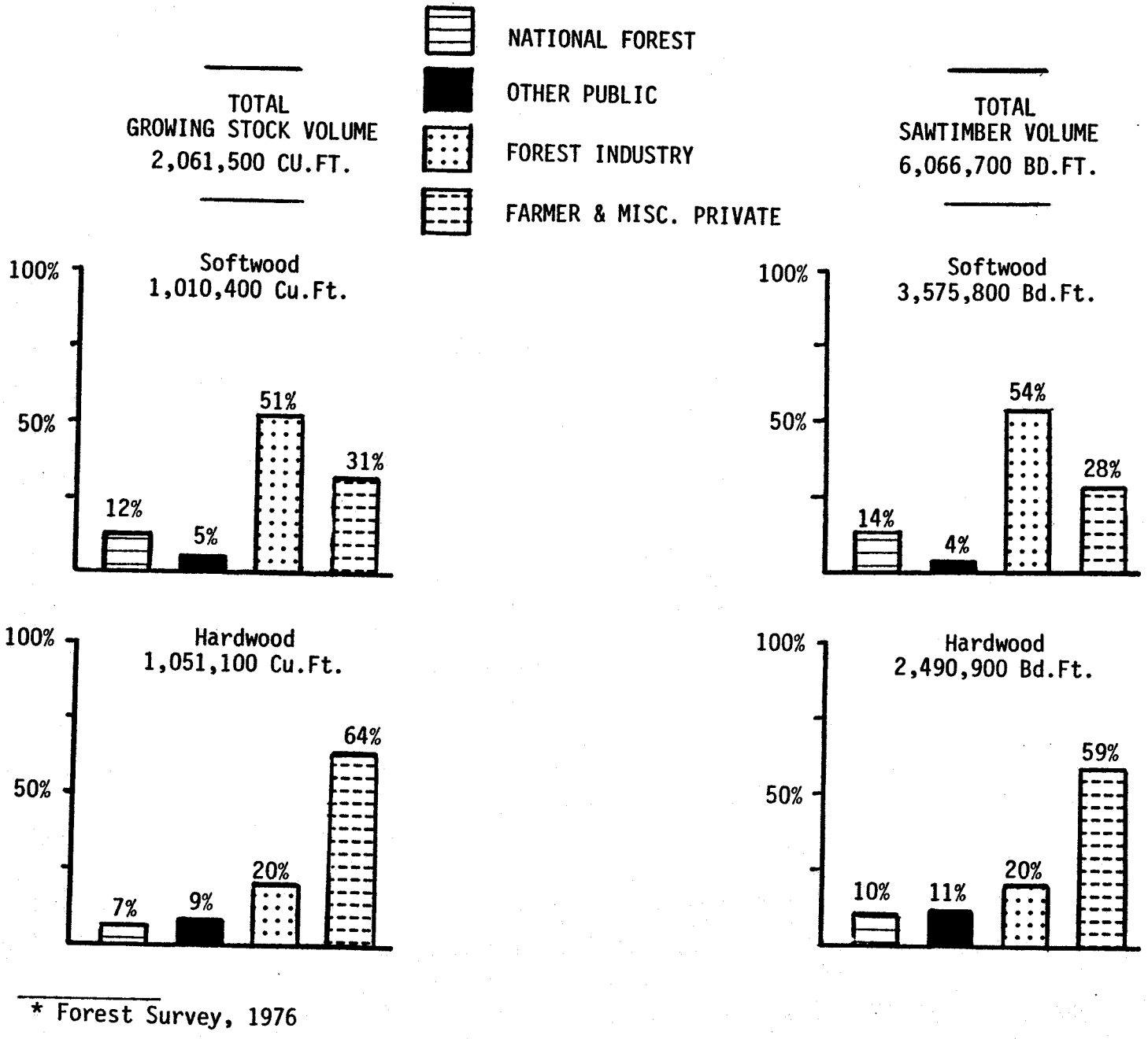
FOREST TYPE	ACRES	PERCENT
Loblolly-Shortleaf	847,300	20%
Oak-Pine	693,100	16%
Oak-Gum-Cypress	296,300	7%
Oak-Hickory	2,357,200	54%
Elm-Ash-Cottonwood	129,500	3%
	4,323,400	



GRAPH 4: EASTERN OKLAHOMA'S COMMERCIAL FORESTLAND BY PHYSIOGRAPHIC SITE

SITE CLASS	ACRES	PERCENT
Loblolly-Shortleaf	2,616,300	60%
Upland Hardwood	1,281,300	30%
Bottomland Hardwood	425,800	10%
	4,323,400	

GRAPH 5: VOLUME OF GROWING STOCK AND SAWTIMBER IN EASTERN OKLAHOMA'S COMMERCIAL FOREST, BY OWNERSHIP



* Forest Survey, 1976

TABLE 1: AVERAGE VOLUME PER ACRE OF GROWING STOCK AND SAWTIMBER ON COMMERCIAL FORESTLAND BY RESOURCE REGION, SPECIES GROUP AND OWNERSHIP CLASS, 1976.

Ownership Class	Growing Stock			Sawtimber		
	All Species	Softwood	Hardwood	All Species	Softwood	Hardwood
	----- Cubic Feet ------			-------- Board Feet ---------		
	OUACHITA HIGHLANDS REGION					
National Forest	921	580	341	3,456	2,332	1,124
Other Public	556	273	283	1,765	828	937
Forest Industry	735	522	213	2,431	1,940	491
Farmers	392	122	270	984	369	615
Miscellaneous Private	343	162	181	871	490	381
All Ownerships	521	298	223	1,589	1,052	537
	OZARK REGION					
National Forest	...	...	...	...	...	...
Other Public	304	23	281	795	30	765
Forest Industry	...	...	...	...	...	...
Farmers	345	63	282	927	255	672
Miscellaneous Private	353	17	336	795	71	688
All Ownerships	342	39	303	841	148	693

SOURCE: USDA, FOREST SURVEY, 1976

Glossary

Advanced Reproduction - Young trees which have become established naturally in the forest understory, or following a harvest.

Bare-root seedling - as opposed to "balled" or "containerized," seedlings whose roots are substantially freed of soil prior to transplanting.

"Best Management Practice(s)" - A technique or set of techniques designed to minimize adverse effects of land management practices on the environment.

Board Foot - The amount of timber equivalent to a piece 1'x1'x1" thick (= 1/12 of a cubic ft.)

Browsing (wildlife) - Feeding on the buds, shoots and leaves of woody growth and on herbage by livestock or wild animals.

Cambium - The layer of cells lying between, and giving rise to the wood and the innermost living bark-- the radial growth mechanism of a woody plant.

Clearcutting (Clearcutting system) A silvicultural system in which the old crop is cleared over a area of land and a new crop is established, generally planted.

Commercial Forestland - Forestland capable of producing 20 cu. ft. of merchantable timber per acre per year, and not withdrawn from such use

Commercial Species - Tree species currently or prospectively suitable for industrial wood products.

Critical Erosion Area - Abnormally rapid soil erosion in an environment disturbed by animal life, usually man, and due primarily to such disturbances.

Cull Tree - A tree not suitable for manufactured wood products because it does not meet certain specifications, (e.g. defects affecting strength, grade, appearance).

Diameter (DBH) - In reference to tree diameter, expressed in inches, outside bark, measured at 4½ feet above ground.

Edge (wildlife management) - The more or less defined boundary between two or more elements of the environment, e.g. field/woodland.

Even-aged forest - of a forest, crop or stand of trees having little or no differences in age.

Extensive Forestry (forest economics) - The practice of forestry on a basis of low operating and investment costs per acre.

Fire Cooperator - A local person, agency or organization, outside the fire control organization, who has agreed in advance to perform specified fire-control services, for which he has received advanced training, equipment or instructions.

Flash Fuel - Fuels, e.g. grass, ferns, leaves, and other "light" vegetation or debris that ignite readily and are consumed rapidly by fire when dry.

Forest Stand - A group of trees, generally of the same species, size and age.

Forest Survey - A survey to determine, on a given area, such data as soil conditions and topography, together with the extent, condition, composition, and constitution of the forests.

Fuel Type (fire control) - An identifiable association of fuel elements of distinctive species, form, size, arrangement or other characteristics, that will cause a predictable rate of fire-spread or difficulty to control, under specific weather conditions.

Growing Stock Volume - Net volume, in cubic feet, of trees at least 5.0 inches in diameter at 4½ feet above the ground, from a one foot stump to a minimum of 4.0 inch top diameter outside bark.

Hardwoods - Dicolyledonous trees, usually broad leaved and deciduous (non-evergreen).

High-grading - A type of exploitation cutting that removes only certain species (a) above a certain size and/or (b) of high value, with little or no regard for future crops from the same land.

Incendiary Fire - A fire unlawfully and/or maliciously set in order to burn property.

Intensive Forestry - The practice of forestry so as to obtain a high level of volume and quality of output per unit of area, through the application of the best techniques of silviculture and management.

Lumber - Sawn timber.

Mast (wildlife management) - The fruit of trees such as oak, beech, hickory and also seeds of certain pines, particularly where considered as food for wildlife.

Monoculture (silviculture) - Raising crops of a single species, generally even-aged.

Net Annual Growth - The annual change, resulting from natural causes in volume of sound wood in live trees.

Pesticide - Any chemical preparation used to control populations of injurous organisms, plant or animal.

Physiographic Site - A classification of land embracing soils, climate, topography, and other physiographic criteria, expressed in terms of suitability for growing certain species groups--pines, upland hardwoods, etc.

Progeny Test - A test in which the genetic constitution of an individual is evaluated from the performance of its progency produced by some specific mating system.

Protection Boundary (fire control) - The exterior boundary of an area within which a given agency has assumed a degree of responsibility for fire control.

Reforestation - Re-establishment of a tree crop on forest land.

Rick - A "stack" of fuelwood with a width equal to the length of individual pieces (no set width), 4 ft. in height and 8 ft. long - sometimes called a "face cord."

Riparian (adj.) - Of vegetation growing in close proximity to a watercourse, lake, swamp or spring.

Sawtimber tree - Live tree of commercial species, at least 9.0 inches in diameter at 4½' above ground for pine and at least 11.0 inches for hardwood, and containing at least one 12' saw log.

Second-growth Forest - Forest growth that has come up, usually naturally, after some drastic interference (e.g. wholesale cutting, serious fire, or insect attack) with previous forest.

Seed Orchard - A planted stand of trees managed for seed production.

Selection Cutting - A periodic removal of trees (usually the mature), individually or in small groups. Usually associated with "uneven-aged management."

Shelterbelt - See "windbreak."

Silviculture - The science and art of cultivating forest crops, based on a knowledge of the life history, physiography, physiology, and general characteristics of forest trees and "stands."

Site - An area considered in terms of its environment, particularly as this determines the type and quality of vegetation it can support.

Site Index - A measure of site class based on the height of the dominant (tallest) trees in a stand at an arbitrarily chosen age.

Slash - The residue left on the ground after harvesting, storm, girdling and/or poisoning. Generally consists of unutilized logs, branch tops, uprooted stumps, leaves, bark, etc.

Softwood - A conventional term for trees belonging to the botanical group Gymospermae, e.g. pine, cedar.

Stand (Silviculture) - A community of trees possessing sufficient uniformity of composition, constitution, age, spacial arrangement or condition, to be distinquishable from adjacent community, so forming a silvicultural or management entity.

Stocking - Number of trees per acre.

Stumpage, Stumpage Value - Standing timber - The value of timber as it stands uncut. The gross amount a landowner can expect to receive for the sale of timber after deduction of logging costs.

Supply (economics) - The quantity of a product or service coming on the market.

Thinning (silviculture) - A felling made in an immature crop or a stand of trees, primarily in order to accelerate diameter growth.

Timber Stand Improvement - A loose term applied to practices which modify or improve a stands composition, constitution, condition and growth. Usual purpose is to reduce competition between crop trees and those trees which are unneeded or unwanted for the available light, water and nutrients of a site.

Tolerance (ecology) - The ability of an organism to subsist under a given set of environmental conditions. (1) For trees, the tolerance of most practical importance is their ability to grow satisfactorily in the shade of, and in competition with, other trees. Example: southern pine is relatively intolerant to shade of competing vegetation. (2) For wildlife, it is its ability to adjust to different or disturbed habitats.

Understory - Plants growing under a canopy formed by others. As referred to in this plan, plants less than or equal to ½ the height of the dominant trees in the stand.

Uneven-aged (adj.) (silviculture/management) - Of a forest, crop, or stand, composed of intermingling trees that differ markedly in age.

Value-added (economics) - The sale value of output less the costs of input, comprising essentially the total salaries and wages, rent, depreciation and profit incurred at any stage in the production process.

Virgin Forest - Natural Forest virtually uninfluenced by human activity.

Wilderness - 1. (legal interpretation) An area established and administered by state, federal or local government in order to preserve its primeval condition for public enjoyment, under primitive conditions, and in perpetuity.
2. (Websters Dictionary) A tract or region uncultivated and uninhabited by human beings; an area essentially undisturbed by human activity together with its naturally developed life community.

Windbreak (shelterbelt) - A barrier, natural or artificial, maintained against the wind to protect soil, crops, and/or homesteads.