

LONGLEAF

THE LONGLEAF PINE STORY

by Thomas C. Croker, Jr.

Longleaf pine forests have always been important in the lives and fortunes of southern people. Indians hunted deer and turkey under these trees and gathered lightwood from the forest floor to warm their lodges. Early mariners waterproofed their sails with pitch boiled from longleaf heartwood by enterprising pioneers. Timbering operations have made millionaires and furnished lumber for humble homes and stately mansions. Many red, white, and black men have sweated, bled, and died harvesting the products of the longleaf forests.

The forest, however, has been more than a storehouse of goods for mankind. It has been a gigantic stage stretching across the Southland where centuries of human drama have been enacted. The longleaf pine story is a fascinating saga of southern history that has touched the



Wahlenberg, Longleaf Pine



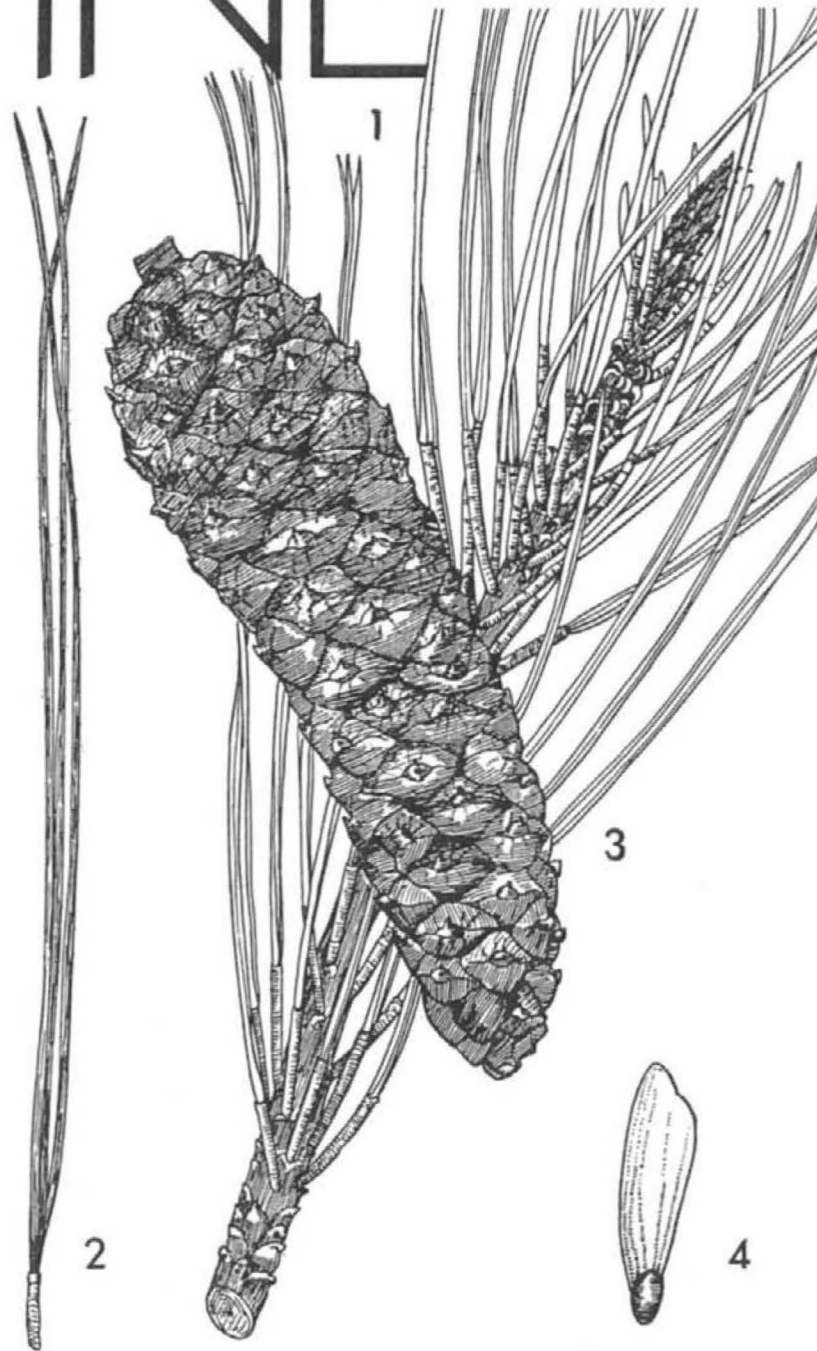
U. S. Forest Service photo, courtesy of the author

lives of millions. There have been times of great rejoicing and prosperity, but also grim times holding little hope for the future. In recent years the forests have been clearcut and replaced with other pines. The original virgin forest of some 60 million acres is gone, and there are now less than 10 million acres of second growth. Even this remnant is rapidly being destroyed. Recent developments, however, suggest that this trend can be reversed and a place in the sun found for the magnificent longleaf pine.

THE VIRGIN FOREST

Open and parklike, the virgin forest dominated some 60 million acres of the prehistoric southern landscape. Like huge wooden soldiers lined up in battle formation, the massive trees dotted the rolling coastal plains in a sea of grass. Gentle breezes, laden with a resinous perfume, rippled the long-strawed crowns and generated music both soothing to the ear and slightly mournful. Occasionally the tranquil scene was disturbed by a killer hurricane that

PINE



Harrar and Harrar, *Guide to Southern Trees*

Facing page: King of the southern pines, longleaf has been important in the lives and fortunes of southern people for centuries. The map indicates the approximate distribution of longleaf type forest and the northern limit of species occurrence. Above: 1) foliage, 2) needles, 3) closed cone, 4) seed.

crashed ashore from the sea, felling many veteran trees.

The forest, laced with narrow stream bottoms of hardwood and cane, provided an ideal habitat for deer, turkey, quail, and many other animals and birds. Beginning at the extreme southeastern tip of present-day Virginia, the natural range of longleaf pine extended across the Atlantic and Gulf Coast plains into east Texas, with brief excursions into the mountain and piedmont provinces of Alabama and Georgia. It was hemmed in by aridity on the west and by freezing temperatures and heavy soils on the north.

Fire was a natural architect of the forest. Ecologists classify longleaf pine as a fire climax type, meaning that the tree is maintained by regular fires. They speculate that the species' affinity for sandier soils is connected to its complex fire relationship. On such soils the ground vegetation consists of coarse, flammable grasses. Fires originally set by lightning, and later by Indians, frequently spread over thousands of acres in this fuel type. Longleaf seedlings, endowed by nature with supreme resistance to fire damage, found a compatible home in this environment. In fact, their very survival depended on these fires. Without them, aggressive hardwoods and pine competitors would choke out the longleaf. The open, parklike nature of the forest was due to the cleansing action of fire.

The forest was a bountiful storehouse of valuable wood products. Foresters have estimated that the original timber stands contained over 400 billion board feet of the strongest building material in America. In dead and down timber there was an abundance of pitchy heartwood unsurpassed for kindling, torches, house sills, and fence posts.

Admirably adapted to the southern environment by its resistance to fire, insects, and other hazards, longleaf pine stands were guaranteed continued renewal through natural processes. Many seedlings established on the forest floor by the infrequent seed crops escaped damage from the light surface fires. When mature trees were killed by lightning or felled in hurricanes, these seedlings sprang up to repair the break in the canopy.

MAN AND THE FOREST

The story of the first man to enter the longleaf pine forest is lost in centuries of unrecorded history. Since the forest apparently dominated such a large portion of the land, we can assume that it profoundly affected the earliest human inhabitants. We do know something of the activities of the Indians in this forest from journals of the first European visitors.

Longleaf forests provided many of the necessities of life for the woodland Indians of the southeast. Heartwood of longleaf pine furnished fuel

for warming and cooking fires. The warming fires were built on the ground in the center of the wigwam or lodge, and the smoke escaped through a hole in the roof. Soot that collected on the walls was scraped off and mixed with bear oil for war paint and other ceremonial painting. Lightwood splinters illuminated the way on various night excursions. Small trees and bark from the piney woods were used to construct corn cribs, lodges, and other small structures. Many of the village streets were paved with pine bark.

Deer furnished the Indians with food, shelter, and clothing, and deerskins became an important item of trade after the white man arrived. The longleaf pine woods provided an ideal locale for hunting the plentiful deer, which, when threatened by enemies, would hide in the narrow branch bottoms that penetrated the open woods. The hunters soon learned to drive the deer from their hiding places with fire, making death traps of the dense cane and hardwood bottoms. While their companions set the fires, the hunters hid behind the tree trunks in the open woods and slaughtered the terrified beasts as they rushed out to escape the flames. These hunting fires were not extinguished, and they spread throughout the uplands until stopped by a stream or by rain. Fires also were used sometimes as a battle tactic.

Wood products were important in many aspects of Indian ceremonial life, including funerals. Mourners blackened their faces with soot mixed with bear oil. The corpse was laid out in the sun on a pine pole frame, covered with pine bark, and treated with various mixtures. As soon as the flesh was mellow, it was removed and burned. The bones were then cleaned, oiled, and preserved.

The Indians' clearings for gardens and field crops rarely encroached on the longleaf pine forests. The native Americans favored the richer soils near streams rather than the sterile soils of the open woods. Moreover, until the white traders brought axes and other metal cutting tools, land clearing was a slow process. The larger trees could not be felled with primitive cutting tools; instead they were deadened by girdling or killed by piling heartwood around the tree base and setting it afire. No doubt many clearings reverted naturally to pine.

On balance the Indians did not materially change the character of the virgin forest. Their widespread use of fire helped maintain its open nature, and millions of acres of parklike stands stretched across the Southland when the white men came.

The first white men to enter the longleaf pine woods were Spaniards in search of gold. Typical of these was Hernando de Soto who, in 1539, came ashore in Florida from his base in Cuba with a large company of armor-clad soldiers. Many of their supplies were obtained by raids on

Indian settlements, but the conquistadors brought along herds of cattle and hogs to supplement their food supply. During their long journey through the Southland, some of these hogs strayed into the piney woods in search of food. Developing a taste for the nutritious pine roots, descendants of these strays became a serious menace to pine seedlings in later years.

English pioneers who came to the Atlantic coast of America were seeking homesites and farms rather than gold. Generally they settled in the bottomlands near the rivers, but the longleaf forests were important to them. These immigrants crossed the Atlantic in wooden ships whose seams and sails were waterproofed with pitch. They soon discovered that the heartwood of dead pines that had been accumulated for centuries was a rich source of this vital material. Production of pitch and tar became one of their first commercial enterprises. To extract the pitch, heartwood was cut and stacked in specially constructed earthen pits. Slow-burning fires boiled the pitch from the wood and it streamed into a barrel sunk in the ground outside of the perimeter of the circular pit. Tar was extracted from the pitch. Pioneer North Carolinians were especially active in this enterprise and were called "Tarheels," a nickname the state's residents bear to this day.

The settlers drew on the forest resources to construct their homes, outbuildings, and fences. Trees were cut down and pitsawn into lumber and building logs. Heartwood, virtually immune to decay, made ideal house blocks, sills, and fence posts. Pitsawing was a slow, laborious process. One man stood on a trestle above the log and handled a saw that cut only on the downstroke. The other man worked in the pit and got a face full of sawdust. Only a few boards were produced in a hard day's work.

The pioneers brought cattle, hogs, and work stock with them. These livestock were turned out into the woods for open-range grazing. The settlers, observing the hunting fires of the Indians, soon learned to set fires to green up the grass and control the movement of their cattle. (Cattle are attracted to the green grass in a new burn.) These fires, along with the grazing, helped to maintain the open nature of the longleaf woods. The hogs destroyed many seedlings, however, and the hot grazing fires occasionally did much damage.

The early white settlers created more numerous clearings than did the Indians, although land clearing by the latter increased with the axes brought by white traders. Most of these clearings, however, were located in the richer bottomlands and did not greatly diminish the longleaf forests.

Many writers have described the virgin longleaf forests and the life-styles of their inhabitants. William Bartram, the Pennsylvania botanist, traveled extensively on horseback through these for-

ests in North and South Carolina, Georgia, Florida, and Alabama in the late eighteenth century. He wrote of high, open forests of stately pines, with free circulation of air as contrasted with the troublesome cane swamps. Bartram mentioned the great herds of horned cattle, horses, and deer, and he noted that many areas recently had been burned by the Indians.

Congressman John F. Claiborne, later a federal timber agent, wrote of a trip through the longleaf forests of southern Mississippi in 1849: "For 20 miles at a stretch you ride through these ancient woods — a growth of giant pines unbroken . . . save where rivers or large watercourses intervene."

Historian Nollie Hickman described the early settlers in the longleaf pine forests of Mississippi as "stock raisers and hunters. Their country," he wrote, "was one great pasture where cattle and sheep fed upon wild oats and wire grass in the spring and summer seasons and upon reeds and canes of the bottoms during the winter months. Hardwood and pine mast provided food for large herds of swine. Throughout the woods were squirrels, turkey and deer in great numbers. Grass and wild game were the two fundamentals which determined the basic economy of the piney woods for the greater part of the nineteenth century."

THE TURPENTINERS

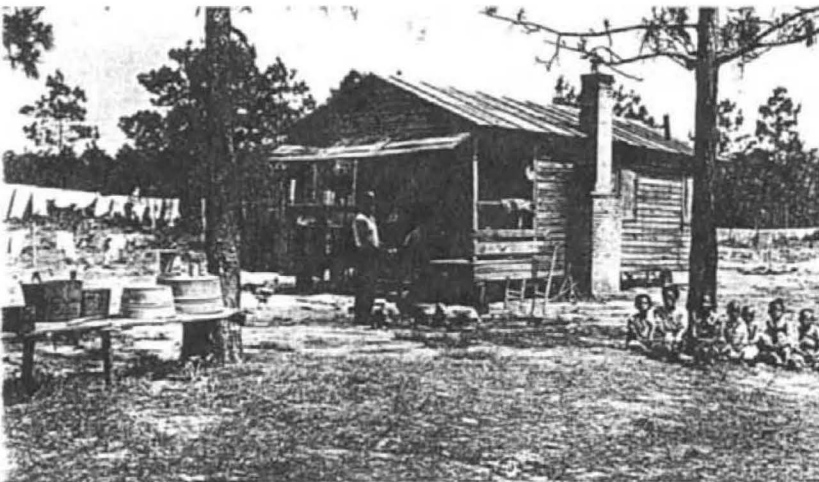
The first commercial enterprise of the European settlers in North Carolina was the production of pitch and tar. Just before the American Revolution a new method of producing naval stores was introduced. Living trees were tapped for their gum or oleoresin. Two valuable products, turpentine and rosin, were extracted from this gum by distillation.

To collect the gum a cavity or box was cut into the base of the tree. Above this box narrow streaks were cut in a V-shaped pattern across the face of the tree with a hook-bladed tool called a hack. This made the gum flow, and new streaks were cut each week during the growing season. After the boxes were filled, the gum was dipped into pails and then emptied into barrels for transportation to the still. At first all gum was shipped to England for distillation. About 1830 copper stills were introduced to the United States, and many new markets were developed for rosin and turpentine.

Until about 1838 the naval stores industry had not advanced south of the Cape Fear River in North Carolina. Most of the products were shipped from Norfolk, Virginia. There was a common belief among turpentiners that trees south of the Cape Fear River would not run gum. This superstition was unfounded, of course, and the industry expanded gradually throughout the longleaf pine belt.

The boxing method was very wasteful of timber and not very efficient. Around the end of the

TURPENTINERS



The Forest Service photos on this page depict various aspects of turpentine operations in Georgia and Florida during the 1920s and 1930s. Top left: Methods of wounding the tree to obtain gum changed with the introduction of cups and gutters and more conservative chipping techniques. Top right: A general view of a turpentine place showing the still in the foreground and workers' quarters in the background. Center:

Workers collect gum and load barrels for hauling to the still. Lower left: Typical quarters for a worker and his family. Lower right: An old-style fire still in which the progress of distillation is followed by listening to the sound of boiling gum at the tail pipe. Turpentine and water run into a separator barrel, then to a settling barrel, and finally the commercial product is piped to an oak barrel for shipment.

nineteenth century, several investigators, including W. W. Ashe and Charles H. Herty, were successful in developing a more conservative and efficient method. The new system employed shallow chipping, and a cup and gutter replaced the destructive box to collect the gum. At first clay cups were used, but metal cups later became popular. Use of the cup-and-gutter system achieved widespread use after 1910.

Lumbermen believed that the turpentine face would weaken the lumber, but this was disproved by Bernhard E. Fernow in 1893. After conservative chipping methods were developed by the Forest Service, it became customary for the naval stores people to face the timber just prior to cutting by the lumbermen.

To protect the turpentine faces from fire, the operators would rake a cleared strip around each tree and control-burn the area. These fires often destroyed newly germinated seedlings, as the block was usually burned annually. Sometimes there was a delay in the burning, however, and seedling stands became established if the first burn had come just before a good seed crop.

Until 1925 most naval stores were produced from longleaf pine timber. In later years the industry gravitated to slash pine stands, but much of the production also came from second-growth longleaf pine.

Naval stores laborers, mostly Negroes, lived in camps provided by the operators. Groceries, work clothes, and other supplies were secured from the commissary. Workers developed special skills, depending on their ambition and talents. The chippers were the highest-caste workers and took great pride in their ability to chip a crop (10,000 faces) in less than a week. Lower-caste workers, sometimes women and children, dipped and hauled the gum. Workers were supervised by woods riders, usually white men paid a daily wage by the operators. Recruitment of labor was a special problem, and each operator was alert to prevent "pirating" of his labor by others. Sometimes an unscrupulous operator would send some of his hands into another camp to lure laborers away. This was dangerous business, and occasionally the recruiters paid with their lives for such practice.

The cup-and-gutter system did not change much until after World War II. Forest Service researchers at Lake City, Florida, developed several new improvements, including bark chipping and chemical stimulation of gum, that have been generally adopted.

As long as the turpentiners merely worked faces on virgin timber a few years before it was cut, the impact on the forest was minimal, especially where the timber was protected from fire. Operations in second-growth timber can be very destructive, or they can fit in nicely with conservative cutting practice. In the latter case, additional revenue is provided and forestry practice is optimized.

Another form of naval stores operation is the extraction of turpentine and rosin from stumpwood in a factory. Stumpwood is the final contribution of the virgin forest to the southern economy.

THE RIVER ERA

Pioneer timbermen depended on water to transport their logs and power their mills. Trees were felled with pole axes and, if they were to be sold as timbers, squared with broad-axes. The logs were skidded to the stream bank and dumped in to be floated to the mill or ship.

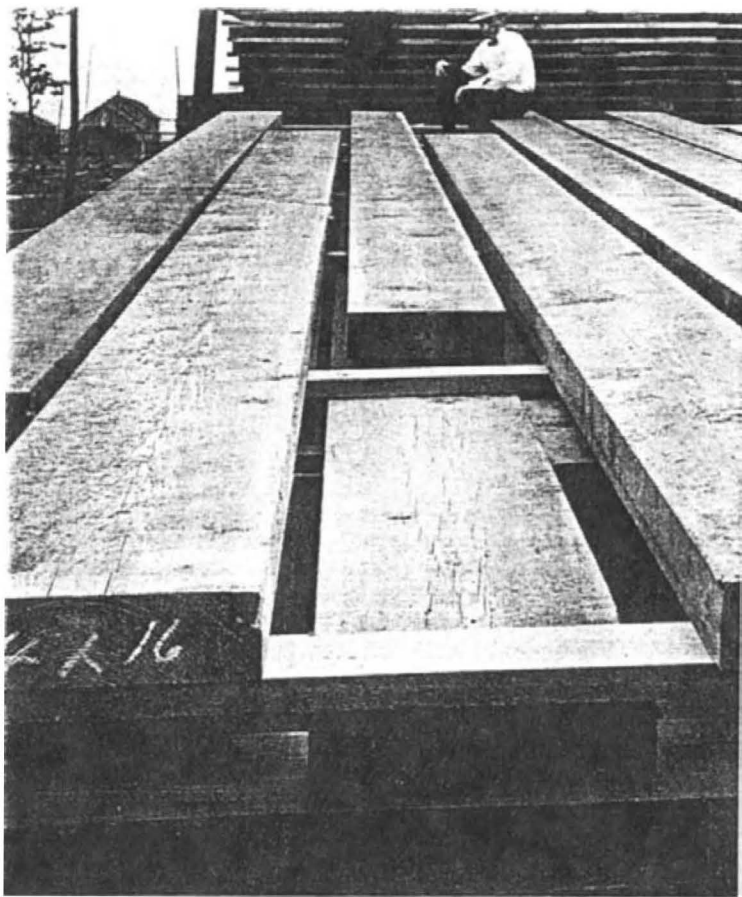
William Bartram described a typical operation on the Savannah River in Georgia during the late eighteenth century. His host escorted him to a steep riverbank where he had some men squaring pine and cypress logs that had been dragged to the site with "timber wheels." "Slaves of giant size mounted the massive logs," he wrote, "[and] the regular, heavy strokes of their gleaming axes echoed in the deep forest — while the sooty sons of Africa [sang] songs of their own composition." The squared timbers were then dumped into the river, made into rafts, and floated fifty miles down to Savannah, ultimately bound for the West Indies market.

The first mills were powered by water. Besides sawing lumber, many also ground corn and cleaned rice. Later the sawmills were powered by steam, but they were located near water so the logs could be rafted to them.

During the river era two distinct timbering operations developed — logging and sawmilling. The logmen cut and delivered the logs to mills where they were processed into lumber by the sawmillers. The sawmillers, who were usually better financed, advanced supplies and money to the logmen to be deducted from their pay when the logs were delivered.

In many cases the sawmillers controlled both logging and milling. An example was the Cedar Creek Lumber Company, which operated in southern Alabama during the late nineteenth century. On its vast timber holdings trees that would float were selected for cutting. The logs were floated in board ditches down Cedar and Murder creeks to the mill at Brewton. There they were square-sawn into "deals" for export to Europe. Deals were then floated down Murder Creek to the Conecuh River where they were assembled into rafts. A company man camped on the raft and piloted it down the river to Pensacola Bay and ocean-going ships. After delivering his timbers, he hiked the sixty miles back to Brewton.

The basic tasks of cutting trees and squaring timbers required great endurance and exceptional skill with the axe. A day's work was from "kin to kant," from first light of day until dark. As long as the timbermen used axes, they cut stumps waist high. After the crosscut saw was introduced,



FHS Collection

In the heyday of the yellow pine producers, much high-grade longleaf was earmarked for export markets. The lumber above was manufactured by the W. M. Cady Lumber Company, McNary, Louisiana.

less timber was wasted because stumps could be cut lower.

In the early days cutting was limited to the largest trees that would float. Trees scheduled to be used for masts, for example, had to meet rigid specifications. They must be twenty-six to thirty-six inches at the large end, eighteen to twenty-one inches at the small end, with a usable length of seventy-five to one hundred feet. Cutting was light because few trees qualified.

To move the logs to the river or stream, teams of oxen were employed. The drivers were masters at getting maximum efforts from their animals. They used rawhide whips to control the oxen. In the hands of an expert teamster, a whip would crack like a bolt of lightning near the ear of a recalcitrant beast, changing his direction or urging him to greater effort.

The practical skidding range did not exceed four miles, so cutting was limited to a narrow zone near the larger creeks and rivers where the water was deep enough to float the logs. Later board ditches were built into the lesser streams, and small dams were constructed to create ponds at the head of the ditches. After a supply of logs was skidded to the ponds, the gates were opened and the logs floated down to the river or mill.

Rafting in the longleaf pine country required considerable knowledge, and the logmen were subject to many difficulties. Log jams were a constant threat, and serious accidents were frequent. Droughts and floods were special hazards. Logs could not be moved during drought periods. On the other hand, floods sometimes carried the logs far back into the bottomlands where many were lost. Those that could be found had to be skidded back to the stream.

The river era gradually passed with the advent of railroad logging around the end of the nineteenth century. During this primitive period, longleaf pine and its products provided livelihoods for many thousands of Southerners, but the impact on the forest was minimal except in narrow zones near creeks and rivers. Large blocks of untouched timber remained in the backcountry, beyond the reach of the rivermen.

THE RAILROAD LOGGERS

As the nineteenth century waned, strange sounds were heard in the longleaf forest. The scream of locomotives, the din of power skidders dragging logs to railroad sidings, and the chant of track-laying crews signaled the start of a new era. Railroad loggers had come south in force to harvest a bonanza of yellow pine timber.

The red and white pine forests of the Lake States and New England were nearly cut over. Now the nation looked to the vast pineries of the South to satisfy urgent domestic needs and a demanding export market. The heyday of the longleaf pine lumber industry was reached in the first quarter of the twentieth century. The all-time peak production of yellow pine lumber was reached in 1909.

New logging methods were needed to reduce costs and step up production. To reach great blocks of timber in the backcountry, railroad logging was introduced. Spur lines were laid into the interior at quarter-mile intervals. Slow-moving oxen teams were replaced by powerful Clyde or Lidgerwood skidders that could handle five or six huge logs at a time. Skidders greatly stepped up production but were very destructive to young timber. There was little left following a skidder operation but a scarred and battered landscape.

The logs were piled alongside the tracks where a McGiffert loader would straddle the rails and load cars that passed underneath. Spur tracks were often carelessly built, so accidents were frequent. To keep the power movers supplied with logs, timber stands were cleared by great throngs of saw crews. To house these and other forest workers, lumber towns were hastily built throughout the longleaf belt. Many were shantytowns that were moved by rail from place to place as timber stands were exhausted. Others were more permanent and grew into modern towns and cities. Commissaries were organized to furnish

supplies for loggers in the more remote locations. Huge band mills were erected that could cut over 100,000 board feet in a single ten-hour shift. The first all-steel mill in the country was built by the Great Southern Lumber Company at Bogalusa, Louisiana. Cash registers rang merrily, and there was rejoicing at the prosperity flowing from the forests.

In the scurry and bustle of the times, little thought was given to growing a second crop of trees. Most lumbermen considered reforestation to be highly impractical, and indeed, local tax policies encouraged lumbermen to "cut out and get out." But there were a few, encouraged by pioneering foresters such as Austin F. Carey, who braved the scorn of their fellows and made some provision for a second crop. In Alabama, the Alger Sullivan Lumber Company, T. R. Miller Mill Company, and Kaul Lumber Company were early converts to conservation. In 1905, at the request of the Kaul Lumber Company, the Forest Service prepared a management plan calling for modification of cutting practices and fire protection. It was approved by the nation's chief forester, Gifford Pinchot. Louisiana's Henry E. Hardtner, sometimes known as the "Father of Forestry in the South," cooperated with Herman H. Chapman of Yale University in studies to find ways to regenerate longleaf pine. At Bogalusa the Great Southern Lumber Company seeded longleaf pine on cutover land in the early 1920s. There were others, such as Posey Howell of the Dantzler Lumber Company in Mississippi, who gave some thought and effort to perpetuating longleaf pine, but by and large the longleaf forest was considered a nonrenewable resource to be mined like iron ore.

The railroad loggers swept across the longleaf belt from east to west. The intensity of the cut increased with the movement westward, reaching a crescendo in Louisiana. Few trees escaped the battering of the skidders. In the late 1920s it became apparent that the end was near. Only a few tracts of the 60 million-acre virgin forest remained. Many lumbermen closed down their mills and moved to the West Coast to log the virgin forests of Douglas-fir, ponderosa pine, and redwood. The finest hour of the longleaf pine had come to a close. Shocked silence replaced the din that had greeted the dawn of the twentieth century. Three decades of feverish activity had ground to a halt.

THE GREAT DEPRESSION

The Great Depression that plagued the nation in the thirties plumbed unusual depths in the land of the longleaf pine. Most of the big mills had cut out, and the operators had moved on. Banks and businesses dependent on them failed. Tax revenues for local governments dried up. Ghost towns, devoid of population, were tragic reminders of better days. The landscape had been drastically changed. The cool, green shadows of the virgin forest were only memories, and no longer did the resinous breezes sing through the tufted tree crowns. Instead, the refuse of logging lay bleaching in the sun on millions of acres. Except for stumps or occasional "mule tail" pines, the bare land was reminiscent of the western plains. Scrawny cattle picked at the coarse grass, and greedy razorbacks rooted out the remaining seedlings with gusto. Buzzards



FHS Collection

The Civilian Conservation Corps brought practical help to the depression-wracked South. Joining enrollees for a famous lunch at Big Meadows CCC Camp in Shenandoah National Park, Virginia, August 12, 1933, were (left to right) Major General Paul B. Malone; Louis M. Howe, secretary to the president; Interior Secretary Harold L. Ickes; CCC Director Robert Fechner; President Franklin D. Roosevelt; Agriculture Secretary Henry A. Wallace; and Assistant Secretary of Agriculture Rexford G. Tugwell.



U. S. Forest Service photo, FHS Collection

Reforestation was an important element of New Deal conservation work. Above: Longleaf pine seedbeds on the newly formed De Soto National Forest, Mississippi, 1937.

circled overhead and frequently feasted on the tick-infested carcasses of cows that had succumbed to the twin hazards of disease and starvation.

Suffering was most acute among the forest workers left behind after the mills cut out. Many squatted on tax-delinquent company lands, scratching out bare existences with small garden plots, submarginal farms, and scrawny livestock. Hard cash for medical care or other emergencies was nonexistent. Stunned and despondent, the people of the longleaf belt faced a grim future.

Into this dismal picture came a wilderness army of young men bringing renewed hope. The Civilian Conservation Corps, organized by President Franklin D. Roosevelt in 1933 for "conservation of our national and human resources," established many 200-man camps in the longleaf belt. Large tracts of cutover land were fenced against the destructive razorbacks, and millions of longleaf pine seedlings were planted. The young men built lookout towers and roads and waged a constant battle against the scourge of wildfire.

Much of the work was done on land purchased by the U. S. Forest Service from defunct lumber companies. New national forests were organized—the Croatan and Francis Marion in the Carolinas, three in Florida, two in Alabama, the De Soto in Mississippi, and two in Texas. The Kisatchie in Louisiana was greatly expanded. These forests would play a significant role in restoring longleaf pine on millions of acres.

Because of the rapidity with which the program was started, the CCC boys were first housed in tents. Later more permanent structures were erected. The U. S. Army was responsible for feeding, clothing, and caring for the men; state and national forestry agencies provided the work projects. Good food, clothing, and productive employment transformed undernourished, despondent youth into robust men with a new outlook on life. Many made careers of forestry and became key men in the forestry organizations.

The advent of the CCC had a salutary effect on the depressed economy of the longleaf belt. Many recruits came from local families without gainful employment. Each enrollee received \$30 per month, of which \$25 was sent home to his parents. Local men with forestry or logging experience served as straw bosses and foremen to supervise the green crews. These men were paid \$45 per month. Many World War I veterans who had been refused payment of their bonuses found employment in the CCC camps. Much of the payroll money, as well as funds for the purchase of supplies and equipment for the camps, found its way into the local economy. Cash registers began to ring again, and the outlook for the future became brighter.

But not everyone was happy with the CCC. The fire exclusion policy of the forestry agencies angered the cattlemen and sheepmen, who had been accustomed to burning the range annually to green up the grass for their livestock. Some old-timers were bitter at their former company employees and took out their resentment on the CCC boys. They set fires out of spite so the boys would have to work on Sundays and holidays. Sometimes the boys caught these old codgers in the act, and their supervisors had trouble keeping the crews from inflicting severe bodily harm to the firebugs.

A related problem involved trespass. Because of the lax policies of timberland owners, poverty-stricken squatters had been accustomed to cutting a few logs of merchantable size for crossties and other products from company lands without restriction. Such cutting was not tolerated on national forest lands, however, and the resulting prosecution of trespass cases created bitter enemies for the Forest Service.

The CCC movement was an important milestone in the longleaf pine story, but there was another depression-era development that was of equal, if not greater, importance. The battle between fire exclusionists and foresters who advocated use of fire for beneficial management purposes reached a showdown in the 1930s. The practice of prescribed burning, now generally used in many forest types throughout the United States, was first developed in the longleaf pine belt.

As early as 1850 Sir Charles Lyell noted that the hills near Tuscaloosa, Alabama, were covered with longleaf pine seedlings. He speculated that these resulted from Indian-set fires that kept the brush under control and favored the longleaf. In 1908 Herman H. Chapman, a Yale forestry professor and early advocate of controlled burning, wrote, "The most practical scheme for restocking longleaf pine appears to be to burn over the forest the fall preceeding the seed year, begin to burn as soon as the risk allows, due precaution taken to control the fire, and prevent damage to the young growth." Later, in 1926, his bulletin on regenerating longleaf pine recommended burn-



U. S. Forest Service photo, courtesy of the author

The role of fire in the longleaf pine belt was vigorously debated for several decades. In 1943 the Forest Service finally gave general approval for the practice of prescribed burning in the southern region. Above: A fire on the former Choctawhatchee National Forest, Florida, 1928.

ing for control of brownspot disease and hazard reduction, as well as for seedbed preparation. Others joined with Chapman in advocating the planned use of fire: Herbert L. Stoddard to improve the habitat for quail, Austin F. Cary and Inman F. Eldredge for hazard reduction, and many others.

The fire protection people, particularly the state foresters, bitterly opposed the practice. They felt that the promotion of controlled burning by foresters would undercut their fire prevention programs.

The practice was vehemently condemned by H. N. Wheeler, a Billy Sunday-type lecturer for fire prevention employed by the U. S. Forest Service. The tide began to swing in favor of prescribed burning, however, when research results in the 1930s supported the early proponents of the practice. Researchers with the Southern Forest Experiment Station confirmed that fire was a promising control measure for the brownspot dis-

ease, that seedbeds were greatly improved with fire, and that burning could be done without damage to the soil. S. W. Greene, an animal husbandman who conducted fire studies for the station at McNeil, Mississippi, proved that fire improved the range for cattle.

As a result of this mounting evidence, Region 8 of the Forest Service began a cautious program of prescribed burning. In 1935 Supervisor Arthur W. Hartman burned 900 acres on the Kisatchie; Supervisor L. L. Bishop put in two burns in Texas the same year; burns were also executed by Supervisor Raymond M. Conarro in Mississippi. Later, after a disastrous fire season, controlled burning for hazard reduction was started on national forests in Florida. All of these burns were pilot tests, and the practice was not approved for general use in the region by the Washington Office of the Forest Service until 1943.

In 1935 Herman H. Chapman, then president of the Society of American Foresters, arranged for the topic, "Forest Fire Control in the Coastal Plain Section of the South," to be discussed at the annual meeting. Among the speakers were S. W. Greene, Herbert L. Stoddard, Henry Hardtner, W. G. Wahlenberg, and "Cap" Eldredge. All of these men endorsed prescribed burning, and the session provided a great boost for the practice. Some state foresters became advocates of the planned use of fire and many others learned that it was a powerful management tool if carefully applied. The practice spread to other forest types throughout the nation from its beginning in the longleaf pine belt.

Acceptance of prescribed burning by foresters was a significant milestone in the longleaf pine story — one that argued well for the future of the species. Lack of fire, perhaps more than destructive fire, had prevented the establishment of longleaf pine on millions of acres. Fire exclusion had caused longleaf to be crowded out by brush or other pines not as resistant to fire as longleaf.

THE SECOND FOREST

Like the fabled phoenix bird, a second longleaf forest arose from the ashes of the virgin forest. It covered only a third of the original acreage and often was poorly stocked. Millions of acres remained in stump orchards with no hope for recovery until replanted in the CCC era. Some was direct-seeded in the 1950s after the discovery of a bird repellent. Much of the original acreage reverted to hardwoods and other pines, and, of course, much of the cutover went into agriculture and other uses.

Most of the second growth came back naturally, usually by accident but in some cases with an assist from man. Let's look at a few examples. "Red" Bateman, a practical woodsman with the Great Southern Lumber Company, helped secure

natural regeneration on several thousand acres around Bogalusa, Louisiana. Noting that a good stand of seedlings had been established under the virgin stands, he convinced top management to prohibit annual burning by turpentiners in order to protect this reproduction. When the virgin timber was clearcut, much of this reproduction survived and developed into well-stocked, second-growth stands.

The prescribed burning done by Supervisors Hartman and Bishop happened to come before a bumper seed crop in 1935. The excellent stands of second growth on the Red Dirt Pasture in Louisiana and in the Boykin Springs area in Texas owe their origin to these burns. Twelve years later a 50,000-acre seedbed burn before the bumper 1947 seed crop on the Conecuh National Forest in Alabama was likewise successful in establishing second-growth stands.

There is considerable evidence that many of the second-growth stands originated as "hurricane" timber. In 1906, for example, a disastrous hurricane felled much virgin timber in southern Alabama and Mississippi. Loggers moved in promptly and removed all downed as well as standing trees. Apparently there was advance reproduction under the older timber that sprang up to occupy the clearcuts. Undoubtedly some cattlemen's or turpentiners' fires accidentally prepared a seedbed for a bumper crop. If subsequent burning was delayed for a year or so and razorback hogs were absent, then some stands originated under these conditions.

These second-growth stands were far different from the virgin forests. Per-acre volumes were generally less; there were no large blocks of untouched stands ripe for the saw. Accordingly, logging technology in the South had changed. A significant development of the times was the advent of the automotive truck, and a new breed of loggers replaced the railroad loggers. Truck loggers moved into the scattered second-growth stands with "bob-tail" trucks to harvest the new crop. Mule teams replaced the steam skidders and loaders. Logs and poles were bunched and cross-hauled onto truck beds. Pulpwood sticks were loaded by hand. Felling and bucking was done with crosscut, bow, or wheel saws.

After World War II the truck loggers gradually developed improved technology. Man-day production was increased manyfold by the introduction of chain saws, and these are now being replaced by the even more efficient tree shears. Slow-moving mule teams have disappeared from the woods, replaced by rubber-tired skidders and knuckleboom loaders. The "bob-tail" truck is rarely seen now, as much material is removed tree length. Mechanical harvesters have taken most of the hand labor out of pulpwood harvesting.

Truck logging, as now developed, makes the culture and regeneration of the longleaf forest entirely practical. But during the last decade

ominous trends, not related to truck logging, have appeared that threaten the future of the longleaf forests.

A PLACE IN THE SUN

In the 1960s a modern-day army of men and machines moved into the second-growth longleaf forests with singleness of purpose. Their objective: to clearcut the longleaf and replace it with other pine species. There is no hope of recovery from these operations. Every merchantable tree is cut and removed. Unmerchantable trees and logging residue are pushed into windrows and burned or crushed into the ground with hugh machines, such as the LeTourneau Tree Crusher. The area is then disked and a new stand of trees planted. Hundreds of thousands of acres of longleaf pine, many well stocked, have been treated in this manner, and the type conversion continues unabated.

Why are foresters prescribing such a dismal fate for a tree much admired and with such great inherent value? There are a number of reasons; perhaps two are of greatest importance. First is the difficulty of reproduction, and second is the slow juvenile growth of the species. Seed-tree methods of natural regeneration often have resulted in failure. Squirrels and other predators have gobbled up seed treated with the best-known repellents, and planted stands have died in the first spring drought. Even when a satisfactory stand has been established, the seedlings often remain in the grass for years and eventually are killed by brownspot or brush competition.

Foresters, particularly those employed by pulp companies concerned mainly with cellulose production on a short rotation, are unwilling to gamble on longleaf pine. Many are not familiar with the latest silvicultural knowledge. Is there no hope for longleaf pine? Will this magnificent tree disappear from the South as an important forest type by the end of the twentieth century? At the moment the picture is not bright. More than half of the 20 million-acre second forest is gone, and more acres are disappearing under the saw and plow daily. But there is still hope. Let's look at some of the favorable factors.

Years of research and pilot testing have developed regeneration methods that will work if applied by competent silviculturists. In the last twenty years a natural-regeneration method, based on a carefully applied shelterwood system, has proven far superior to seed-tree methods. Considerable judgment is needed in deciding where the method will work and in the proper application of the techniques.

Direct seeding has proven successful if good, treated seed is sown under suitable site conditions at the proper time. Failures usually can be traced to lack of attention to these basics. For example, seeding must be delayed until late February or



U. S. Forest Service photo, courtesy of Philip C. Wakeley

If longleaf pine is to have its "place in the sun," modern silvicultural treatments must be applied by committed and competent people. Historical examples offer guidance, too. Above: Red Bateman's first commercial longleaf plantation in 1931 — nine years from seed — on land of the Great Southern Lumber Company near Bogalusa, Louisiana.

March under some soil conditions to prevent frost damage. Under other conditions November seeding is best. Sometimes a burned seedbed is adequate; elsewhere mechanical soil preparation and coverage of the seed is essential. Many of the failures of direct seeding can be traced to poor-quality seed with low germinative energy.

Much of the failure in plantations of nursery stock is due to the use of submarginal stock on inadequately prepared seedling beds. The seedlings, moreover, are easily damaged in transit by careless handling or by long periods of storage after they are dug. Researchers have found that specifications used for years to determine usable stock are not rigid enough. High survival and vigorous growth have been attained in the last decade where planters have carefully applied all the new knowledge.

Current research has achieved two additional breakthroughs that promise to brighten the hopes for longleaf pine. Geneticists have discovered strains of longleaf that are resistant to the deadly brownspot disease and make remarkable height growth. And the use of mycorrhiza in nursery beds may revolutionize survival and growth. Containerized planting systems might also have special application to bypass the extreme danger of damage to seedlings in transit from nursery to plantation, if practical methods can be developed

for using such systems. If the best-known planting methods are used, good juvenile growth acceptable to pulp companies can be obtained. Longleaf may actually outproduce other pine species on the real sandy soils on a short rotation.

Perhaps the brightest hope for the future of longleaf pine lies with the landowners committed to multiple use and the production of larger wood products on a longer rotation. The species is particularly adapted to those interested in quail management and the production of high-quality poles. The open, parklike forests have special aesthetic appeal, and many people are emotionally attached to longleaf because of its historical background and associations. Where there is high risk from wildfire, longleaf fits the bill to reduce the chances of loss. It is also more resistant to insects and to diseases like fusiform rust than are alternate pine species. Ownerships suitable to the management of longleaf range from the large national forests to small private landholdings.

There are two prerequisites if a place in the sun is to be found for longleaf pine. Foresters and landowners must recognize those situations in which longleaf is the best species to meet their objectives, and they must act favorably on this knowledge. Secondly, modern silvicultural treatments must be carefully applied by competent people.

Is this too much to ask to insure a future for a magnificent tree that has contributed so much in the past to the southern economy and has such a great potential for the future? Certainly not! Before it is too late, let's hope that the dangerous trend of the present will be reversed and that, as long as trees grow and winds blow, the gentle breezes will ripple the crowns of the longleaf pine to create the sweetest music south of the Mason-Dixon line. □

There is a wealth of literature on the subject of longleaf pine. Technical literature includes W. G. Wahlenberg, *Longleaf Pine: Its Use, Ecology, Regeneration, Protection, Growth and Management* (Washington, D.C.: Charles Lathrop Pack Forestry Foundation and U. S. Forest Service, 1946), and Thomas C. Croker, Jr., and William D. Boyer, *Regenerating Longleaf Pine Naturally*, U. S. Forest Service, Research Paper SO-105 (New Orleans: Southern Forest Experiment Station, 1975). Contemporary sources on the prescribed-burning controversy include Herman H. Chapman, *Factors Determining Natural Reproduction of Longleaf Pine on Cut-over Lands in LaSalle Parish, Louisiana*, Yale University Bulletin 16 (New Haven, 1926), and papers given at the 1935 annual meeting of the Society of American Foresters, printed in the *Journal of Forestry* 33 (March 1935): 320-60. An example of a useful travel account is Frances Harper, ed., *The Travels of William Bartram* (New Haven: Yale University Press, 1958). There are many historical studies of lumbering in the South; one of the best is Nollie W. Hickman, *Mississippi Harvest: Lumbering in the Longleaf Pine Belt, 1840-1915* (University: University of Mississippi, 1962).