South Carolina
Forest Science

Guide for Teachers
a special project of the
S.C. Forestry Commission
FOREWORD

The South Carolina Forest Science series is designed to provide middle school science teachers with supplementary or alternative lesson material dealing with forestry and related environmental subjects.

The Forestry Commission gratefully acknowledges the contributions of: Commissioner Charles Williams, for conceiving the idea and his leadership throughout the project; Principal Dr. Celestine Pringle, Science Department Chairperson Carolyn Greene, and the teaching staff of J. B. Beck Middle School for the pilot implementation; and Staff Forester Ken Cabe for writing and illustrating the lesson material.

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INTRODUCTION

This teacher's guide to sixth grade Forest Science is designed to help you teach a basic overview of South Carolina forestry. The book includes seven lessons which include historical and sociological perspectives as well as scientific information.

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Each lesson includes factual information as well as italicized teaching suggestions, projects, and extensions. The margin of each page contains some helpful references and lots of room for notes you may wish to keep.

One teacher's resource kit is provided to the school. Material in this kit may be copied or used as reference as you teach the unit.

This book produced by the SC Forestry Commission. Editorial comments and suggestions are welcomed. Correspondence should be addressed to:

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LESSON 1: THE WAITING LAND

When Columbus returned from his historic voyage, he reported a wonderful wilderness of trees "of a thousand kind and tall." From the tip of Florida to the rocky coasts of Maine, this proved to be an accurate description. South Carolina was no exception.

I. The Forest

Along the coast the forest was a tangle of palmetto, live oak, pine, various hardwoods, cedar, and brush crowded against the edge of the dunes. Blackwater rivers and creeks created great swamps stocked with huge cypress and gum trees. On higher land, hundred-foot tall pines grew shoulder to shoulder in almost pure stands, or shared space with oaks, gums, and hickories.

In the midlands and piedmont there were fewer swamps, but stream floodplains were populated with a wide variety of hardwood trees. Much pine, oak, hickory, and sweetgum grew on the uplands.

Less pine and more hardwood were found in upper elevations of the piedmont and mountains. There were large areas of American chestnut (now practically extinct), as well as lots of oak and hickory.

Patches of cleared land were scattered throughout South Carolina, especially in piedmont and mountain floodplains. Many of these were agricultural fields prepared by the Indians; others were the result of natural wildfires that burned unchecked across the countryside.

II. Inhabitants of the Forest

Wildlife was plentiful, but probably not as abundant as most people think. Deer, turkey, black bear, and panther were among the big game animals; some early records indicate elk and a species of bison as well. Small animals included most of the familiar forest animals of today—rabbits, squirrels, opossums, beaver, quail, etc., as well as the now extinct Carolina parakeet and ivory-billed woodpecker. Some animals, strangely enough, are probably more prevalent today than they were 500 years ago. These include deer, quail, and rabbit.

Native Americans (Indians) had occupied what is now South Carolina for thousands of years before the coming of the white man. As is the case with most primitive people, their lifestyle was remarkably adapted to the natural environment. The
Indians lived in the forest, obtained much of their food from it, and used its products to improve their lifestyle. They made medicine and dyes from certain tree bark and small plants, some of their tools and weapons had wooden shafts and handles, their canoes were made from hollowed-out tree trunks, and many lived in houses made from logs. Some bands survived almost completely by hunting and gathering, but most supplemented the forest's bounty through agriculture.

It was through agriculture that the Indians made their greatest impact on the natural environment. They cleared land by slash and burn techniques, deadening trees by chopping away the bark, then setting the area on fire. These fires doubtless burned large acreages of forest since the Indians had no way (or desire) to extinguish them once their original purpose was served. In these clearings, the Indians planted their crops of corn, squash, and gourds. When fields lost their natural fertility, the Indians simply abandoned them and applied the slash and burn process to another area. Abandoned fields and the clearings created by these wildfires eventually reverted to forest, creating extensive stands of pine.

Ask the children where slash and burn agriculture is presently in the news. Discuss the similarities and differences between what the Indians did and what is now going on in the rain forests.

For more information on Indian lifestyles, you may wish to consult the references listed at right.

Reference and Notes

See also:

Sun Circles and Human Hands, Emma L. Fundaburk, 1957.


The World of the American Indian, National Geographic Society, 1974.


See also several books by Dr. Bert Bierer, Univ. of SC Press.
LESSON 2: THE FIRST EUROPEANS

Prepare the class by discussing life in Europe in the early 1500’s: crowded cities, poor sanitation, disease; farmers who worked hard with little chance of ever owning their own land; a class system that recognized heredity rather than ability, etc.

Lead the class to the realization that comfortable people don’t generally go charging off into the unknown.

Talk about the emigrants, how they probably felt about leaving . . . optimistic, sad about leaving friends, probably a little scared. Discuss the hardships of the voyage: weeks at sea, poor food, crowded conditions, illness, etc. Help the class feel the excitement of the first sighting of land . . . crowding the ship’s rail, straining eyes to the west, watching the dark line on the horizon slowly develop into an unbroken wall of forest.

To the first settlers, the forest was a threatening, alien environment. Steeped in the folklore of Europe, the colonists saw the forest as the lair of trolls, witches, ogres, werewolves, and demons.
In reality, it harbored dangerous animals and Indians, and it was especially frightening to a people accustomed to towns and farm life. The forest was an obstacle to their familiar lifestyle; it was simply in the way. As do most "civilized" people, the Europeans set about modifying the environment to suit their needs and desires.

Trees were cut to build houses, land was cleared to grow crops, towns began to develop, roads were built to connect farms and towns. More and more people arrived from Europe, and settlements began appearing farther and farther inland. Despite all this, the forest seemed to go on forever.

Gradually, the settlers learned to use the forest. They learned to hunt and fish; from the Indians they learned which plants were good to eat and which were medicinal. Their iron tools enabled them to cut and shape trees into things they needed. Trees, in and of themselves, had little value since they were abundant and available to almost everyone.

Supplement this lesson by conducting Project Learning Tree Activity 21 in the manual for grades 7-12. Change the starting place to Georgetown or Charleston, the date to sometime in the 1700's, and the destination to someplace in the midlands or piedmont of S.C.

If you are unfamiliar with Project Learning Tree, call the PLT coordinator at 737-8800. Free workshops are available!
LESSON 3: EARLY FOREST PRODUCTS

The early colonies in Massachusetts, Pennsylvania, and Virginia quickly recognized that certain products made from trees were valuable commodities for both local use and for export. Lumber, tall pines for ship masts, and various products made from pine sap (called “naval stores”) became important even during the 1600’s in those colonies. English monarchs placed great value on these products and closely regulated exports. Some products could only be exported to England, and some were considered exclusive property of the King.

Pines suitable for ship masts were especially prized. According to the charter for Massachusetts Bay Colony in 1691, any pine measuring 24" in diameter at the stump was the property of the Royal Navy. Cutting such a tree was a violation of the law and punishable by a heavy fine. Similar provisions were enacted in other areas. Legend has it that the town of Kingstree, S.C., was so named because one of the King’s trees was located in the area.

Have the class write to the Williamsburg County Public Library for more information. They have an extensive file on the subject. One inquiry per class, please.

Although there were settlements in South Carolina in the 1600’s, the value of the forest was not exploited very much until the eighteenth century. It was during this time (1700’s) that the coastal pinelands achieved importance as a source of naval stores. Southern longleaf and slash pine were such excellent producers of tar, pitch, and turpentine that the naval stores industry in the northern colonies soon collapsed. Note: these products derived their name from extensive use on ships. Tar and pitch were used to treat rope against decay and as caulking and waterproofing for wooden ships. English sailors were sometimes called “tars.”

If you live in the midlands or coastal plain, there may be local people who worked in the naval stores industry. Locate one or more of these (they are probably in their 70’s or 80’s) and invite them to talk to the class. Record living history interviews as you find people who worked in the turpentine woods. Begin developing a collection of turpentine tools for display in the school. Make this a priority project... in a few years it will no longer be possible.
Agriculture was the primary activity in South Carolina and many coastal planters owned thousands of acres of land. When the fertility of a field was exhausted, a new field was cleared; old fields were abandoned and allowed to revert to forest again. Since pine is usually the first tree species to re-seed on bare soil, this practice helped perpetuate the pinelands in the coastal plain.

Compare this to the Indian farming described in Lesson 1.

By the mid-1700's, much of the land along the coast was controlled by large planters, forcing new arrivals in the South Carolina colony to move farther inland. Once again, the forest was an obstacle to be cleared.

Independence from England removed many of the restrictions on timber export. Logging and lumber manufacture developed into a booming business. By the late 1800's, lumbering was consistently among the top five industries in the country. During this period, the forest was heavily exploited for its products. No one was very concerned by this; there had always been plenty of wood.

In the early 1900's, however, the inevitable happened: good timber was becoming hard to find in South Carolina. Many of the large sawmills closed down or reduced their operations due to a lack of readily available raw material. The virgin forest that had once seemed inexhaustible was gone.

Conduct Project Learning Tree Activity 21 in the manual for grades K-6. Write the italicized situation on the board, then ask the children to make an individual decision and write it down in their notebook. As a group, discuss the various decisions. Ask how the decisions will affect: the family during the following summer and the next winter; wildlife, including birds; the neighbors; and whoever lives in that place 20 years from now.
LESSON 4: NEW ATTITUDES TOWARD THE FOREST

Early logging and lumbering companies in S.C. either did not know or did not care that the timber resource was being depleted. They simply cut timber wherever they could find it and moved on. This practice was referred to as “cut out and get out.” By the early 1900’s, most of the big timber was gone, and lumber and naval stores were not as profitable as before. The pulp and paper industry was still in its infancy, so the remaining wood products operators had to adjust to using smaller trees or go deep into the swamps for the few large trees that were left.

Major James Lide Coker of Hartsville was the first person to learn how to make paper from southern pines. He and his son formed the South Carolina Fiber Company in 1884 to produce coarse paper for wrapping and industrial use. (This kind of paper is called “kraft” paper.)

Ask the children what else the Coker family of Hartsville is noted for. If any of the children are from farm backgrounds they may know about Coker’s agricultural seed; perhaps some of them have parents or relatives who attended Coker College.

The industry was still alive, but a few people began to worry that trees were being used faster than new ones could grow. Vast areas of South Carolina were simply growing up in brush, and much of the woodland burned every year in wildfires. Soil was eroding from hillsides because there were no trees to hold the soil in place. Something had to be done.

In 1922, a member of the S.C. House of Representatives asked that the legislature invite Gifford Pinchot, a noted northern forester, to speak to the Assembly about forest conservation. Although Pinchot was the most knowledgeable expert in the U.S., the legislature refused because he was a Republican.

You may wish to have several students research Gifford Pinchot and report to the class. Note: Pinchot was the Father of American Forestry and laid the groundwork for the first Forestry School in the US.

Despite this setback, those who were concerned about conservation kept on trying. Among these were members of womens’ clubs who were eager to use the influence of their recently won right to vote. Also among the supporters of forestry
were a few leading lumbermen who recognized that their futures depended on a continuous supply of timber.

Their efforts were gradually rewarded. In 1924, the legislature invited Mr. William Greeley, Chief of the United States Bureau of Forestry, to speak. In his remarks, Mr. Greeley stated: "The end of the great pineries of the South is near . . . but there is no need to regret having utilized our forests as we have. Any vigorous and energetic race would have done the same. But we need to begin reforestation." The legislature gave him a standing ovation, but took no action.

Conservationists wouldn't quit; they soon enlisted the aid of the powerful state Kiwanis Club. This organization took an active role and spearheaded a drive that led the legislature to establish the S.C. State Commission of Forestry in 1927.

This is an excellent example of two aspects of human nature: most people are reluctant to change, and most people are distrustful of those who are in some way "different". It is also an example of how, in a democracy, ordinary people can change things.

Ask the children for more recent examples of these phenomena. The American Civil Rights movement may come to mind.

In 1928, the first State Forester was hired to oversee the protection and development of the state's forest resources. During the first year, the Forestry Commission opened a tree nursery to produce seedlings for reforestation, and began the task of educating landowners about tree planting and fire protection. The following year, the Forestry Commission prosecuted its first case for illegal woods burning and, by 1930, had established forest fire protection on more than half a million acres of land.

Other organizations became interested. In 1930, West Virginia Pulp and Paper Company (now Westvaco) built the state's first fire tower dedicated to watching for fires on private land. Citizens in Kershaw County organized to "prevent fires . . . encourage reforestation . . . (and) spread abroad the knowlege of the value of trees."

Since the turn of the century, forestry has come into its own in South Carolina. The Forestry Commission offers statewide forest fire protection, and forest industry and rural fire departments provide valuable firefighting services. Three and one-half billion tree seedlings have been planted since 1929, and over 475 companies are now involved in processing wood into useful products.
Start a class collection of the logos of organizations involved in forestry in the county. Paper companies, logging companies, pulpwood dealerships, park and outdoor recreation organizations, rural fire departments, consulting foresters, wildlife agencies, etc. Display these in the classroom as a reminder of how important forestry is to the county.

Brochures outlining the services of the SC Forestry Commission are available from your local office.

The end of this lesson is a good place to show the Forestry Commission’s videotape, Then, Now, and Beyond. The tape outlines a brief history of forestry in South Carolina and discusses the mission and activities of the agency. You can get the tape (and maybe even a guest speaker) by contacting the nearest Forestry Commission office.
LESSON 5: SOUTH CAROLINA FORESTS TODAY

The purpose of this lesson is to give students baseline information on the forest situation in S.C. today. This is the forest their generation will inherit.

Over the last 500 years, about one-third of South Carolina's forests have disappeared. Between 1978 and 1988 alone, forest land decreased by about 645,000 acres. This is about the same acreage as all the forests in Georgetown and Clarendon Counties combined.

Get the children's reaction to this fact: good or bad? Then ask the children to discuss what happened to this forest (agriculture, roads, cities, lakes, home sites, shopping centers, landfills, etc.). Once again, discuss good or bad. Lead the students to understand that increasing population and more sophisticated lifestyles take a toll on the resource base.

Talk about what can be done to maintain a comfortable lifestyle while conserving the forest. Have the class contact the County Administrator's Office to see if your county has a Tree Ordinance. Discuss how such laws affect the forest and how they affect the owners of trees and forest land. Note: In 1992, Georgetown, Charleston and Beaufort were the only counties in S.C. having county-wide tree protection ordinances.

At present, S.C. has about 12.2 million acres of forest land, 7 million acres used for other purposes, and about .6 million acres of land covered by water.

Ask the children who they think owns most of the forest land. They will probably mention government or forest industry as the primary owners.

Of the forest land, private individuals (regular citizens) own 68%; forest industry owns 22%; and government (federal and state) owns 10%.

You may wish to have the children to make pie charts of the total land base and ownership patterns to display in the classroom. This information will be important to understanding questions posed in later lessons.
Loblolly pine (Pinus taeda) is the most common tree species in the state. It grows naturally in every county and is the species most frequently planted when reforestation is done. There are a number of other pine species which occur naturally in S.C.; pines of one type or another account for over 5 million acres of our total forest. Various hardwood species (broad-leafed trees) make up the rest.

You may wish to show the class some examples of various species and discuss their uses briefly.

Trees are the most valuable cash crop in the state; the annual harvest is worth about $527 million. Forestry, including logging and manufacturing, provides jobs for 38,000 people. By comparison, that’s more people than live in all of Williamsburg County, and almost as many as live in Georgetown County. Forestry is the third largest manufacturing industry in the state, behind textiles and chemicals.

You may wish to have the children list forest products that are produced in your county.

Wood products are grown, harvested and manufactured in all 46 South Carolina counties.

Put forestry on a personal basis by asking the children if any of their family members work in some phase of forestry. This should include loggers, mill workers (including clerical), foresters, woods workers, truck drivers, etc. Then ask if anyone has family members working in equipment sales and repair, or at service stations selling fuel to loggers, or as carpenters working with wood, etc. By using various extensions, you will probably be able to show a significant number of families depending at least partially on the industry.
LESSON 6: TREE PHYSIOLOGY

This lesson explores basic internal and external physiology of trees.

Trees are characterized as woody perennial plants, generally having an upright form and a well-defined trunk; some experts suggest that plants must be capable of growing to a mature height of 20' to be classified as trees. Hundreds of different species have been identified and classified in the Southeastern United States, but most have a few characteristics in common.

Show the video "Tree Detective" (18 minutes). You may wish to preview the tape in order to reinforce the important teaching points. Diagrams entitled "Basic Parts of a Tree" and "Let's Look Inside A Tree" are included in the teacher's kit. Copy these for the children or have some of the students make large posters of them to display in the classroom.
Ask a student whose father is a logger to bring in a 10-12" diameter cross-section of a pine trunk. Try to obtain a similar cross-section of sable palmetto. (Sometimes landscape companies can provide these if they are replacing dead palmettos.) Ask the students to compare the two cross-sections, looking for similarities and differences. Is the South Carolina State Tree really a tree? (No. It is a member of the grass family whose trunk is very similar to a corn stalk!) Note: caution the students as they handle the palmetto. The fibers in the trunk are very sharp.

You may wish to extend this lesson into a class on social studies or history using Project Learning Tree Activity 37 in the manual for grades K-6. The High School shop class may be able to prepare the “tree cookies” for you. Dead branches of red cedar work well, but almost any dead branch about 2” in diameter will do.
LESSON 7: ENEMIES OF THE FOREST

South Carolina's forests have many enemies. This discussion will explore some of the most significant: fire, insects, and disease. Some information in this lesson is specific to South Carolina and may not apply in other areas.

Ask the children what they think is the most significant enemy of the forest. Most of them will probably say "fire".

Contrary to what most people think, the most dangerous enemy of the forest is not fire but insects and diseases. Insects and disease may be generally grouped together because they are natural biological enemies of trees, but they should be examined separately.

I. Insects

No one knows how many different species of insects there are, but estimates run from 600,000 up to several millions. This is more than all plant and other animal species combined. About 80,000 species have been identified in North America.

Most people refer to any creepy-crawly animal as an insect or just a "bug". Scientific classification, however, is based on the configuration of the adult body form. Most adult insects have three pairs of legs, three body parts (head, thorax, and abdomen), and an exoskeleton. Most insects have wings: some, like butterflies and roaches, have soft wings; others, especially beetles, have hard wings.

[Diagram of an insect showing head, thorax, wings (2 pr), abdomen, legs (3 pr)]

All insects originate from eggs and develop by identifiable stages into the eventual adult form. This system of change is called metamorphosis.

When this system of change requires four steps, it is called complete metamorphosis. The stages are egg, larva (caterpil-
A three-step maturation process is typical of grasshoppers and roaches. The insect egg hatches into a nymph which usually resembles a mature adult. The nymph undergoes a number of subtle changes until it possesses all its adult characteristics. There is no pupal stage in incomplete metamorphosis.

Many insects damage trees by feeding on various parts of the tree. Others cause tree problems by excavating nesting cavities to raise their young. Some also carry diseases that are transmitted to the tree as the insects feed or burrow nesting cavities.

In South Carolina, most insect damage is caused by feeding larvae. Different species feed on different parts of the tree; some eat leaves, others eat buds, fruit, or seeds, and some eat the soft cambium tissue just inside the bark of the tree. The most damaging insect is the Southern Pine Beetle whose larvae feed voraciously on the cambium of pines and destroy 2.6 million dollars worth of timber each year.

Control of forest insect pests is frequently very difficult, especially when populations of a certain insect increase to epidemic proportions. Chemical controls may be used in some situations, but such measures are expensive and must be applied carefully to avoid environmental problems. Biological controls are sometimes used to disrupt the target insect's life cycle. This usually involves releasing sterile male insects to breed with females in the wild, resulting in a lower reproductive rate.

In South Carolina, epidemics of Southern Pine Beetles crop up frequently. Control of this insect is best accomplished by
conducting a concerted effort to remove the infested trees from the forest. If infested trees are cut before they have a chance to dry out and begin to decay, they can still be used for lumber or papermaking. In remote areas where logging is not practical, fairly good control can be achieved by simply cutting the infested trees and letting them dry out on the ground.

Since healthy, vigorous forests are less susceptible to insect attack, good management can reduce the chances of severe insect damage. In pine forests, this may include periodic thinning to insure that all trees have good access to the sunlight and nutrients needed for rapid growth. Old trees are less vigorous, so they are likely targets for insect attack. Sometimes this is an important consideration in determining when a forest should be completely harvested and regenerated.

II. Diseases

The most important enemy of South Carolina forests is tree disease. Diseases are caused by two general groups of agents: biotic (living) agents called pathogens, and abiotic (non-living) agents. The biotic agents may be fungi, bacteria, viruses, etc. Abiotic agents are called non-pathogenic and include climatic, environmental, and pollution-related diseases.

Of all types of tree diseases, fungi are the most damaging to our forests. Fungi are simple plants which are incapable of making their own food and must take it from a host organism. There are fungi which attack almost every part of a tree, including leaves, buds, stems, roots, and the inner circulatory system.

The single most destructive disease of pines in South Carolina is fusiform rust. This fungus attacks most of the southern pines and loblolly pine is extremely susceptible. (This is especially significant since loblolly is the most important forest tree in South Carolina.)

Fusiform rust creates swellings or galls on pine stems and branches. These galls grow as the infection spreads, killing branches and weakening stems. In the early spring, yellowish blisters appear on the galls; the blisters break open to release masses of bright orange dust-like spores. As these spores are blown by the wind, they land on and infect young, succulent oak leaves. Certain changes occur on the oak leaves and new spores are produced. These new spores are carried by the wind to re-infest pines, starting the cycle again.

Other fungi cause other diseases. Some produce long strands of vegetative material which clog the water-conducting tissue within trees, some cause rot in the root system, and others
enter trees through wounds and create rot within the stems and branches.

Treating forest trees for disease is usually neither practical nor successful. Since many disease organisms can enter the tree through breaks in the bark, protecting the trees from damage can provide a degree of prevention. For diseases that are present in the soil, a measure of prevention can be achieved by planting species that are not susceptible to that particular disease. One of the most promising disease prevention methods is producing disease-resistant tree varieties through selective breeding.

III. Fire

Wildfire is universally recognized as an enemy of the forest. While not as economically important as either diseases or insects, wildfire constitutes a double threat. More and more frequently, as populations increase and people settle in rural areas, wildfire constitutes a threat to both the forest resource and the lives and property of the citizens.

Each year Forestry Commission firefighters respond to an average of 6,000 wildfires which burn a total of about 30,000 acres. Of these, 98% are caused either directly or indirectly by the activities of people. Lightning, an important fire cause in the western United States, accounts for only 2% of South Carolina’s wildfires. (Since South Carolina does not have a uniform fire reporting system, these figures do not include the wildfires controlled by rural fire departments. The actual number of wildfires may be twice the figure reported here.)

Wildfire damages the forest environment in several ways: it can kill trees outright, especially young trees; it may damage portions of the bark and kill the underlying cambium tissue, making the tree susceptible to insect or disease attack; by destroying needles and leaves, wildfire retards tree growth and vigor; and fire can damage the soil directly or make it more susceptible to erosion. Very little wildlife is actually killed by fire, but some habitat may be temporarily destroyed. The actual impact on wildlife depends on the availability of acceptable habitat nearby, and whether the fire interrupts the animals’ reproductive cycle.

To understand how firefighters combat forest fire, it is important to understand the elements of fire itself. Fire is actually rapid oxidation of fuel, stimulated by heat. Three components are required for this process to occur: fuel, oxygen (air), and a heat source.

Fuel is anything that will burn in the forest, including dead grass, leaves, pine straw, brush and even the trees themselves.
There is always plenty of oxygen from the air, so all that is needed to create a fire is a heat source . . . a match, a cigarette, a smoldering campfire. The three components of fire are frequently diagrammed as the fire triangle:

Forest firefighters usually attack the fuel side of the fire triangle, using tractors with plows and blades to remove fuel from the path of the fire. Firefighters with rural fire departments may take another approach by spraying water or foam on the fire to remove the heat. Sometimes firefighters take away a fire's oxygen by throwing dirt on it or smothering it with long-handed fire swatters.

*Invite a forest firefighter to demonstrate his equipment, discuss the procedures for reporting wildfires, and explain how fire protection works in your county.*

As with most problems, preventing wildfires is safer, better, and more economical than having to put them out. The fire cause chart shows how wildfires start in South Carolina, and should suggest ideas for forest fire prevention.

### Causes of Wildland Fires, 1987-91

*(Average No. per Year)*

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<th>Cause</th>
<th>No. of Fires</th>
<th>% of Tot. Fires</th>
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<tr>
<td>Lightning</td>
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<tr>
<td>Campfire</td>
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<td>.4</td>
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<tr>
<td>Smoking</td>
<td>293</td>
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<tr>
<td>Debris Burning</td>
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<td><strong>Totals</strong></td>
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*Ask students to study the fire cause chart and develop a fire prevention campaign plan for one of the major causes.*
RESOURCES

SC FORESTRY COMMISSION
LOCAL, DISTRICT, OR COLUMBIA HEADQUARTERS

CLEMSON EXTENSION SERVICE
LOCAL COUNTY AGENT'S OFFICE

SC WILDLIFE AND MARINE RESOURCES DEPT.
LOCAL OR COLUMBIA HEADQUARTERS

FOREST INDUSTRY IN YOUR AREA

DEPT. OF PARKS, RECREATION, AND TOURISM
LOCAL STATE PARK OR COLUMBIA HEADQUARTERS

IN THE TEACHER'S KIT ...

PUBLICATIONS
FAMILIAR TREES OF SOUTH CAROLINA

VIDEOTAPE
"TREE DETECTIVE"

ILLUSTRATIONS
PARTS OF A TREE
LOOK INSIDE A TREE