

ARTHUR STUPKA



FOREST TREES  
*and*  
FOREST REGIONS  
*of the*  
UNITED STATES

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**FOREST TREES AND FOREST REGIONS OF  
THE UNITED STATES**

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**INTRODUCTION**

Trees serve us in so many different ways that we are naturally interested in knowing more about the trees of our country and the tree communities, or forests, in which we live or which we visit. More people than ever before are now getting out of doors and visiting unfamiliar sections of the country. Increasing numbers are going into the forests in search of adventure, recreation, and health. The automobile, Scout, and 4-H Club movements, and the shorter hours for labor all encourage wider travel.

Many States have published popular manuals giving the names and brief descriptions of their more important or common forest trees. In the preparation of many of these the Forest Service has been a cooperator.<sup>1</sup> The purpose of this publication is to present in simple form the names of all the tree species of continental United States with their geographic ranges and a few distinguishing characteristics of each, and to give brief descriptions of the various natural forest regions, together with the names of the principal trees which

<sup>1</sup> See list of names and addresses on pp. 52 and 53.

make up each region in the United States, Alaska, Puerto Rico, and Hawaii.

This publication is intended to help people get better acquainted with trees and forests. It should lead to a broader appreciation of the value and importance of trees and result in greater care of our forests and their better protection against fire. This in turn should mean a larger measure of out-of-door pleasure and profitable recreation.

### NATURAL GROUPS OF FOREST TREES

The cone-bearing trees, such as the pines, spruces, firs, cedars, and cypresses, are commonly grouped together and known as conifers or from a lumber standpoint as softwoods. The other group is known as hardwoods and consists of the broadleaf trees, such as the oaks, elms, ashes, maples, and hickories. These two groups are now widely recognized, and they are generally true to name. In each group, however, the woods differ widely in hardness as well as weight and strength, and some exceptions occur. For example, the longleaf pine among the conifers or softwoods has wood that is harder than that of willow and magnolia which belong to the hardwood group. In the group of hardwood trees occur two subgroups or families, namely the palms and yuccas, whose wood and seed structure are very different from all the others. Still another strange family among the hardwoods is the cactus. Further reference to all of these natural groups from a botanical standpoint will be found under the next heading.

Another natural grouping separates the evergreen trees from the deciduous trees, or those that drop their leaves in the fall. Most of the conifers, such as the pines, junipers, firs, and spruces, are evergreen in habit, that is, they hold their leaves over winter. The larches and southern cypress, however, drop their leaves in the fall and are thus deciduous, like most of the northern hardwoods. The holly, a southern hardwood which extends into the North, is evergreen. In the southern portion of the United States many hardwood trees are evergreen and shed their leaves only after the first, second, or third years. Among these are live and laurel oaks, red bay, evergreen magnolia, laurel cherry, and many small trees of the subtropical and tropical portions of Florida and Texas and parts of New Mexico, Arizona, and California.

### NATIVE TREES IN GREAT VARIETY

The forests of the United States are composed of a large number of different kinds or species of trees, many of which are of high usefulness and value. Probably no other land of equal area lying within the Temperate Zones has so many different tree species with so great a variety of woods as this country.

The botanical classification of trees is at the best somewhat complicated. An attempt is here made to show in a simple way the botanical grouping of our native forest trees.<sup>2</sup>

The forests of continental United States are composed of a total of 810 different kinds or species of native trees,<sup>3</sup> grouped under 199

<sup>2</sup> Only native trees will be considered in this publication. This excludes all foreign or exotic trees, many of which are commonly present and often included in popular descriptions.

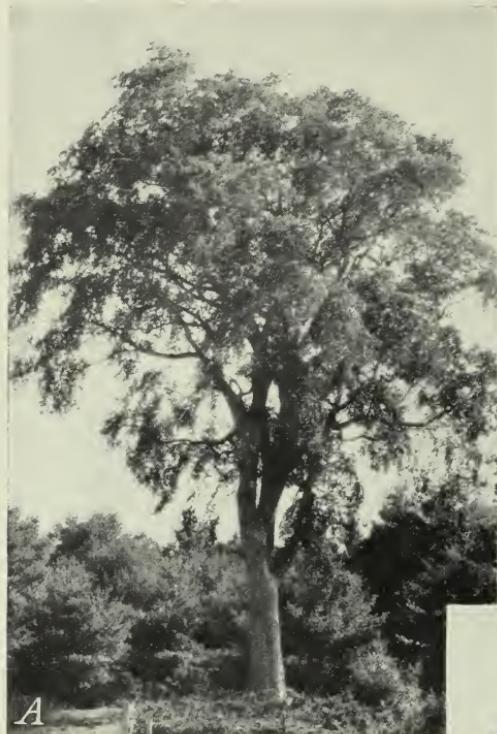
<sup>3</sup> There are many recognized varieties and hybrids, but they are not generally included in this publication. Only a few varieties of unusual importance are mentioned, together with a few that are the sole representatives of the species.



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A WESTERN FOREST.

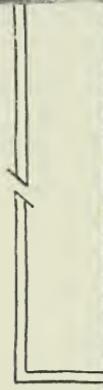
The forests of the Rocky Mountain and Pacific Coast forest regions consist largely of pines, spruces, and firs, with varying amounts of cedars, junipers, hemlocks, larches, and redwoods. Many of the western forests extend to high altitudes. View in Lolo National Forest, Mont.



A



B



C



D

F-236136, F-209391, F-298993, F-29659

## SOME FAVORITE EASTERN HARDWOOD TREES.

*A*, American elm, a tree of graceful beauty and stately proportions. *B*, Red gum, or sweet gum, of the South grows to large size and yields mottled reddish wood extensively used for many purposes. *C*, Black walnut, the country's premier tree for high-grade cabinet wood and valuable nut crops. *D*, White oak, a hardy, long-lived tree yielding very useful timber.

genera that make up 69 families, which in turn belong to 2 broad classes of plants. Two of the families of trees, namely, those which include the conifers (pines, spruces, firs, and others) and the yews, belong to one of these classes known as gymnosperms,<sup>4</sup> and the other 7 families, consisting of the palms, yuccas, and hardwoods, belong to the other class known as angiosperms.<sup>5</sup>

The northern white, shortleaf, longleaf, and western white pines are examples of species of the genus *Pinus* of the family Pinaceae and of the class Gymnospermae. Popularly they belong to the conifers or softwoods. The white, northern red, scarlet, and black oaks, for example, are species of the genus *Quercus* of the family Fagaceae and of the class Angiospermae. Popularly they belong to the broadleaf or hardwood group.

In our forests are found 13 different groups or genera of true conifers, 2 of yews and tunions, 7 of palms, 1 of yucca, and 176 of hardwoods, or a total of 199 genera. The conifers include 35 kinds or species of pines, 7 spruces, 10 firs, 4 hemlocks, 3 larches, 12 junipers, and 19 others, mostly cedars and cypresses, or a total of 90 species. There are 4 species of yews and tunions, and 21 species of palms and yuccas. The hardwoods or broadleaf trees as a group are composed of 61 native species of oaks, 18 hickories, 19 ashes, 14 cherries, 11 plums, 10 apples, 17 maples and boxelders, 7 birches, 6 elms, 15 cottonwoods or poplars, 22 willows, 178 hawthorns, 5 gums, 6 hackberries, 9 magnolias, and 297 species of other genera to which, for example, belong beech, persimmon, dogwood, mulberries, locusts, holly, and walnuts, and many others, making a total of 695 species of hardwoods. Altogether, the above makes a grand total of 810 species of native trees in the United States.

Many kinds of trees attain heights of 100 feet, and a few heights of 300 to 350 feet. Many are small in size. Under varying conditions of climate and soil, some occur both as trees and shrubs. If a woody-stemmed plant has one well-defined trunk and grows to be at least 2 inches in diameter and 8 feet in height, it is classed as a tree species.

The natural home or range of trees varies greatly. Some are found widely over a vast area, such as beech, American elm, black willow, white and black oaks, shortleaf pine, and eastern red cedar. A few, including white spruce, dwarf juniper, aspen, balsam poplar, paper birch, peachleaf and (Bebbs) willows, coralbean and buttonbush, range practically across the continent in the United States, while a few others, like the black spruce and tamarack, extend across the continent, partly in the United States and partly in Canada. The wild plum, honey mesquite, hoptree, boxelder, leucaena, and nannyberry occur in both the eastern and western divisions of forest regions. The Torrey pine is confined to an area of about 40 acres in the extreme southern part of California. Southward, the number of native tree species increases. From a maximum of 60 to 80 species occurring in any one northern State along the Canadian border, the number increases to some 200 in the Middle Atlantic region (for example in North Carolina), and in Florida reaches a maximum of about 350, of which more than 100 are tropical and occur exclusively in that State.

<sup>4</sup> Gymnosperms are plants whose seeds are borne openly on a naked scale or bract.

<sup>5</sup> Angiosperms are plants with seeds enclosed in an ovary and bearing the more common kinds of flowers. There are two divisions. The yuccas and palms as a group are known as monocotyledons (having one cotyledon in the seed embryo, parallel-veined leaves, and other characteristics), and the broadleaf or hardwood trees as dicotyledons (with two cotyledons in the seed embryo, netted veins, and annual rings of growth in the stem or trunk).

Information concerning the native trees of the eastern and western divisions of the United States will be found respectively on pages 5 and 24. A view in the western forest division is shown in plate 1, and in plate 2 are shown some important eastern forest trees.

### DESCRIPTIVE LIST OF NATIVE FOREST TREES

A summary of the names of all the native tree species of continental United States with brief notes on their ranges and characteristics follows.<sup>6</sup> It constitutes one of the major features of this publication. The trees are listed under two groups in order to segregate those growing in the eastern and western portions of the United States. A few species range across the continent. A few species appear without a common name, chiefly because they have not been commonly recognized in the sections where they grow. In the Forest Service both the common and scientific names of trees are passed upon by a special committee named by the chief forester, to whom its recommendations are referred for approval.<sup>7</sup>

The list does not generally include the names of varietal forms or of hybrids, of which there are a few hundred recognized forms (see footnote 3), more largely among the oaks and buckeyes than any other groups. For example, the species white oak (*Quercus alba*) is given, but not the varietal form *Q. alba latiloba* or the hybrid *Q. fernowii*. No introduced, or exotic, trees are included although there are many, and some have found a congenial home here and become naturalized, such as the silverleaf poplar, chinaberry, paper and white mulberries, ailanthus, paulownia, Norway spruce, and Scotch pine. The more important or abundant species or kinds of trees growing in each broad forest region will be found listed under the descriptions of the several forest regions, pages 39 to 46.

### FOREST TREES OF THE UNITED STATES

The names of all the native tree species in the United States<sup>8</sup> are here given. Also the distribution of each is given in broad terms, and the descriptive notes include some of the leading characteristics. The trees are grouped under two divisions, namely Eastern Forest Trees and Western Forest Trees.

Unless otherwise stated the leaf arrangement on the stem is alternate. The order of listing the different trees is according to a natural sequence widely recognized and used by botanists. In general, it begins with the simplest or earliest group of trees and ends with the most highly developed group. For additional information concerning the range and characteristics, reference should be made to tree

<sup>6</sup> Except the hawthorns or haws (*Crataegus*) of the eastern part of the United States.

<sup>7</sup> In the preparations of this publication, particularly the following portion on forest trees, the author claims little originality in subject matter. On the other hand, the publication represents an attempt to present in a useful form information for handy reference that has been largely obtained by others. The basis for the names and ranges of the trees is the following, with subsequent approved amendments: SWD-WORTH, G. B. CHECK LIST OF THE FOREST TREES OF THE UNITED STATES: THEIR NAMES AND RANGES. U. S. Dept. Agr. Misc. Circ. 92, 295 pp. 1927. For much of the information about the less common trees summarized under the heads of Where the Tree Grows and Descriptive Notes, credit is due to various sources, including the following:

SARGENT, C. S. MANUAL OF THE TREES OF NORTH AMERICA (EXCLUSIVE OF MEXICO). Ed. 2, 910 pp., illus. Boston and New York. 1922.

COKER, W. C., and TOTTEN, H. R. TREES OF THE SOUTHEASTERN STATES, INCLUDING VIRGINIA, NORTH CAROLINA, SOUTH CAROLINA, GEORGIA, AND NORTHERN FLORIDA. 390 pp., illus. Chapel Hill, N. C. 1934.

JEPSON, W. L. THE SILVA OF CALIFORNIA. 480 pp., illus. Berkeley, Calif. 1910. (Calif. Univ. Mem. v. 2.)

<sup>8</sup> Except the hawthorns or haws (*Crataegus*) of the eastern half of the United States.

books or popular tree guides. A list showing the States which have published tree manuals will be found on pages 52 and 53.<sup>9</sup>

#### EASTERN FOREST TREES

The eastern division of forests of the United States, including the northern, central hardwood, southern, and tropical forest regions (fig. 7), has a total of 600 native tree species, representing 171 different genera, 67 families, and the 2 broad classes which embrace all trees.<sup>11</sup> Popularly the different species are distributed as follows: 30 conifers, 2 yews (tumion), 11 palms, 4 yuccas, 1 cactus, 175 hawthorns, and 377 species of willows, birches, oaks, hickories, elms, maples, gums, ashes, basswoods, and other hardwoods or broadleaf trees. Seventeen of these species are found growing also in the western forest division of trees (pp. 24 to 32), as follows: White spruce, dwarf juniper, aspen, balsam poplar, peachleaf and Bebb's willows, paper birch, wild plum, leucaena, pin cherry, honey mesquite, coralbean, hoptree, boxelder, red or green ash, buttonbush, and nannyberry.

An asterisk (\*) after a common name indicates that it is in common use, but is not officially approved by the Forest Service.

Name of tree	Where the tree grows	Descriptive notes
Northern white pine ( <i>Pinus strobus</i> )	Northeastern and Lake States, Appalachian Mountains. Extensively planted.	Leaves 5 in cluster, 3 to 5 inches long. Cone cylindrical, 4 to 8 inches long (fig. 1, H). Important timber tree.
Red pine,* or Norway pine ( <i>Pinus resinosa</i> )	Northeastern and Lake States. Extensively planted.	Leaves 2 in cluster, 5 to 6 inches long. Cone 2 inches long, without prickles (fig. 1, F). Important timber tree.
Loblolly pine ( <i>Pinus taeda</i> )-----	Southeastern States, coastal plain Delaware to Texas.	Leaves 3 in cluster, 6 to 9 inches long. Cone 2 to 3 inches long, with stiff sharp prickles (fig. 2, E). Important timber tree.
Pitch pine ( <i>Pinus rigida</i> )-----	Northeastern and Middle Atlantic States. Uplands mostly. (A variety, pond pine ( <i>Pinus rigida serotina</i> ) (fig. 2, G) in the coastal plain from Delaware to Florida.)	Leaves 3 in cluster, 3 to 7 inches long, stout, twisted. Cones short, broad, 2 to 3 inches long, with small prickles (fig. 1, H).
Virginia pine (scrub pine)* ( <i>Pinus virginiana</i> )	Uplands, New Jersey and Pennsylvania southwest to Alabama.	Leaves 2 in bundle, twisted, 2 to 3 inches long. Cone 2 to 3 inches long; very prickly.
Sand pine ( <i>Pinus clausa</i> ) -----	Florida and southern Alabama	Much like Virginia pine.
Mountain pine ( <i>Pinus pungens</i> )	Scattered in mountains, Pennsylvania to northern Georgia.	Leaves twisted, blue-green, 2 in bundle. Cone 3 inches long with stout curved spines.
Shortleaf pine ( <i>Pinus echinata</i> )	Middle Atlantic and Southern States, New Jersey to Missouri, Louisiana, and Texas. Uplands.	Leaves 2 or 3 in clusters, 3 to 5 inches long. Cone small, about 2 inches long; fine prickle (fig. 2, F). Important timber tree.
Spruce pine ( <i>Pinus glabra</i> )-----	Coast region South Carolina to Louisiana, along streams.	Leaves 2 in cluster, soft, slender, 2 to 3 inches long. Cones 1 to 2 inches long, with tiny prickles (fig. 2, A).
Jack pine ( <i>Pinus banksiana</i> )-----	Northern States, from Maine to Minnesota. Common on sandy soil.	Leaves 2 in cluster, up to 1½ inches long. Cone 1 to 2 inches long, incurved, irregular in shape.
Longleaf pine ( <i>Pinus palustris</i> )	Coastal Plain, North Carolina to Texas.	Leaves 3 in cluster, 8 to 18 inches long. Cone prickly, 6 to 10 inches long (fig. 2, D). Important tree for timber and naval stores.
Slash pine ( <i>Pinus caribaea</i> )-----	Coastal Plain, South Carolina south and west to Louisiana.	Leaves 2 or 3 in cluster, 8 to 14 inches long. Cone shiny, 3 to 5 inches long (fig. 2, G). Important for timber and naval stores.
Tamarack (larch)* ( <i>Larix laricina</i> )	Northeastern United States, northern Rocky Mountains.	Leaves 1 inch long, in clusters, falling in winter. Cone ¾ inch long (fig. 1, E).
Black spruce ( <i>Picea mariana</i> )	Northeastern and Lake States. Crosses continent in Canada.	Leaves blue-green, somewhat blunt pointed. Cone on incurved stalk, persistent for years; cone scales with rough edges. Twigs finely hairy. Important for pulpwood.

\* The common and scientific names used conform to those in Miscellaneous Circular 92,<sup>10</sup> with subsequent amendments.

<sup>10</sup> SUDWORTH, G. B. See footnote 7.

<sup>11</sup> Gymnosperms and angiosperms.

Name of tree	Where the tree grows	Descriptive notes
Red spruce ( <i>Picea rubra</i> )-----	Northeastern States, high Appalachian Mountains to North Carolina.	Leaves dark yellow-green. Cone falling soon after ripening (fig. 1, C). Important for pulpwood.
White spruce ( <i>Picea glauca</i> )-----	Northeastern and Lake States, northern Rocky Mountains (including Black Hills). Extends across the continent in Canada. (See p. 26.)	Leaves 4-sided, $\frac{1}{2}$ to $\frac{3}{4}$ inch long, pale blue-green, very sharp, twisting upward. Cone scales rounded (fig. 1, B). Important for pulpwood.
Eastern hemlock ( <i>Tsuga canadensis</i> ).-----	Northeastern and Lake States south to Ohio River, south in Appalachian Mountains.	Leaves $\frac{1}{2}$ inch long, apparently in flat arrangement on stem, shiny green, lighter below. Cone $\frac{3}{4}$ inch long (fig. 1, A). Timber tree; bark for tanning leather.
Carolina hemlock ( <i>Tsuga caroliniana</i> ).-----	Blue Ridge Mountains, Virginia to Georgia.	Resembles above tree. Cone scales longer than broad. Planted for ornament.
Southern balsam fir ( <i>Abies fraseri</i> ).-----	High Appalachian Mountains, Virginia south to North Carolina.	Resembles balsam fir, except cone is covered with protruding bracts (scale-covered).
Balsam fir ( <i>Abies balsamea</i> )-----	Northeastern States south to Virginia. Great Lakes States. Crosses continent in Canada.	Leaves not sharp-pointed, flexible, flattened, 1 inch long. Cone scales falling when ripe (fig. 1, G). Pulpwood tree.
Southern cypress ( <i>Taxodium distichum</i> ).-----	Atlantic Coastal Plain Delaware to Texas, central Mississippi Basin.	Leaves $\frac{3}{4}$ inch long, feather arrangement, falling in autumn. Cone round, of hard scales (fig. 2, B). Timber tree. In shallow ponds or stagnant swamps. Resembles above, except needlelike leaves, few knees.
Pond cypress ( <i>Taxodium ascendens</i> ).-----	Southeastern Virginia to western Florida and southern Alabama.	Leaves scalelike, crowded, resinous, aromatic. Cone resembling an opening scaly bud.
Northern white cedar ( <i>Thuja occidentalis</i> ).-----	Northeastern and Lake States, south in Appalachian Mountains. Canada.	Leaves scalelike, variable, opposite in pairs. Cone persistent, maturing in 1 season (fig. 2, C).
Southern white cedar ( <i>Chamaecyparis thyoides</i> ).-----	Coast, Maine to Florida and Mississippi. Irregularly scattered.	Leaves sharp, $\frac{1}{2}$ inch long. Sweet aromatic berrylike fruit, ripening in 3 years.
Dwarf juniper ( <i>Juniperus communis</i> ).-----	Northeastern quarter of United States, across the continent to California. (See p. 28.)	Leaves opposite, long-pointed, spreading at tips. Fruit reddish brown, maturing in 1 season.
Drooping juniper ( <i>Juniperus flaccida</i> ).-----	Southwestern Texas-----	Leaves red, ripening in 1 season. Leaves opposite or in threes.
Red-berry juniper ( <i>Juniperus pinchotii</i> ).-----	Northwestern Texas, central and southern Arizona.	Fruit 1-seeded, blue or nearly black. Branchlets and leaves small, leaves rough.
Mountain cedar ( <i>Juniperus mexicana</i> ).-----	Southern and western Texas, southwestern Oklahoma.	Leaves scalelike, on young shoots awl-shaped. Berries bluish, ripening in 1 season (fig. 4, B). Aromatic durable wood.
Eastern red cedar ( <i>Juniperus virginiana</i> ).-----	Eastern half of United States-----	Leaves tiny, usually opposite. Berries $\frac{1}{10}$ inch diameter, blue, ripening in 1 season. Drooping branchlets.
Southern red cedar ( <i>Juniperus lucayana</i> ).-----	Gulf coast region, Georgia to Texas.	Leaves $1\frac{1}{2}$ inches long, dull green, shiny, pointed. Purple berry. All parts of tree ill-smelling.
Stinking cedar ( <i>Tumion taxifolium</i> ).-----	Southwestern Georgia, western Florida (rare and local).	Leaves $\frac{1}{2}$ inch long, falling after 5 to 12 years. Fruit nearly surrounded by thick cup.
Florida yew ( <i>Taxus floridana</i> ).-----	Western Florida, very local-----	Leaves fan-shaped, 2 to 3 feet in diameter, yellow-green, shiny above. Fruit (berry) white.
Thatch palm ( <i>Thrinax floridana</i> ).-----	Southern Florida-----	Leaves 1 to 2 feet across, fan-shaped, pale green, shiny above. Fruit (berry) white.
Silvertop palmetto ( <i>Thrinax microcarpa</i> ).-----	Southern Florida (tropical)-----	Leaves 3 to 4 feet in diameter, fan-shaped.
Thatch palm ( <i>Thrinax keyensis</i> ).-----	do-----	Leaves 2 to 3 feet across, fan-shaped, pale green.
Thatch palm ( <i>Thrinax wendlandina</i> ).-----	do-----	Fruit berrylike, black. Leaves fan-shaped nearly round, $1\frac{1}{2}$ to 2 feet in diameter.
Thatch palm ( <i>Coccothrinax jucunda</i> ).-----	do-----	Trees up to 60 feet high and 2 feet in diameter. Leaves 5 to 6 feet long, 7 to 8 feet broad, shiny, fan-shaped. Leafbuds often eaten as food. Generally like the above.
Cabbage palmetto ( <i>Sabal palmetto</i> ).-----	Coast from North Carolina to western Florida.	Leaves thin, light green, in curved teeth. Tree often with many stems forming thickets.
Texas palmetto ( <i>Sabal texana</i> ).----- (Saw cabbage)* palm ( <i>Acoelorraphe wrightii</i> ).-----	Southern Texas----- Southwestern Florida (tropical).	Leaves 2 feet in diameter, yellow-green, with slight teeth. Trunks often lying on ground.
(Saw cabbage)* palm ( <i>Acoelorraphe arborescens</i> ).-----	Southwestern Florida-----	

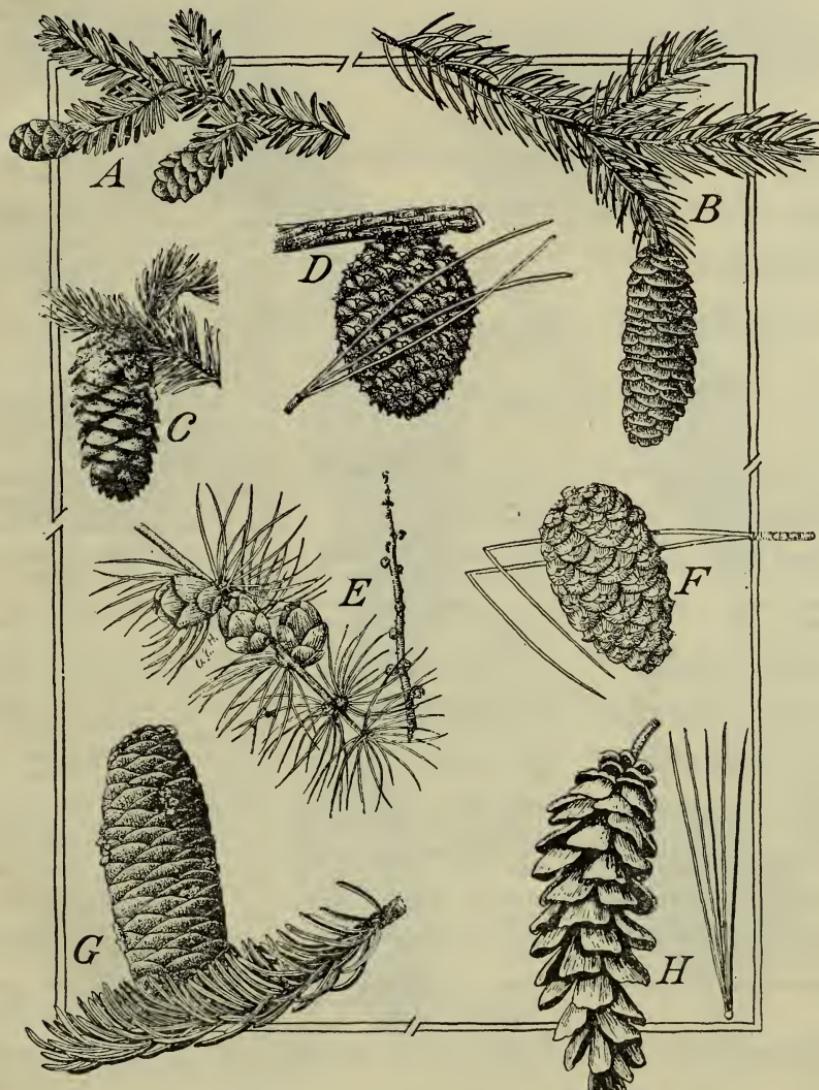


FIGURE 1.—Cones and leaves of conifers which characterize the northern forest region: A, eastern hemlock (p. 6); B, white spruce (p. 6); C, red spruce (p. 6); D, pitch pine (p. 5); E, tamarack (p. 5); F, red (Norway) pine (p. 5); G, balsam fir (p. 6); H, northern white pine (p. 5); (see also p. 39).

Name of tree	Where the tree grows	Descriptive notes
Royal palm ( <i>Roystonea regia</i> )-----	Southern Florida (tropical)-----	Leaves featherlike along the rhacis (or central leaf stem), 10 feet long, no teeth or spines. Fruit blue. Extensively cultivated for its beauty. Resembles above, leaves 5 to 6 feet long. Fruit clusters bright scarlet.
Hog cabbage palm ( <i>Pseudophoenix vinifera</i> ). Spanish bayonet ( <i>Yucca aloijolia</i> ).	do----- Coast from North Carolina to Florida and Louisiana (tropical).	Leaves 1 to 2 feet long, 1 to 2 inches wide, sharply toothed along edges. (This and the next 2 trees belong to the lily family. They differ mostly in their flowers.)
Spanish dagger ( <i>Yucca gloriosa</i> ). Spanish bayonet ( <i>Yucca treculeana</i> ). Spanish bayonet ( <i>Yucca faxoniana</i> ).	South Atlantic coast----- Coast and Rio Grande River in Texas. Southwestern Texas, desert region.	Leaves thin, flat. Fruit mostly upright or spreading. Leaves rough below, concave, finely toothed, bluish-green, 3 feet long. Fruit on stem, fleshy. Leaves 3 to 4 feet long, flat, smooth. Flowers forming narrow tube at base. Fruit shiny, orange colored.
Butternut (white walnut)* ( <i>Juglans cinerea</i> ).	Northeastern States and southern Appalachian Mountains.	Leaves 15 to 30 inches long, of 11 to 17 leaflets. Nut longer than thick. Velvety cushion above leaf scar (fig. 5, F).
Black walnut ( <i>Juglans nigra</i> )-----	New York west to Iowa and southward.	Leaves 12 to 24 inches long, of 15 to 23 leaflets. Nut round. Bark rich brown (fig. 4, F). High-grade cabinet wood.
Pecan ( <i>Hicoria pecan</i> )-----	Mississippi Valley, Iowa to Texas.	Leaves of 9 to 17 leaflets; bud scales few. Nut with thin brittle shell and sweet kernel. Many varieties grown on commercial scale throughout the South.
Bitter pecan ( <i>Hicoria terana</i> )-----	Along rivers from Arkansas to Texas.	Leaves of 7 to 13 leaflets. Nut flattened with bitter kernel.
Bitternut hickory ( <i>Hicoria cordiformis</i> ).	Eastern United States to Great Plains.	Leaves of 7 to 9 long-pointed leaflets. Nut broad, thin-husked, with bitter kernel.
Nutmeg hickory ( <i>Hicoria myristicaeformis</i> ).	Coastal Plain region, South Carolina west to Texas.	Leaves of 7 to 9 leaflets, silvery and shiny below. Nut 4-ridged, 1½ inches long.
Water hickory ( <i>Hicoria aquatica</i> ).	South Atlantic and Gulf coastal region. Mississippi Valley.	Nut flattened, 4-ridged, thin husk, bitter kernel. Leaves of 7 to 13 leaflets.
Shagbark hickory (scaly bark hickory)* ( <i>Hicoria ovata</i> ).	Eastern United States (exclusive of southern coastal region).	Bark loosening in narrow strips. Leaves of 5 large leaflets. Nut thick-shelled, with sweet kernel.
Southern shagbark hickory ( <i>Hicoria carolinina septentrionalis</i> ).	Southern Appalachian region largely on limestone soils.	Leaves small, mostly of 5 slender leaflets. Nut 4-angled, thin-shelled, with sweet kernel.
Bigleaf shagbark hickory (shell-bark hickory)* ( <i>Hicoria laciniata</i> ).	Eastern United States, exclusive of New England.	Leaves large, 15 to 20 inches long, mostly of 7 leaflets. Nut large, with sweet kernel.
Mockernut hickory (white or bigbud hickory)* ( <i>Hicoria alba</i> ). (Swamp)* pignut hickory ( <i>Hicoria leiodermis</i> ).	Southeastern quarter of United States and a little northward. Arkansas, Mississippi, Louisiana.	Winter buds large. Leaves broad, of 7 to 9 leaflets, strong-scented, hairy. Nut thick-shelled, small sweet kernel.
Hickory ( <i>Hicoria mollissima</i> ). (Sand)* pignut hickory ( <i>Hicoria pallida</i> ).	Mississippi, Louisiana, and Texas. Atlantic and Gulf coastal region.	Leaves of 7 long-pointed leaflets. Nut smooth, shell thick, small sweet kernel.
Pignut hickory ( <i>Hicoria glabra</i> )-----	Vermont to Michigan and south in Appalachian Mountains and foothills.	Leaves like above but velvety or hairy.
(Hammock)* hickory ( <i>Hicoria ashei</i> ).	Florida and adjacent coastal regions.	Leaves of 7 narrow, finely toothed, fragrant, long-pointed leaflets. Nut white, with sweet kernel.
(Red)* pignut hickory ( <i>Hicoria ovalis</i> )	Pennsylvania west to Illinois, south in mountains and foothills. Common and widely distributed, along with pignut hickory.	Nut smooth, thick-shelled, sweet kernel, rounded or pear-shaped. Leaves of 5 pointed leaflets (fig. 5, E).
(Scrub)* hickory ( <i>Hicoria floridana</i> ).	Northern and central Florida.	Branchlets stout, reddish. Leaves usually of 7 leaflets, with reddish leafstalks. Nut small, thin-husked, small sweet kernel.
(Black)* hickory ( <i>Hicoria buckleyi</i> ).	Central States, Indiana to Louisiana and eastern Texas.	Leaves small, usually of 5 leaflets. Nut ½ inch diameter, pointed at base.
Pignut hickory (black hickory)* ( <i>Hicoria villosa</i> ).	Illinois, Missouri, Arkansas, Oklahoma.	Leaves 8 to 12 inches long, usually of 7 shiny leaflets. Nut pointed, 4-angled, with sweet kernel. Resembling the above, but lower side midrib often fuzzy and with longer hair clusters.

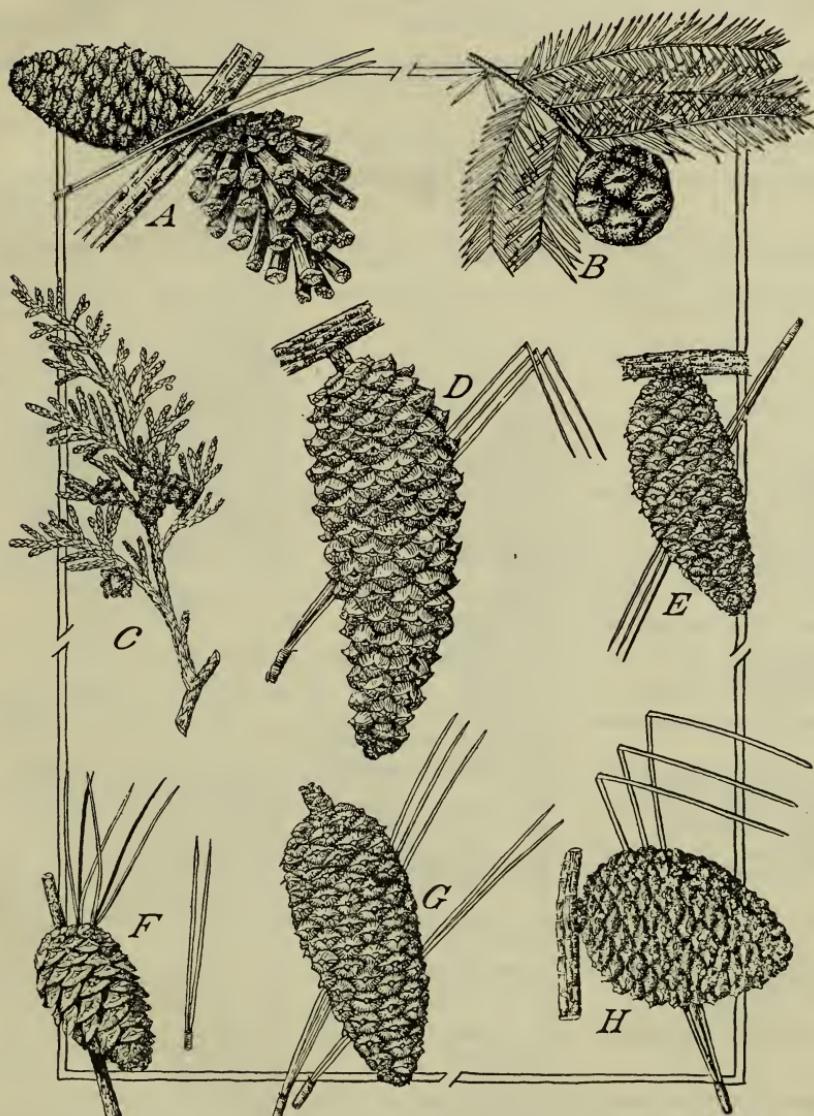


FIGURE 2.—Cones and leaves of most of the conifers of the southern forest region: *A*, Spruce pine (p. 5); *B*, southern cypress (p. 6); *C*, southern white cedar (p. 6); *D*, longleaf pine (p. 5); *E*, loblolly pine (p. 5); *F*, shortleaf pine (p. 5); *G*, slash pine (p. 5); *H*, pond pine (see p. 5, pitch pine).

Name of tree	Where the tree grows	Descriptive notes
Wax myrtle ( <i>Myrica cerifera</i> )---	Coastal region, New Jersey to Texas.	Wax coated berries in clusters. Leaves broader at outer end, fragrant.
Wax myrtle ( <i>Myrica inodora</i> )---	Florida to Louisiana.	Leaves not toothed; little odor.
Corkwood ( <i>Leitneria floridana</i> )---	Gulf coast region and lower Mississippi Valley.	Lightest of all native woods. Leaves 4 to 6 inches long, shiny. Fruit $\frac{3}{4}$ inch long, podlike.
Aspen (popple)* ( <i>Populus tremuloides</i> ).	Northern United States; south in Rocky Mountains. Nearly across Canada. (See also p. 28.)	Leaves broad, finely toothed; leafstalks flat and long.
Largetooth aspen ( <i>Populus grandidentata</i> ).	Maine west to North Dakota, south in mountains to North Carolina.	Leaves coarsely toothed, broad, with flattened leafstalks.
Swamp cottonwood ( <i>Populus heterophylla</i> ).	Atlantic and Gulf coasts, central Mississippi.	Leaves broadly oval, 4 to 7 inches long, with rounded leafstalks, finely woolly when young. Buds resinous (fig. 3, E).
Balsam poplar (balm-of-Gilead)* ( <i>Populus balsamijera</i> ).	Across northern United States and Canada. (See also p. 28.)	Leaves dull-toothed; leafstalks rounded. Winter buds $\frac{1}{2}$ inch long, shiny, resinous.
Eastern cottonwood (Carolina poplar)* ( <i>Populus deltoides</i> ).	Eastern half of United States.	Leaves triangular, coarsely toothed, fragrant, with flattened stems. Buds resinous.
Cottonwood ( <i>Populus palmeri</i> )	Southwestern Texas.	Leaves finely toothed; leafstalks flattened.
Cottonwood ( <i>Populus texana</i> )	Northwestern Texas (Panhandle).	Leaves coarsely toothed; leafstalk flattened.
Black willow ( <i>Salix nigra</i> )-----	Eastern half of United States, along streams, not in swamps.	Leaves slender, long-pointed, finely toothed. Branchlets reddish. Largest of the willows.
Harbinson willow ( <i>Salix harbinsonii</i> ).	Coast, Virginia to Florida.	Leaves whitish below, on short stems.
Peachleaf willow ( <i>Salix amygdaloides</i> ).	Northern United States, south in Rocky Mountains. (See also p. 29.)	Leaves long, pointed (peachleaf), pale below.
Willow ( <i>Salix longipes</i> )-----	North Carolina to Florida.	Leaves lance shape, leafstems hairy.
Shiny willow ( <i>Salix lucida</i> )-----	Northeastern quarter United States.	Leaves shiny above, pale below, ovate.
Sandbar willow ( <i>Salix longifolia</i> )-----	Eastern and Rocky Mountain regions.	Leaves 4 inches long, smooth.
Balsam willow ( <i>Salix pyrifolia</i> )-----	Extreme northern New England.	Leaves broad, plum shape.
Missouri River willow ( <i>Salix missouriensis</i> ).	Central Mississippi River Basin.	Branchlets hairy.
Pussy willow ( <i>Salix discolor</i> )-----	Northeastern quarter of United States.	Leaves broad, shiny, and silky below.
(Bebbs)* willow ( <i>Salix bebbiana</i> )	Northern United States, south in Rocky Mountains. (See also p. 29.)	Leaves elliptical, silvery white below.
Blue beech (water beech)* ( <i>Carpinus caroliniana</i> ).	United States east of the Great Plains.	Trunk fluted with ridges, bluish gray. Leaflike wing attached to seed.
Hophornbeam (ironwood)* ( <i>Ostrya virginiana</i> ).	United States and Canada east of the Great Plains.	Thin brown scaly bark. Fruit resembling hops, each seed in bag. Leaves doubly toothed.
Sweet birch (black birch)* ( <i>Betula lenta</i> ).	Maine to Michigan, Appalachian Mountains to Georgia and Alabama.	Young inner bark aromatic (source of wintergreen flavoring). Fruit of all birches is of 2 kinds of catkin borne on same tree (fig. 5, H). Timber tree. Bark peeling in yellow-brown curls. Leaves rounded in outline. Timber tree.
Yellow birch ( <i>Betula lutea</i> )-----	Maine to Minnesota, south in mountains to Georgia.	Bark red-brown, peeling in tough layers. Leaves oval, 2 to 3 inches long, narrowed at base, doubly toothed.
River birch (red birch)* ( <i>Betula nigra</i> ).	Southern New England, west to Minnesota, south to Texas. Along streams.	Trunks small, dull gray bark. Twigs drooping; leaves triangular, long-pointed, shiny. Small, short-lived tree.
Gray birch ( <i>Betula populifolia</i> )	New England, New York, Pennsylvania, and Delaware.	Leaves dull blue-green above, yellow-green below, oval, long-pointed.
Blueleaf birch ( <i>Betula coerulea</i> )	Scattered in northern New England.	Bark pure white to light gray, separating in thin sheets. Leaves thick rounded at base.
Paper birch (canoe birch)* ( <i>Betula papyrifera</i> ).	New England across the northern States to Pacific, south in Appalachians. (See also p. 29.)	Flowers opening in fall.
Seaside alder ( <i>Alnus maritima</i> )	Delaware, Maryland, Oklahoma.	Leaves toothed, flat, thin, firm. Triangular edible nuts (fig. 5, G).
Beech ( <i>Fagus grandifolia</i> )-----	Eastern half of United States. A widely ranging tree.	Leaves smaller than above, shallow teeth. Burs of all chinquapins have 1 nut each.
Chinquapin ( <i>Castanea pumila</i> )	Pennsylvania to Florida and Texas.	Leaves densely woolly beneath. Fruit spines stout.
Chinquapin ( <i>Castanea ashei</i> )-----	Lower Atlantic and Gulf coast regions.	Leaves rounded at end, narrowed at base. Bur with sparse spines.
Chinquapin ( <i>Castanea alnifolia</i> <sup>1</sup> <i>floridana</i> ).	Coastal region North Carolina to Louisiana.	

1 An unusual case of a varietal name only.



FIGURE 3.—Leaves, fruit or flowers, and twigs of some hardwoods occurring chiefly in the southern forest region; A, water oak (p. 12); B, live oak (p. 14); C, winged elm (p. 14); D, sweet, or red gum (p. 16); E, swamp cottonwood (p. 10); F, swamp black gum (p. 22); G, tupelo gum (p. 22); H, overcup oak (p. 14). (See also p. 41.)

Name of tree	Where the tree grows	Descriptive notes
Chinquapin ( <i>Castanea floridana</i> <sup>1</sup> <i>margareta</i> ). (Ozark)* chinquapin ( <i>Castanea ozarkensis</i> ).	Gulf States region, Alabama to Arkansas. Northwestern Arkansas, southwestern Missouri, eastern Oklahoma. Northwestern Alabama-----	Leaves shiny beneath. Leaves 5 to 10 inches long, long-pointed, toothed. Bur large with much-prized nut. Good-sized tree. Leaves large, nearly smooth below. Spines fuzzy.
Chinquapin ( <i>Castanea alabamensis</i> ). Chestnut ( <i>Castanea dentata</i> )-----	Northeastern States and Appalachian region to Florida.	Leaves long, coarsely toothed, pointed. Spiny bur with edible nuts. Trees mostly killed back by blight disease. Acorn large, in flat shallow cup (fig. 5, D). Leaves mostly with 7 to 11 uniform lobes, 6 to 9 inches long, dull above, green below. High-grade timber tree. (Beginning the black oak group which has pointed leaf lobes and requires 2 seasons to mature the acorns.)
Northern* red oak ( <i>Quercus borealis</i> ).	Northeastern quarter of United States, south in Appalachian Mountains and cool locations along streams. (Variety. <i>Maxima</i> important in southern Appalachian region).	Leaves small, deeply (mostly 5) lobed, with hair clusters in axils of veins and midrib. Acorn small, in saucer-shaped cup. Branches numerous, drooping.
Pin oak ( <i>Quercus palustris</i> )-----	Eastern United States-----	Leaves 3- to 5-lobed. Acorn $\frac{1}{2}$ inch long, in flat cup.
Georgia oak ( <i>Quercus georgiana</i> )-----	Central northern Georgia-----	Leaves 3 inches long, 5- or 7-lobed. Acorn $\frac{3}{4}$ to 1 inch long in deep cup.
Texas red oak ( <i>Quercus texana</i> )-----	Central and western Texas-----	Leaves deeply or shallowly lobed, leafstalks slender. Acorn in shallow cup.
Shumard red oak ( <i>Quercus shumardii</i> )-----	Southeastern quarter of United States.	Similar to Texas red oak, but the leaves have sharp-pointed lobes and the acorns small cups.
Graves oak ( <i>Quercus gravesii</i> )-----	Southwestern Texas-----	Leaves shiny, deeply and roundly lobed, 3 to 5 inches long. Acorn top shaped, often striped.
Jack oak ( <i>Quercus ellipsoidalis</i> )-----	Michigan to Iowa and Minnesota.	Leaves with deep rounded sinuses, lobes pointed. Acorn large, often striped, in medium cup.
Scarlet oak ( <i>Quercus coccinea</i> )-----	Northeastern United States. Maine to Missouri, mountains to Georgia.	Leaves mostly 7-lobed, the lower ones rather full, others more deeply lobed. Acorn deeply enclosed in scaly cup. Inner bark orange.
Black oak ( <i>Quercus velutina</i> )-----	Eastern half of United States, except Lake States region.	Leaves smaller, narrower and smoother than black oak.
Smoothbark oak ( <i>Quercus leiodermis</i> ). Turkey oak ( <i>Quercus catesbeiae</i> )-----	Missouri and northward. Coastal plain, Virginia to Louisiana.	Leaves of few prominent curved lobes. Acorn, full rounded in flat cup.
Bear oak, (scrub oak)* ( <i>Quercus ilicifolia</i> ) ( <i>Quercus nana</i> )*. Southern red oak ( <i>Quercus rubra</i> )-----	Northeastern United States, south in Mountains. Southeastern United States. Abundant.	Leaves small, thick, silvery below. Small tree or shrub. Leaves urn-shaped at base, with finger-like lobes or a 3-pointed outer end. Acorn $\frac{1}{2}$ inch long in flat cup (fig. 4, E). Important timber tree.
Nuttall oak (Red River oak) ( <i>Quercus nuttallii</i> ) <sup>2</sup>	Mississippi Delta region, first and second bottoms.	Bark smooth and tight, light to dark grayish-brown. Leaves dull dark green, usually 5 to 7 lobes. Acorn oblong-ovoid, $\frac{3}{4}$ to $\frac{1}{2}$ inches long and usually striped.
Blackjack oak ( <i>Quercus marilandica</i> ). Water oak ( <i>Quercus nigra</i> )-----	Eastern United States, except New England. Southeastern United States-----	Leaves full, thick, dark green, shiny. Acorn small, in medium cup.
(Arkansas)* water oak ( <i>Quercus arkansana</i> ). Water oak ( <i>Quercus obtusa</i> )-----	Southwestern Arkansas----- Southeastern United States-----	Leaves nearly evergreen, oblong with narrowing base, not toothed, but sometimes 3-lobed. Acorn small in shallow cup.
Willow oak ( <i>Quercus phellos</i> )-----	Atlantic and Gulf coastal region, New York to Texas.	Leaves resembling above, but broader at outer end. Acorn $\frac{1}{2}$ inch long.
Laurel oak ( <i>Quercus laurifolia</i> )-----	Coastal plain, North Carolina to Louisiana.	Leaves not lobed or toothed, widest beyond the middle, end rounded, narrowed at base (fig. 3, A).
Blue-jack oak (upland willow oak)* ( <i>Quercus cinerea</i> ).	Coastal plain, Virginia to Texas.	Leaves narrow, willowlike, smooth, 2 to 5 inches long. Acorn small, striped lengthwise, in shallow cup.
Shingle oak ( <i>Quercus imbricaria</i> )-----	Central-eastern United States.	Leaves glossy, dark green, elliptical, 3 to 4 inches long, smooth on lower surface, evergreen. Bark dark, rather smooth (black oak group).
Myrtle oak ( <i>Quercus myrtifolia</i> )-----	On coast and islands, South Carolina to Mississippi.	Small tree with blue-green leaves, densely woolly below. Acorn small, striped, soft, hairy.

<sup>1</sup> An unusual case of a varietal name only.

<sup>2</sup> PUTNAM, J. A., and BULL HENRY. The Trees of the Bottomlands of the Mississippi River Delta Region. 207 pp. So. For. Expt. Sta.

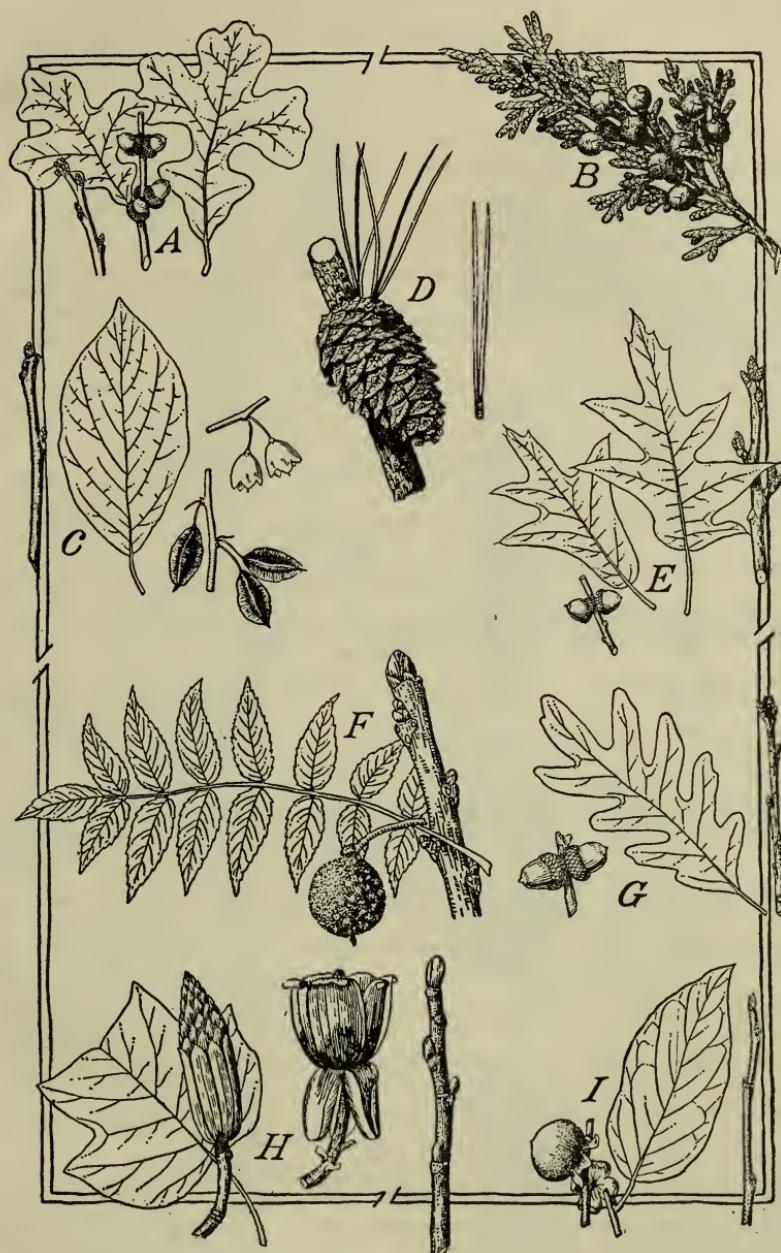


FIGURE 4.—Leaves, fruit or flowers, and twigs of a few trees which compose the central hardwood forest region: A, Post oak (p. 14); B, eastern red cedar (p. 6); C, silverbell (p. 22); D, shortleaf pine (p. 5); E, southern red oak (p. 12); F, black walnut (p. 8); G, white oak (p. 14); H, yellow or tulip poplar (p. 16); I, persimmon (p. 22). (See also p. 40.)

Name of tree	Where the tree grows	Descriptive notes
Live oak ( <i>Quercus virginiana</i> )-----	South Atlantic and Gulf coasts, Virginia to Texas.	Leaves oblong, edges smooth but incurved, thick, pale, fuzzy below, evergreen (fig. 3, B). Bark grayish. Acorn borne on long stem (peduncle). (Beginning the white oak group, whose leaf lobes are rounded and whose acorns mature in 1 season.)
Shin oak ( <i>Quercus vaseyana</i> )-----	Western Texas-----	Leaves with small lobes, wavy margins.
Shin oak ( <i>Quercus mohriana</i> )-----	Western Texas and Oklahoma-----	Leaves narrow, gray-green, thick. Acorn in deep cup.
Shin oak ( <i>Quercus laceyi</i> )-----	Western Texas-----	Leaves wavy-edged or 3-lobed. Acorn in shallow cup.
Shin oak ( <i>Quercus annulata</i> )-----	Central and western Texas-----	Leaves variable. Acorn in rounded cup.
Durand white oak ( <i>Quercus durandii</i> ). Chapman white oak ( <i>Quercus chapmanii</i> ). White oak (forked-leaf white oak) * ( <i>Quercus alba</i> ).	Southern Gulf region, Georgia to Texas. Southeastern United States, South Carolina to Florida. Eastern half of United States-----	Leaves widening toward apex where slightly lobed. Acorn in flat cup. Leaves oblong, wavy margin. Acorn without stem (sessile). Leaves deeply and wavy lobed. Acorn in low flat cup (fig. 4, G). Important timber tree.
Post oak ( <i>Quercus stellata</i> )-----	Central and southern United States, Massachusetts to Texas.	Leaves like Maltese cross, thick, leathery, woolly below. Acorn close to branchlet, in deep cup (fig. 4, A).
Bastard white oak ( <i>Quercus austrina</i> ). Bur oak ( <i>Quercus macrocarpa</i> )-----	Southern United States, South Carolina to Mississippi. Northeastern and North Central United States.	Leaves 5-lobed, shiny, smooth below. Acorn in deep cup.
Overcup oak ( <i>Quercus lyrata</i> )-----	Atlantic and Gulf coasts, New Jersey to Texas. Near water.	Leaves deeply lobed and notched, broadest toward apex. Acorn enclosed in mossy or scaly cup.
Swamp white oak ( <i>Quercus bicolor</i> ). Swamp chestnut oak (basket oak)*, (cow oak)* ( <i>Quercus prinus</i> ). Chestnut oak (rock oak)* ( <i>Quercus montana</i> ).	Northeastern quarter of United States. In low or cool ground. Central and southern United States, New Jersey to Missouri. Borders of streams or swamps. Northeastern and central United States.	Leaves narrow with shallow lobes; acorn nearly enclosed in fringed cup (fig. 3, H.). Leaves notched and lobed, whitish below. Acorn large in heavy cup.
Chinquapin oak ( <i>Quercus muehlenbergii</i> ). Dwarf chinquapin oak (scrub oak)* ( <i>Quercus prinoides</i> ). American elm (white elm)* ( <i>Ulmus americana</i> )	Central part of eastern United States. Central part of eastern United States. Eastern half of United States to the Great Plains.	Leaves large, coarsely notched, often silvery below. Acorn large, shiny.
Rock elm ( <i>Ulmus racemosa</i> )-----	Belt across northeastern States to Kansas.	Leaves coarsely notched. Acorn large, shiny, in warty cup. Bark extensively used for tanning leather.
Winged elm (wahoo)* ( <i>Ulmus alata</i> ). Slippery elm ( <i>Ulmus fulva</i> )-----	Southeastern quarter of United States. Eastern United States-----	Leaves oblong, sharply notched, silvery on lower side. Acorn sweet, edible (if roasted). Leaves smaller than the above, teeth shorter.
Cedar elm ( <i>Ulmus crassifolia</i> ). Red elm ( <i>Ulmus serotina</i> )-----	Mississippi, southern Arkansas, across central and southern Texas. Kentucky south to Georgia and west into Missouri, Arkansas, and Oklahoma. Southern United States.	Leaves doubly and sharply toothed, smooth above. Wings of seed with tiny hairs (fig. 5, A). Large tree with drooping branches. Extensively planted.
Planer tree (water elm)* ( <i>Platanus aquatica</i> ). (Roughleaved)* hackberry ( <i>Celtis occidentalis</i> ). Sugarberry (southern hackberry)* ( <i>Celtis laevigata</i> ). Palo blanco ( <i>Celtis lindheimeri</i> ). Hackberry ( <i>Celtis pumila georgiana</i> ). (Name?) <i>Trema mollis</i> . Red mulberry ( <i>Morus rubra</i> )-----	Most of northeastern United States. Southeastern quarter of United States. Southern Texas-----	Branchlets often with corky wings Leaves smooth above, soft hairy below. Winged seeds hairy. Leaves small, variable in size. Seeds winged, hairy (fig. 3, C). Young twigs often corky. Planted for shade and ornament in South. Leaves rough, hairy above, soft downy below. Winged seeds, not hairy on edges. Inner bark mucilaginous. Leaves 1 to 2 inches long, coarsely toothed, rough above. Flowers and fruit late. Flowers in late summer. Seeds ripen late fall, hairy. Tree upright in habit of growth. Leaves resembling those of elms. Fruit small nutlike. Leaves oval, thin, broad near base, long pointed. Seed in a purple berry. Leaves long, narrow, smooth on edges. Fruit nutlike, red or orange. Leaves smaller than those of sugarberry. Fruit red-brown. Leaves 2 inches long, thin, rough above. Fruit red-purple with bloom. Leaves in 2 rows, 3 to 4 inches long. Leaves thin, variably heart-shaped, sharply toothed. Fruit red or black.



FIGURE 5.—Leaves, fruit, and twigs of hardwood trees characteristic of the northern forest region: *A*, American elm (p. 14); *B*, white ash (p. 23); *C*, sugar maple (p. 20); *D*, northern red oak (p. 12); *E*, pignut hickory (p. 8); *F*, butternut (p. 8); *G*, beech (p. 10); *H*, sweet (or black) birch (p. 10); (see also p. 39).

Name of tree	Where the tree grows	Descriptive notes
Osage-orange (bois d'arc)* ( <i>Toxylon pomiferum</i> ).	Arkansas, Oklahoma, Texas. Widely spread by planting.	Leaves smooth, shiny, 3 to 5 inches long, deep green. Fruit a multiple orange with milky flesh. Twigs thorny. Wood very durable in ground.
Golden fig ( <i>Ficus aurea</i> ) . . . . .	Southern Florida (tropical) . . . . .	Leaves oblong, leathery, evergreen. Fruit rounded.
Wild fig ( <i>Ficus brevifolia</i> ) . . . . .	do . . . . .	Leaves broader than above, thin.
Whitewood ( <i>Schoepfia chrysophylla</i> ).	do . . . . .	Leaves elliptical, 1 to 3 inches long. Fruit small with stone seed.
Tallowwood ( <i>Ximenia americana</i> ).	do . . . . .	Leaves oblong, shiny. Fruit round, yellow.
Seagrape ( <i>Coccolobis uvifera</i> ) . . . . .	do . . . . .	Leaves round, 4 to 5 inches in diameter.
Pigeon-plum ( <i>Coccolobis laurifolia</i> ).	do . . . . .	Leaves oval, thick. Fruit clustered.
Bilberry ( <i>Torrbia longifolia</i> ) . . . . .	do . . . . .	Leaves small. Fruit bright red, clustered.
Evergreen magnolia ( <i>Magnolia grandiflora</i> ) . . . . .	South Atlantic and Gulf coasts (widely planted for ornament).	Leaves thick, glossy, 5 to 8 inches long, evergreen. Fruit, head of many bright red seeds. Flowers large, white.
Sweet bay ( <i>Magnolia virginiana</i> ) . . . . .	Coastal region, Massachusetts to Florida and Texas.	Leaves oblong, pale green, whitish below. Seeds scarlet. Flowers white, sweet.
Cucumber magnolia ( <i>Magnolia acuminata</i> ).	Central and Southern States, Ohio to Georgia and Arkansas.	Leaves oblong, wavy edges. Head of scarlet seeds. Flowers greenish. Large timber tree.
Yellow-flowered magnolia ( <i>Magnolia cordata</i> ).	North Carolina, Georgia, Alabama. Rare, mostly in cultivation.	Flowers bright canary yellow. Leaves broad, rounded, thick; branchlets hairy.
Bigleaf magnolia ( <i>Magnolia macrophylla</i> ).	Southern end of Appalachian Mountains, Gulf States.	Leaves 20 to 30 inches long, heart-shaped at base. Flowers large, white, fragrant.
(Florida)* magnolia ( <i>Magnolia Ashei</i> ).	Western Florida . . . . .	Resembles big leaf magnolia, but with smaller flowers, fruit, and twigs.
Umbrella magnolia (umbrella-tree)* ( <i>Magnolia tripetala</i> ).	Southeastern quarter of United States.	Leaves 14 to 22 inches long, crowded at ends of branches. Flowers ill-scented.
Mountain magnolia ( <i>Magnolia fraseri</i> ).	Southern Appalachian Mountains, Virginia to Alabama.	Leaves eared at base, 10 to 12 inches long, crowded. Flowers pale yellow.
Mountain magnolia ( <i>Magnolia pyramidata</i> ).	Gulf coast region of Georgia, Florida, Alabama.	Leaves very narrow and eared at base, 5 to 8 inches long. Flowers white.
Yellow poplar (tulip poplar),* (tuliptree)* ( <i>Liriodendron tulipifera</i> ).	Southern New England to Michigan and Southern States.	Leaves squared, with lobe on sides. Flowers greenish - yellow, tulip shaped. Fruit a cone of winged seed (fig. 4, H). Important timber tree.
Papaw ( <i>Asimina triloba</i> ) . . . . .	Eastern United States, except northern portion.	Leaves narrowed toward base, 8 to 10 inches long. Fruit pulpy, edible.
Pond-apple ( <i>Anona glabra</i> ) . . . . .	Southern Florida (tropical) . . . . .	Leaves leathery. Fruit pear-shaped, fleshy.
Red bay ( <i>Persea borbonia</i> ) . . . . .	South Atlantic and Gulf coasts to Texas.	Leaves evergreen, oblong, thick, bright green, orange-colored midrib. Fruit fleshy, nearly black.
Swamp bay ( <i>Persea pubescens</i> ) . . . . .	Coast of Southern States . . . . .	Leaves elliptical, 5 inches long, evergreen.
Lancewood ( <i>Ocotea catesbyana</i> ) . . . . .	Southern Florida (tropical) . . . . .	Leaves narrowed at both ends, leathery, shiny, evergreen. Fruit dark blue, round.
Sassafras ( <i>Sassafras variifolium</i> ) . . . . .	Eastern United States . . . . .	Leaves variable in shape. Leaves, twigs, and especially inner bark on roots aromatic. Close relative of camphor-tree of Asia.
(Name?) ( <i>Misanthea triandra</i> ) . . . . .	Southern Florida (tropical) . . . . .	Leaves elliptical, evergreen. Fruit olive-shaped.
Caper tree ( <i>Capparis jamaicensis</i> ).	do . . . . .	Leaves 2 to 3 inches long, rounded at ends, leathery, shiny. Fruit, long pod.
(Caper tree)* ( <i>Capparis cynophallophora</i> ).	do . . . . .	Leaves scaly. Fruit pulpy.
Witch hazel ( <i>Hamamelis virginiana</i> ).	Eastern United States . . . . .	Leaves deeply veined, with wavy margin. Flowering in fall.
(Southern)* witch hazel ( <i>Hamamelis macrophylla</i> ).	Gulf coast region (Georgia to Texas), Oklahoma.	Leaves rounded, wavy-edged, hairy. Flowers, December to February.
Sweet gum* or red gum ( <i>Liquidambar styraciflua</i> ).	Southeastern quarter of United States.	Leaves star-shaped, aromatic. Fruit a spiny ball of many capsules with seeds (fig. 3, D). Large tree. Important timber tree.
Sycamore ( <i>Platanus occidentalis</i> ).	Eastern half of United States. Moist or cool locations.	Bark gray, flaking off. Leaves large, broad, lobed. Balls single, hanging by slender stem over winter. Largest of all hardwood trees—up to 10 feet in diameter and 170 feet in height.

Name of tree	Where the tree grows	Descriptive notes
Narrowleaf crab apple ( <i>Malus angustifolia</i> ).-	Southeastern United States, except in mountains.	Leaves oblong, bluntly toothed, firm. Fruit round, yellow-green, fleshy. (Most of the crab apples have sharp spines on branchlets.)
Crab apple ( <i>Malus glaucescens</i> )-	Appalachian Mountains and Plateau.	Leaves toothed, coarsely notched, whitish below. Fruit pale yellow.
Crab apple ( <i>Malus glabrata</i> )-----	Western North Carolina -----	Leaves triangular, sharply lobed, toothed.
Sweet crab apple ( <i>Malus coronaria</i> ).-	Central eastern United States.	Leaves oval, finely toothed. Fruit yellow-green.
Crab apple ( <i>Malus bracteata</i> )-----	Kentucky to Missouri, southward.	Leaves oval, pointed, toothed. Fruit round.
Crab apple ( <i>Malus platycarpa</i> )--	Central Appalachian region---	Leaves rounded ovate, finely toothed. Fruit flattened.
Lanceleaf crab apple ( <i>Malus lancifolia</i> ).	Central eastern United States.	Leaves broadly lance-shaped, thin.
Crab apple ( <i>Malus ioensis</i> )-----	Central Mississippi Basin-----	Leaves fuzzy beneath, notched and toothed.
Soulard crab apple ( <i>Malus sou-lardii</i> ).	Minnesota to Texas (not abundant).	Leaves oval, or elliptical, hairy on lower surface. Fruit 2 inches in diameter.
Mountain-ash ( <i>Sorbus americana</i> ).-	Northeastern United States. Widely planted for ornament.	Leaves of 13 to 17 leaflets, sharply toothed. Fruit in cluster, bright orange-red.
Serviceberry (shadbush)* ( <i>Amelanchier canadensis</i> ).-	Eastern half of United States..	Flowers white, appearing before the leaves. Leaves thin, oval, finely toothed.
Serviceberry ( <i>Amelanchier laevis</i> ).-	Maine to Wisconsin, southward.	Flowers appearing after the leaves. Berries pulpy, sweet.
Hawthorn, haw, thorn, thorn-apple, apple, or thorn ( <i>Crataegus</i> species) (178 different species recognized in the United States).	Eastern United States, with 175 species (most numerous in Southern States); 3 species in western United States.	Small trees, mostly with stiff crooked branchlets, armed with sharp spines. Leaves mostly rounded, broader toward apex, sharply toothed or slightly lobed. Flowers in showy clusters, mostly white with some rose shading. Fruit rounded apple, scarlet, orange, red, yellow, blue, or nearly black.
Canada plum ( <i>Prunus nigra</i> )--	New England, west through northern tier of States to North Dakota.	Leaves broadly ovate, doubly toothed. Fruit red. (All species of <i>Prunus</i> have bitter taste or smell, flowers in clusters, and stone in fruit.)
Wild plum (hog or red plum)* ( <i>Prunus americana</i> ).-	Eastern United States and Rocky Mountain region to Utah and New Mexico. (See also p. 30.)	Leaves sharply toothed, wedge-shape at base, oval, 3 to 4 inches long. Fruit 1 inch diameter, bright red.
Wild plum ( <i>Prunus lanata</i> )-----	North and South Central States.	Leaves oval, hairy below. Plum with whitish bloom.
Wild goose plum ( <i>Prunus hortulana</i> ).-	Central States.	Leaves shiny, pointed. Fruit red or yellow.
Wild goose plum ( <i>Prunus munsonia</i> ).	Central Mississippi Valley, Oklahoma, and Texas.	Leaves long elliptical or lance-shape, thin, shiny. Fruit red, good quality. Fruit purplish red; ripens late summer.
Mexican plum ( <i>Prunus mexicana</i> ).	Kansas to Louisiana and Texas.	Native probably in Oklahoma and Texas. Now found widely distributed through South.
Chickasaw plum ( <i>Prunus angustifolia</i> ).-	Connecticut south (in mountains) to North Carolina.	Leaves broadly lance-shaped, thin, shiny, finely toothed. Fruit red or yellow, much used for food.
Allegheny sloe ( <i>Prunus alleghaniensis</i> ).	Southern States-----	Leaves long, pointed, finely toothed. Fruit purple, with bloom.
Black sloe ( <i>Prunus umbellata</i> )--	Cherokee County, Tex.-----	Leaves broadly ovate. Fruit, various colors.
(Texas sloe)* ( <i>Prunus tenuifolia</i> ).	Across northern United States, south in Appalachian Mountains. (See also p. 30.)	Leaves thin. Fruit oblong, with flat stone.
Pin cherry (bird or wild red cherry)* ( <i>Prunus pensylvanica</i> ).	Northeastern quarter of United States, south in Appalachian Mountains, west to northern Rockies.	Leaves long, pointed, finely toothed. Flowers in flat clusters (umbels). Cherry red, each on long stem. Spreads rapidly on burned-over forest lands.
Choke cherry ( <i>Prunus virginiana</i> ).	Georgia, range not well known.	Leaves broadly oval, sharp pointed, shiny. Flowers in long clusters (racemes). Cherry dark red.
(Georgia wild)* cherry ( <i>Prunus cuthbertii</i> ).	Eastern half of United States to the Great Plains.	Leaves smooth, firm, twigs hairy. Fruit red.
Black cherry ( <i>Prunus serotina</i> ).	Low mountains of central Alabama.	Leaves shiny, long pointed. Flowers in long clusters (racemes). Cherry black, pleasant flavor. Timber tree.
Alabama cherry ( <i>Prunus alabamensis</i> ).	Conecuh County, Southern Alabama.	Leaves broadly oval, thick, firm, up to 5 inches long. Fruit red or dark purple.
Cherry ( <i>Prunus australis</i> )-----	Conecuh County, Southern Alabama.	Leaves broadest near middle. Fruit purple.

Name of tree	Where the tree grows	Descriptive notes
Laurel cherry (mockorange)* ( <i>Prunus caroliniana</i> ).	South Atlantic and Gulf coastal region.	Leaves evergreen, thick, shiny, 2 to 4 inches long. Fruit black, shiny, holding over winter. Planted as ornamental tree.
West Indian cherry ( <i>Prunus myrtifolia</i> ).	Southern Florida (tropical)-----do-----do-----	Leaves pointed, firm, yellow-green above, 2 to 4 inches long. Fruit orange-brown.
Coco-plum ( <i>Chrysobalanus icaco</i> ). Florida catclaw ( <i>Pithecellobium unguis-cati</i> ).	Lower Rio Grande Valley of Texas. Gulf coast of Texas-----	Leaves broad, much rounded at end. Leaves of two pairs of leaflets, each rounded, thin. Pod 2 to 4 inches long.
Huajillo (Wa-hil-yo) ( <i>Pithecellobium brevifolium</i> ).	Lower Rio Grande Valley of Texas.	Leaves doubly compound of many leaflets. Pods straight, 4 to 6 inches long.
Texas ebony ( <i>Pithecellobium flexicule</i> ). Wild tamarind ( <i>Lysiloma bahamensis</i> ).	Gulf coast of Texas----- Southern Florida (tropical)-----	Leaves very small, twice compound, broad. Pod thick, 4 to 6 inches long. Leaves compound of many pairs of leaflets. Pod 1 inch broad, 4 to 5 inches long.
Huisache (acacia)* ( <i>Acacia farnesiana</i> ).	Western Texas-----	Leaves doubly compound, very small, bright green. Pods cylindrical. Flowers in round heads. Widely planted for its fragrant flowers.
Catclaw ( <i>Acacia tortuosa</i> )-----	Southwestern Texas-----	Leaves tiny, compound. Pod slender, beadlike.
Catclaw ( <i>Acacia wrightii</i> )----- Catclaw ( <i>Acacia emoriiana</i> )-----	Western Texas----- Southern Texas-----	Leaves compound, tiny, on long stems. Leaflets tiny. Pod much narrowed at base.
(Mimosa)* ( <i>Leucaena greggii</i> )-----	Western Texas-----	Leaves doubly compound. Pods narrow.
(Mimosa)* ( <i>Leucaena pulverulenta</i> ). (Mimosa)* ( <i>Leucaena retusa</i> )-----	Southern Texas (Gulf coast)----- Southern Texas and New Mexico. (See also p. 31.) Kansas to California and southward. (See also p. 31.)	Leaves doubly compound. Pods 8 inches long. Leaves featherlike compound of many leaflets.
Honey mesquite ( <i>Prosopis glandulosa</i> ).	Eastern United States (south and west of New York).-----	Leaves generally similar to above, 9 inches long, leaflets often 2 inches long.
Redbud ( <i>Cercis canadensis</i> )-----	Eastern United States-----	Leaves heart-shaped, thin. Flowers bright purplish red, in clusters. Pods pink, 2 to 3 inches long.
Texas redbud ( <i>Cercis reniformis</i> ). Coffeetree ( <i>Gymnocladus dioicus</i> )-----	Eastern Texas----- Central portion of Eastern United States.	Leaves kidney-shaped, firm, shiny. Leaves doubly compound, 2 to 3 feet long, of rounded pointed leaflets. Pods 8 inches long.
Honeylocust ( <i>Gleditsia triacanthos</i> ).	Central portion of eastern United States (extended widely by planting).	Leaves doubly compound of small elliptical leaflets. Pods 10 to 18 inches long, twisted, sweet pulp. Tree usually spiny.
Texas honeylocust ( <i>Gleditsia texana</i> ).	Central Mississippi Valley (Indiana to Texas).	Leaves compound of very small leaflets. Pods small, flattened, thin, straight. Tree spiny.
Waterlocust ( <i>Gleditsia aquatica</i> ).	Coastal region (South Carolina to Texas), Mississippi Valley.	Leaves single or doubly compound. Pods short, with 1 to 3 seeds. Tree spiny.
Border paloverde ( <i>Cercidium floridum</i> ).	Southern Texas (mouth of Rio Grande) (small tree).	Leaves tiny, twice compound. Bark bright green. Pods 2 inches long, pointed, straight.
Coralbean ( <i>Sophora affinis</i> )-----	Mississippi River to California. (See also p. 31.)	Leaves compound, 13 to 19 leaflets. Pods beaded.
Yellowwood ( <i>Cladrastis lutea</i> )-----	Southern Appalachian Mountains west to Arkansas.	Leaves of 7 to 11 rounded leaflets, 3 to 4 inches long. Pods small, pointed, in clusters. Wood, yellow.
Black locust (yellow locust)* ( <i>Robinia pseudacacia</i> ).	Appalachian Mountain region. Widely cultivated and naturalized over United States.	Leaves compound of 7 to 17 rounded leaflets. Flowers white, sweet scented. Pods 3 inches long with tiny seeds. Wood very durable.
Clammylocust ( <i>Robinia viscosa</i> ).	Southern Appalachian Mountains.	Leaves compound. Leafstalks sticky, hairy (clammy).
Jamaica dogwood ( <i>Ichthyomethia piscipula</i> ).	Southern Florida (tropical tree).	Leaves of 5 to 11 rounded leaflets, dropping early. Pods with 4 crinkly wings.
Lignumvitae ( <i>Guajacum sanctum</i> ). (Soapbush)* ( <i>Portiera angustifolia</i> ). (Name?) ( <i>Brysonima lucida</i> )-----	Southern Florida (tropical)----- Southern Texas----- Southern Florida (tropical)-----	Leaves of 6 to 8 leaflets. Pod tiny, orange. Leaves of 8 to 12 narrow leaflets. Flowers purple, sweet scented. Leaves opposite, wedge-shape, evergreen.
Hercules-club (prickly ash)* ( <i>Xanthoxylum clava-herculis</i> ).	South Atlantic and Gulf coastal regions, Arkansas, Oklahoma, Texas.	Leaves 5 to 8 inches long, of 6 to 18 pointed leaflets, on spiny stems. Fruit small in terminal clusters. This is not the Devil's-walking stick, see p. 22; sometimes called "Hercules club".

Name of tree	Where the tree grows	Descriptive notes
Wild lime tree ( <i>Xanthoxylum fagara</i> ). Satinwood ( <i>Xanthoxylum flavum</i> ). Hercules-club ( <i>Xanthoxylum coriaceum</i> ). Baretta ( <i>Heilieta parvifolia</i> ) Hoptree ( <i>Ptelea trifoliata</i> ). Torchwood ( <i>Amyris elemifera</i> ). Balsam torchwood ( <i>Amyris balsamifera</i> ). Paradise tree ( <i>Simarouba glauca</i> ). Bitterbush ( <i>Picramnia pentandra</i> ). (Name?) ( <i>Alvaradoa amorphoides</i> ). Bay cedar ( <i>Suriana maritima</i> ). Gumbo limbo ( <i>Bursera simaruba</i> ). Mahogany ( <i>Swietenia mahogani</i> ) Guiana plum ( <i>Drypetes lateriflora</i> ). Big Guiana plum ( <i>Drypetes diversifolia</i> ). Crabwood ( <i>Gymnanthes lucida</i> ). Manchineel ( <i>Hippomane mancinella</i> ). (Savia)* ( <i>Savia bahamensis</i> ). American smoketree, (chittamwood)* ( <i>Cotinus americanus</i> ). Poisonwood ( <i>Metopium toxiferum</i> ). Staghorn sumac ( <i>Rhus hirta</i> ). Dwarf sumac ( <i>Rhus copallina</i> ). Poison sumac ( <i>Rhus vernix</i> ). Texas pistache ( <i>Pistacia texana</i> ). Swamp ironwood, (leatherwood)* ( <i>Cyrilla racemiflora</i> ). Titi ( <i>Cliftonia monophylla</i> ). Holly ( <i>Ilex opaca</i> ). Dahoon ( <i>Ilex cassine</i> ). Krug's holly* ( <i>Ilex krugiana</i> ). Yaupon ( <i>Ilex vomitoria</i> ). Winterberry (Christmas berry)* ( <i>Ilex decidua</i> ). Mountain holly ( <i>Ilex montana</i> ). Eastern wahoo (burningbush)* ( <i>Euonymus atropurpureus</i> ). False boxwood ( <i>Gyminda latifolia</i> ). (Name?) ( <i>Rhacomia crossopetala</i> ).	Tropical parts of Florida and Texas. Southern Florida (tropical). do. Texas (along the Rio Grande). Eastern United States. Southern Rocky Mountain region. (See also p. 31.) Southern Florida (tropical). do. do. do. Coast of southern Florida (tropical). Southern Florida (tropical). Southern Florida (tropical) (nearly exterminated). Southern Florida (tropical). Florida Keys (tropical). Southern Florida (tropical). do. do. Kentucky to western Texas. Shores and hammocks of southern Florida (tropical). Northeastern United States, south in mountains. Eastern half of United States. Much of eastern United States. Southwestern Texas. Coast region, Virginia to Texas and somewhat inland. Coast, South Carolina to Louisiana. Southeastern United States, north along coast to Massachusetts. Coast, South Carolina to Louisiana. Southern Florida (tropical). Southeastern coast region, Virginia to Texas. Southeastern States, except in mountains. Tree size only in Great Smoky Mountains of North Carolina and Tennessee. Northeastern States westward, to Montana, south in central Mississippi River Basin. Southern Florida (tropical). do.	Leaves 3 to 4 inches long, of 7 to 9 rounded leaflets. Bark bitter, pungent. Leaves of 3 to 5 leaflets, evergreen. Leaves small, leathery, compound, without terminal leaflet, evergreen. Fruit in dense terminal cluster. Leaves opposite, small, mostly three-foliate. Leaves three-divided, alternate on stem. Seed enclosed in thin, papery, circular wing. Leaves usually opposite, of three leaflets. Fruit black. Leaves compound of 3 to 5 leaflets. Fruit with small hard seed. Leaves of 12 rounded leaflets. Stone fruit. Bark bitter, medicinal. Fruit fleshy. Tree with bitter juice. Fruit three-winged. Leaves fleshy, long, wedge-shaped. Flowers yellow. Large tree. Smooth bark. Leaves compound. Tree producing true mahogany wood. Leaves of 6 to 8 leaflets. Fruit hood-shaped. Leaves pointed and narrow. Fruit red, in small clusters. Leaves hold for 2 years, broadly elliptical, thick. Fruit white, 1 inch long. Fruit scarce, small, nearly black. Sap very poisonous. Apple-shaped fruit with a stone. Leaves evergreen. Flowers green, of two kinds. Leaves rounded, scarlet or orange in fall. Fruit on stalks with purple hairs. Bark exuding gum with caustic properties. Leaves compound, borne in terminal clusters. Leaves of 11 to 31 leaflets. Stems and branchlets velvety. Fruit red, dense head. Leaves of 9 to 21 leaflets. Leaf stalks winged. Fruit in open head. Leaves of 7 to 13 leaflets with scarlet midribs. Fruit white, in open clusters in leaf axils. Leaves compound. Flowers tiny, clustered. Leaves narrow, clustered near ends of branches. Fruit small in long slender clusters. Forming "titi" swamps. Leaves shiny. Fruit winged. Leaves evergreen, stiff, spiny. Flowers of 2 kinds on separate trees. Fruit (on female tree) red berry. Christmas evergreen. Leaves narrow, smooth on edges. Fruit small, red. Leaves oval, pointed. Fruit brownish purple. Leaves oblong-elliptical, coarsely toothed, thick, shiny, used for tea. Berries red. Leaves dropping in fall. Berries showy, orange or scarlet. Leaves dropping in fall, rounded at base, pointed, toothed, up to 5 inches long. Fruit, red berry. Leaves broad in middle, long pointed, toothed. Fruit 4-lobed, fleshy, purple. Leaves opposite, rounded, thick, finely toothed. Leaves alternate or opposite. Stone fruit.

Name of tree	Where the tree grows	Descriptive notes
Florida boxwood ( <i>Schaefferia frutescens</i> ). (Name?) ( <i>Maytenus phyllanthoides</i> ). Bladdernut ( <i>Staphylea trifolia</i> )	Southern Florida (tropical)--- do----- Great Lake States and south to Georgia and Oklahoma.	Leaves alternate, 2 inches long by 1 inch broad, narrow at base. Rounded fruit with stone. Leaves leathery. Fruit, 4-angled, red capsule. Leaves opposite, of 3 leaflets, 2 leaf bracts at base of stem. Fruit pod with bony seeds.
Mountain maple ( <i>Acer spicatum</i> ). Striped maple (moosewood)*--- ( <i>Acer pennsylvanicum</i> ). Sugar maple ( <i>Acer saccharum</i> )	Northeastern United States, south in mountains. Northeastern United States, south in mountains.	Leaves opposite, 8-lobed, coarsely toothed, red leaf stems. Flowers (racemes) and keys (fruit) in long clusters. Leaves opposite, drooping, rounded, 3-lobed at apex. Bark striped, greenish, smooth. Leaves opposite, pale and smooth below, 5-lobed, rounded sinuses. Keys ripen late (fig. 5, C). Tree yields sweet sap.
Black maple ( <i>Acer nigrum</i> )	Centers in region from Ohio to Iowa.	Leaves opposite, dull green (black), yellow downy below, thick, drooping.
Whitebark maple ( <i>Acer leucoderme</i> ). Southern sugar maple ( <i>Acer floridanum</i> ). Silver maple (white maple)* ( <i>Acer saccharinum</i> ). Red maple (soft maple)* ( <i>Acer rubrum</i> ). Boxelder (ashleaf maple)* ( <i>Acer negundo</i> ). Ohio buckeye ( <i>Aesculus glabra</i> )	Lower Appalachian Mountains to Arkansas and northern Louisiana. Southeastern Virginia to eastern Texas. Eastern United States, especially in central Mississippi Basin. Eastern United States----- Eastern half of United States, northern Rocky Mountain. (See also p. 31). Pennsylvania south and west to Missouri and Texas.	Leaves opposite, small, 3-lobed, light yellow-green, and densely downy beneath. Leaves opposite, with 3 rounded lobes, dark green, pale or fuzzy below, strongly veined. Leaves opposite, deeply lobed, toothed, silvery below. Flowers before leaves. Keys fall early. Leaves opposite, small, 3- or 5-lobed on red stems. Flowers red, opening before the leaves. Keys fall early. Leaves opposite, thin, mostly compound of 3, 5, or 7 leaflets. Greenish twigs. Leaves of 5 leaflets, on slender stems, opposite. Flowers yellow. Fruit with prickles. Leaves opposite, of 5 leaflets. Flowers red or yellow. No prickles on fruit.
Georgia buckeye ( <i>Aesculus neglecta lanceolata</i> ). Red buckeye ( <i>Aesculus pavia</i> )	North Carolina to western Florida. Southeastern United States---	Leaves opposite. Flowers red. No prickles on fruit.
Yellow buckeye ( <i>Aesculus octandra</i> ). Woolly buckeye ( <i>Aesculus discolor</i> ). Scarlet buckeye ( <i>Aesculus austrina</i> ). Wingleaf soapberry ( <i>Sapindus saponaria</i> ). Soapberry ( <i>Sapindus marginatus</i> ). Inkwood ( <i>Exothea paniculata</i> )	Pennsylvania to Illinois, south mostly in mountains. Georgia to Missouri and Texas. Southern-central United States. Southern Florida (tropical)--- Georgia, Florida----- Southern Florida (tropical)---	Leaves opposite, 5 to 7 leaflets, sharply toothed. Flowers yellow (rarely red). Fruit without prickles. Leaves woolly beneath, opposite. Flowers rose and yellow. Flowers scarlet. Leaves opposite. Leaves of 4 to 9 leaflets rounded at ends, brown leaf stem winged. 1-seeded, round fruit. Leaflets, 7 to 13. No wings on leaf stem. Fruit yellow. Leaves of 4 leaflets, each 4 to 5 inches long, dark green. Fruit, 1-sided, dark orange. 3 leaflets, 1 to 2 inches long, rounded at ends. Round fruit with round stone.
White ironwood ( <i>Hypelate trifoliata</i> ). (Name?) ( <i>Cupania glabra</i> )--- (Varnish leaf)* ( <i>Dodonaea microcarpa</i> ). Bluewood ( <i>Condalia obovata</i> ). Red ironwood ( <i>Reynosia septentrionalis</i> ). Black ironwood ( <i>Krugiodendron ferreum</i> ). Yellow buckthorn ( <i>Rhamnus caroliniana</i> ). Soldierwood ( <i>Colubrina reptinata</i> ). Nakedwood ( <i>Colubrina cubensis</i> ). Nakedwood ( <i>Colubrina arborescens</i> ). (Smooth)* basswood ( <i>Tilia glabra</i> )	Florida Keys----- Southern Florida (tropical)--- Long Pine Key, Fla. (tropical)--- Western Texas----- Southern Florida (tropical)--- do----- Southeastern United States---- Southern Florida (tropical)--- do----- Maine to Michigan and south to Ohio River, west to Nebraska.	Leaves wedge-shape, sticky. Fruit a capsule. Branches spine-tipped. Leaves small. Leaves opposite, thick, dark green, notched end. Dark, edible purple "plum." Leaves bright green, shiny, opposite, persistent, 1 inch across. Fruit round, black, 1 seed. Leaves elliptical, slightly toothed, dark yellow-green, strongly veined. Round, black fruit. Leaves thin, smooth, yellow-green, 2 to 3 inches long. Fruit 3-lobed, red-orange. Smooth trunk. Leaves thick, dull green, densely fuzzy. Leaves thick and leathery, reddish, fuzzy beneath. Leaves coarsely toothed, smooth except tufts of hairs on upper surface. Flower stalks smooth.

<sup>1</sup> An unusual case of a varietal name only.

Name of tree	Where the tree grows	Descriptive notes
Basswood ( <i>Tilia porracea</i> ) (White-fruited) basswood ( <i>Tilia leucocarpa</i> ).	Western Florida..... Alabama to Arkansas and Texas.	Leaves fuzzy below, oblique at base. Leaves coarsely toothed, not hairy tufted. Flower stalk densely hairy.
Basswood ( <i>Tilia venulosa</i> )	Southwestern North Carolina.	Branchlets bright red and stout.
Basswood ( <i>Tilia littoralis</i> )	Southeastern Georgia.....	Leaves finely toothed. Branchlets slender.
Basswood ( <i>Tilia crenoserrata</i> )	Southwestern Georgia and Florida.	Leaves roundedly toothed, smooth on lower surface.
Basswood ( <i>Tilia australis</i> ) (Southern)* basswood ( <i>Tilia floridana</i> ).	Northeastern Alabama..... North Carolina south and west to Oklahoma and Texas.	Leaves smooth below, thin. Leaves thin, coarsely toothed. Summer twigs not pubescent.
Basswood ( <i>Tilia cocksi</i> )	Southwestern Louisiana.....	Leaves blue-green, shiny below in early summer.
(Hairy)* basswood ( <i>Tilia neglecta</i> ).	New England south, in mountains to Mississippi, west to Missouri.	Leaves with short fine hairs on lower surface.
(Carolina)* basswood ( <i>Tilia caroliniana</i> ).	North Carolina, Georgia, and west to Texas.	Leaves square at base, sparsely hairy below, smooth above. Branchlets smooth.
(Texas)* basswood ( <i>Tilia Texana</i> ).	Southeastern Texas.....	Leaves, heart-shaped base. Branchlets smooth.
Basswood ( <i>Tilia phanera</i> )	South-central Texas.....	Leaves rounded, deeply heart-shaped at base.
Basswood ( <i>Tilia eburnea</i> )	Western North Carolina to Florida.	Leaves obliquely squared at base. Branchlets hairy.
Basswood ( <i>Tilia lata</i> )	Northwestern Alabama.....	Leaves oval, long-pointed, heart-shaped at base. Branchlets reddish.
White basswood ( <i>Tilia heterophylla</i> ).	Pennsylvania to Missouri and south into Gulf States.	Leaves densely woolly below, squared or heart-shape at base. Branchlets slender.
White basswood ( <i>Tilia monticola</i> ).	Appalachian Mountains (meeting of Virginia, North Carolina, and Tennessee).	Leaves white, woolly below, squared at base. Branchlets stout.
(Georgia)* basswood ( <i>Tilia georgiana</i> ).	South Carolina to Florida, Arkansas.	Leaves pale, woolly below. Branchlets fine, hairy. Winter buds hairy.
Loblolly-bay ( <i>Gordonia lasianthus</i> ).	South Atlantic and Gulf coastal region.	Leaves thick, shiny, smooth, 4 to 5 inches long, narrow at base, persistent on branch. Related to the tea plant of Asia.
Franklinia ( <i>Franklinia alatamaha</i> ).	Altamaha River, Ga. (originally), but now known only in cultivation.	Leaves 5 inches long, oblong, narrowed at base, shiny. Flowers showy white, 3 inches across. Planted for ornament.
Cinnamon bark ( <i>Canella winterana</i> ).	Southern Florida (tropical)....	Leaves elliptical, rounded at ends, thick, shiny. Inner bark, the cinnamon of commerce.
Popaya ( <i>Clarica papaya</i> )	Eastern coast of southern Florida (tropical).	Leaves very large, much lobed; 3 to 5 inches long, edible. Cultivated for fruit.
Tree cactus* ( <i>Cephalocereus deeringii</i> ).	Southern Florida (tropical)....	No leaves. Branches usually 10-ribbed, spiny. Flowers inconspicuous, dark red.
Mangrove ( <i>Rhizophora mangle</i> )	Coast of lower Florida peninsula (tropical).	Leaves opposite, thick, evergreen, elliptical, 4 inches long. Fruit, a berry germinating on the tree.
Surgeon stopper ( <i>Eugenia buxifolia</i> ).	Southern Florida (tropical)....	Leaves opposite, rounded at end, thick, 1 inch long. Flower clusters (racemes) in leaf axil.
White stopper ( <i>Eugenia axillaris</i> ).	East coast of Florida (tropical).	Leaves opposite, 2 inches long, narrow, blunt pointed.
Red stopper ( <i>Eugenia rhombea</i> )	Florida Keys (tropical).....	Leaves opposite. Flowers in bunches (fascicles).
Red stopper ( <i>Eugenia confusa</i> )	Southern Florida (tropical)....	Leaves opposite, long pointed. Flowers as above.
Naked stopper ( <i>Eugenia diocrana</i> ).	do.....	Leaves opposite. Flowers 3-flowered, open clusters.
Stopper ( <i>Eugenia simpsonii</i> )	do.....	Leaves larger than above. Doubly 3-flowered.
Stopper ( <i>Eugenia longipes</i> )	do.....	Leaves opposite, evergreen. Flowers white, fragrant.
Stopper ( <i>Eugenia bahamensis</i> )	do.....	Leaves rounded. Fruit black. Flowers sweet.
White spicewood ( <i>Calyptrotheces pallens</i> ).	do.....	Leaves opposite, long pointed, 2 to 3 inches long. Flowers minute, in compound clusters (panicles).
Spicewood ( <i>Calyptrotheces zuzygium</i> ).	do.....	Leaves opposite, elliptical, rounded; branchlets smooth. Flowers small, in sparse clusters (cymes).
(Name ?) ( <i>Tetrazygia bicolor</i> )	do.....	Leaves opposite. Flowers showy, white.
Black olive tree ( <i>Bucida buceras</i> )	do.....	Leaves in whorls, 2 to 3 inches long, rounded at ends. Flowers in spikes.
Buttonwood ( <i>Conocarpus erecta</i> )	do.....	Flowers in heads. Fruit in cones.

Name of tree	Where the tree grows	Descriptive notes
White buttonwood ( <i>Laguncularia racemosa</i> ).	Southern Florida (tropical)---	Leaves opposite, short, rounded, thick, leathery. Flowers minute, borne on hairy clusters (spikes).
Devil's walking stick (Hercules club)* ( <i>Aralia spinosa</i> ).	Most of eastern half of United States.	Spiny, aromatic tree or shrub. Leaves doubly compound, 3 to 4 feet long at end of branches.
Black gum (sour gum)* ( <i>Nyssa sylvatica</i> ).	-----do-----	Leaves oblong, broadest above the middle, thick. Fruit small, stone slightly marked (ribbed).
Swamp black gum ( <i>Nyssa biflora</i> ).	Coastal acid swamps, Maryland to Texas.	Leaves narrower than those of black gum (1 inch wide). Fruit small, stone prominently marked (ribbed) (fig. 3, F).
Sour tupelo gum ( <i>Nyssa ogeche</i> ).	Coastal region South Carolina to Florida (not abundant).	Fruit red (plum), large (1 inch long), single. Leaves 4 to 6 inches long.
Tupelo gum ( <i>Nyssa aquatica</i> )--	Coastal fresh water or "deep" swamps, Virginia to Texas, up Mississippi River. Not found in stagnant swamps.	Fruit large (1 inch), purple (plum), single on long stem. Leaves broadly elliptical, 5 to 7 inches long (fig. 3, G)
Dogwood (flowering dogwood)* ( <i>Cornus florida</i> ).	Eastern half of United States..	Leaves opposite, oval, pointed. Flowers small, in dense head with showy white bracts. Fruit red.
Blue dogwood ( <i>Cornus alternifolia</i> ).	Northeastern States and Appalachian Mountains.	Leaves alternate (otherwise similar to <i>Cornus florida</i> ). Flowers small, without showy scales.
Roughleaf dogwood ( <i>Cornus asperifolia</i> ).	Eastern United States-----	Leaves opposite. Flowers in loose heads, not showy. Fruit white.
(Name?) ( <i>Elliottia racemosa</i> )--	Southeastern Georgia-----	Flowers with 4 petals, in long clusters.
Great rhododendron ( <i>Rhododendron maximum</i> ).	New England, Ohio, south in the Appalachian Mountains.	Leaves thick, evergreen, 4 to 12 inches long, clustered at ends of branches. Flowers showy in large clusters.
Catawba rhododendron ( <i>Rhododendron catawbiense</i> ).	Appalachian Mountains, Virginia south to Georgia and Alabama.	Leaves 4 to 6 inches long, broad, thick. Calyx lobes of flowers sharp pointed.
Mountain-laurel ( <i>Kalmia latifolia</i> ).	New England to Indiana and south to Gulf.	Leaves elliptical, thick, evergreen, 3 inches long. Flowers in clusters (corymbs), showy.
Sourwood ( <i>Orydendrum arboreum</i> ).	Appalachian Mountains, west to Louisiana.	Leaves elliptical, finely toothed. Flowers bell-shaped in long compound clusters (panicles).
(Name?) ( <i>Lyonia ferruginea</i> )--	South Atlantic coast-----	Flower clusters in leaf axils.
Tree huckleberry ( <i>Vaccinium arboreum</i> ).	Coast, Virginia to Texas, northward in Mississippi River Basin.	Leaves elliptical, thin, 2 inches long. Flowers in open clusters (racemes).
Marlberry ( <i>Iacocrea paniculata</i> ).	Southern Florida (tropical)---	Leaves thick with numerous resin dots. Blackberries in clusters.
(Name?) ( <i>Rapanea guianensis</i> )--	-----do-----	Leaves oblong. Fruit round.
Joewood ( <i>Jaquinia keyensis</i> ).	-----do-----	Leaves sometimes opposite. Flower terminal.
Satinleaf ( <i>Chrysophyllum oliviforme</i> ).	-----do-----	Leaves soft, hairy below, 2 to 3 inches long. Fruit oval, fleshy, purple.
Mastic ( <i>Sideroxylon foetidissimum</i> ).	-----do-----	Leaves elliptical, thin. Flowers minute.
Bustic ( <i>Dipholis salicifolia</i> ).	-----do-----	Leaves narrow, shiny. Flowers minute.
Tough buckthorn ( <i>Bumelia tenax</i> ).	South Atlantic coast, southwestern Georgia.	Leaves thin, oblong, silky below. Fruit round, sweet, edible.
Gum elastic ( <i>Bumelia lanuginosa</i> ).	Coastal region Georgia to Texas, Mississippi Basin.	Leaves with soft brown hairs curved backward. Fruit oblong, in leaf axils.
Buckthorn ( <i>Bumelia monticola</i> ).	Southern and western Texas..	Leaves thick, shiny. Branchlets often ending in stout spines.
Buckthorn ( <i>Bumelia lycoides</i> )--	Southeastern States-----	Leaves thin, oblong. Fruit oblong, fleshy.
Saffron plum ( <i>Bumelia angustifolia</i> ).	Southern Florida (tropical)---	Leaves leathery, 1 inch long, evergreen. Fruit small with sweet flesh.
Wild dilly ( <i>Mimusops parvifolia</i> ).	Florida Keys (tropical)-----	Leaves clustered at branch ends, notched.
Persimmon ( <i>Diospyros virginiana</i> ).	Eastern United States, except northern portion.	Leaves oval (widest below middle), firm. Fruit fleshy, edible, stone seed (fig. 4, I). Close relative of Ebony tree of the Tropics.
Black persimmon ( <i>Diospyros texana</i> ).	Southern and southwestern Texas.	Leaves rounded at end, narrow at base, 1 inch long. Fruit black.
Sweetleaf ( <i>Symplocos tinctoria</i> ).	Delaware to Florida, west to Arkansas and Texas.	Leaves pointed, good for browse. Fruit small, in close clusters.
Silverbell, (Lily-of-the-valley tree)* ( <i>Halesia carolina</i> ).	Southern Appalachian Mountain region.	Flowers about $\frac{1}{2}$ inch long, in small clusters (fascicles). Fruit 4-winged.
Mountain silverbell ( <i>Halesia monticola</i> ).	Southern Appalachian Mountains, west to Oklahoma.	Leaves elliptical (fig. 4, C). Fruit as above. Flowers 2 inches long in fascicles. Leaves 8 to 11 inches long.
Little silverbell ( <i>Halesia parviflora</i> ).	Southern Georgia, northern Florida, Alabama.	Fruit club-shaped, 1 inch long. Flowers minute, in fascicles. Leaves 3 inches long.

Name of tree	Where the tree grows	Descriptive notes
Two-wing silverbell ( <i>Halesia diptera</i> ). Snowbell ( <i>Styrax grandifolia</i> )-----	Coastal plain of Georgia west to eastern Texas. South Atlantic and Gulf coast region.	Fruit 2-winged. Flowers in clusters (racemes). Leaves 3 to 5 inches long. Leaves broadly oval, 2 to 5 inches long. Flowers white, in terminal clusters (racemes).
Blue ash ( <i>Fraxinus quadrangulata</i> ). Black ash ( <i>Fraxinus nigra</i> )-----	Michigan to Iowa, south to Tennessee and Oklahoma.	Branchlets square; leaves opposite, o f 5 to 11 leaflets on short stems. Flowers without calyx, perfect.
Water ash ( <i>Fraxinus caroliniana</i> ) (Gulf)* water ash ( <i>Fraxinus pauciflora</i> ). White ash ( <i>Fraxinus americana</i> )-----	Northeastern United States. (Cold swamps, along streams and lakes). South Atlantic and Gulf coast region. Deep swamps and river bottoms. Southern Georgia, Florida. Deep swamps and river bottoms. Eastern half of United States.	Leaves opposite, of 7 to 11 leaflets without stem s (sessile). Branchlets round. Flowers without calyx, polygamous. Leaves opposite, leaflets 5 or 7 on stems. Flowers with calyx, 2 kinds on separate trees. Fruit often 3-winged. Leaves opposite, leaflets 3 or 5, more pointed than above. Flowers like above. Fruit 2-winged. Leaves opposite, of 5 to 9 leaflets each, broadly oval, usually smooth and whitish below (fig. 5, B). Flowers of 2 kinds on separate trees. Important timber tree.
Biltmore white ash ( <i>Fraxinus biltmoreana</i> ). Texas ash ( <i>Fraxinus texensis</i> )----- Mexican ash ( <i>Fraxinus berlandieri</i> ana). Red ash ( <i>Fraxinus pennsylvanica</i> ). Green ash ( <i>Fraxinus pennsylvanica lanceolata</i> ). Pumpkin ash ( <i>Fraxinus profunda</i> ). Swamp privet ( <i>Forestiera acuminata</i> ). Fringetree ( <i>Chionanthus virginicus</i> ). Devilwood ( <i>Osmanthus americanus</i> ). (Florida)* devilwood ( <i>Osmanthus floridana</i> ). Geiger-tree ( <i>Cordia sebestena</i> ). Strongback ( <i>Bourreria ovata</i> ). Anaqua ( <i>Ehretia elliptica</i> ). Fiddlewood ( <i>Citharexylon fruiticosum</i> ). Blackwood ( <i>Avicennia nitida</i> ). Potato tree ( <i>Solanum verbasco-folium</i> ). Common catalpa ( <i>Catalpa bigonoides</i> ). Hardy catalpa ( <i>Catalpa speciosa</i> ). Black calabash-tree ( <i>Enallagma cucurbitina</i> ). Fever tree ( <i>Pinckneya pubens</i> ). Princewood ( <i>Exostema caribaeum</i> ).	Central portion of eastern United States. Texas, except southern portion. Western Texas----- Most of the eastern United States. (See variety below.) Eastern United States; west in the Rocky Mountains. (Important variety of the above species.) (See also p. 32.) Scattered, mostly east of the Mississippi River. Central portion of eastern half of United States. Pennsylvania south to Florida and west to Texas. South Atlantic and Gulf coasts. Southern Florida----- Southern Florida (tropical)----- do----- Southern and western Texas----- Southern Florida (tropical)----- Gulf coast to Louisiana----- Southern Florida (tropical)----- Central portion of Southern States. Central Mississippi River Basin. Widely planted for its straight trunk. Southern Florida (tropical)----- South Atlantic coast (rare)----- Southern Florida (tropical)-----	Leaves and branchlets fuzzy, 7 to 9 leaflets, whitish below. Leaves opposite. Wing of fruit mostly terminal. Leaves opposite, mostly of 5 rounded leaflets. Leaves opposite, of 3 or 5 long, narrow leaflets. Wing extending halfway on fruit body. Leaves opposite, of 7 or 9 tapering, long-stemmed leaflets, slightly fuzzy (also branchlets), green below. Wing extending part way up the fruit body. Flowers (2 kinds) on separate trees. Important timber tree. Same as above except smooth leaflets and branchlets. Very difficult to distinguish from red ash. A very common ash. Important timber tree. Leaves large, opposite, of mostly 7 leaflets, soft fuzzy below and on stem. Leaves opposite, elliptical, 2 to 4 inches long. Flowers without petals, small. Leaves opposite, thick, smooth, oblong. Flowers of 4 drooping white petals. Resembling fringetree, except flowers small, tube shaped, and leaves evergreen. Differs from <i>Osmanthus americanus</i> in hairy flower clusters and larger yellow-green fruit. Leaves 5 inches long. Flowers orange color. Leaves oval. Flowers white. Fruit orange-red. Leaves oblong, downy below. Flowers tiny. Leaves opposite, 3 to 4 inches long, narrow. Flowers in long cluster. Leaves opposite, leathery, evergreen, 6 inches long. Leaves rank smelling, oval, 5 to 7 inches long. Small flowers. Yellow berries. Leaves opposite, broadly heart-shape, 4 to 6 inches long. Flowers in crowded clusters. Pods slender, thin-walled. Leaves opposite, longer pointed than those of common catalpa. Flowers in few-flowered clusters. Pods thick-walled, relatively large in diameter. Leaves 6 to 8 inches long, thick, shiny. Fruit fleshy. Leaves opposite. Fruit 2-celled capsule. Flowers long, tubular. Heavy, hand some wood.

Name of tree	Where the tree grows	Descriptive notes
Buttonbush ( <i>Cephalanthus occidentalis</i> ).	Eastern United States, across southern New Mexico and Arizona to California. (See also p. 32.)	Broadly elliptical leaves, opposite, on stout stems. Flowers in round heads or balls.
Seven-year apple ( <i>Genipa clusiifolia</i> ). (Name?) ( <i>Hamelia patens</i> )	Southern Florida (tropical)----- do ----- do ----- do -----	Leaves bunched near ends of branches. Flowers small, white, clustered. Dry pulpy. Leaves opposite.
Velvetseed ( <i>Guettarda elliptica</i> ). Roughleaf velvetseed ( <i>Guettarda scabra</i> ).	Northeastern Florida----- Southern Florida (tropical)-----	Leaves opposite, broadly oval, thin. Leaves opposite, leathery, stiff, hairy and harsh to touch.
Balsamo ( <i>Psychotria nervosa</i> ). (Name?) ( <i>Psychotria undata</i> )	Florida elder ( <i>Sambucus simpsonii</i> ). Nannyberry ( <i>Viburnum lentago</i> ).	Leaves opposite, oval to lance-shape. Leaves opposite, thin, elliptical. Fruit bright red.
Blackhaw ( <i>Viburnum prunifolium</i> ).	Eastern Florida-----	Leaves opposite, of 5 leaflets. Shiny black berries in clusters (cymes). Leaves opposite, on winged leaf stems. Winter buds long pointed.
Rusty blackhaw ( <i>Viburnum rufidulum</i> ).	Northeastern United States west into northern Rocky Mountains. (See also p. 32.)	Leaves opposite, smooth leaf stems, flowers on short stalks. Winter buds blunt pointed.
(Name?) ( <i>Viburnum obovatum</i> ). Groundsel tree ( <i>Baccharis halimifolia</i> ).	Connecticut to Georgia, narrowing belt to Kansas.	Leaves opposite. Winter buds and stems of early leaves reddish, fuzzy.
(Groundsel tree)* ( <i>Baccharis glomeruliflora</i> ).	Virginia to Florida west to Kansas, Oklahoma and Texas.	Leaves thick, shiny. Flowers white. Leaves broadly wedge-shape, resinous. Flowers on female (pistillate) tree showy white.
	Central Atlantic States----- Atlantic and Gulf coasts (salty flats and marshes).	Flowers and fruit in much crowded clusters. Leaves not resinous.
	Coast region. North Carolina to Florida.	

## WESTERN FOREST TREES

The western division of trees of the United States, including the Rocky Mountain and Pacific coast forest regions (fig 7), has a total of 227 native tree species, representing 76 genera, 33 families, and the 2 broad classes which embrace all trees.<sup>12</sup> Popularly the different species are distributed as follows: 62 conifers, 2 yews (tumion), 1 palm, 5 yuccas, 4 cacti, 3 hawthorns, and 150 species of willows, alders, poplars or cottonwoods, oaks, legumes (mesquites, beans, locusts, etc.), myrtles, and other hardwoods or broadleaf trees.

Seventeen of the above 227 tree species grow also in the eastern division of trees and, therefore, are described under both regions. These include the white spruce, dwarf juniper, aspen, balsam poplar (Balm-of-Gilead), peachleaf and Bebbs willows, paper birch, coral-bean, and buttonbush, which extend across the United States, and the wild plum, pin cherry, honey mesquite, hoptree, leucaena, boxelder, red or green ash, and nannyberry which extend westward into the Rocky Mountains.

An asterisk (\*) after a common name indicates that it is used, but is not officially approved by the Forest Service.

Name of tree	Where the tree grows	Descriptive notes
Western white pine ( <i>Pinus monticola</i> ).	Washington, Oregon, Idaho, western Montana, south in Sierra Nevada Mountains in California.	Leaves 5 in cluster, blue-green, 2 to 4 inches long. Cone slender, 5 to 11 inches long (fig. 6, C). Important timber tree.
Sugar pine ( <i>Pinus lambertiana</i> ).	Western Oregon, in mountains of California nearly to Mexico.	Leaves 5 in cluster, 3 to 4 inches long. Cone 10 to 20 inches long (fig. 6, E). Important timber tree.
Limber pine ( <i>Pinus flexilis</i> ).	Rocky Mountains, Canada to Mexico. Sierra Nevada Mountains of California.	Leaves 5 in cluster, 2 to 3 inches long. Cone stout, from 3 to 9 inches long.

<sup>12</sup> Gymnosperms and angiosperms.

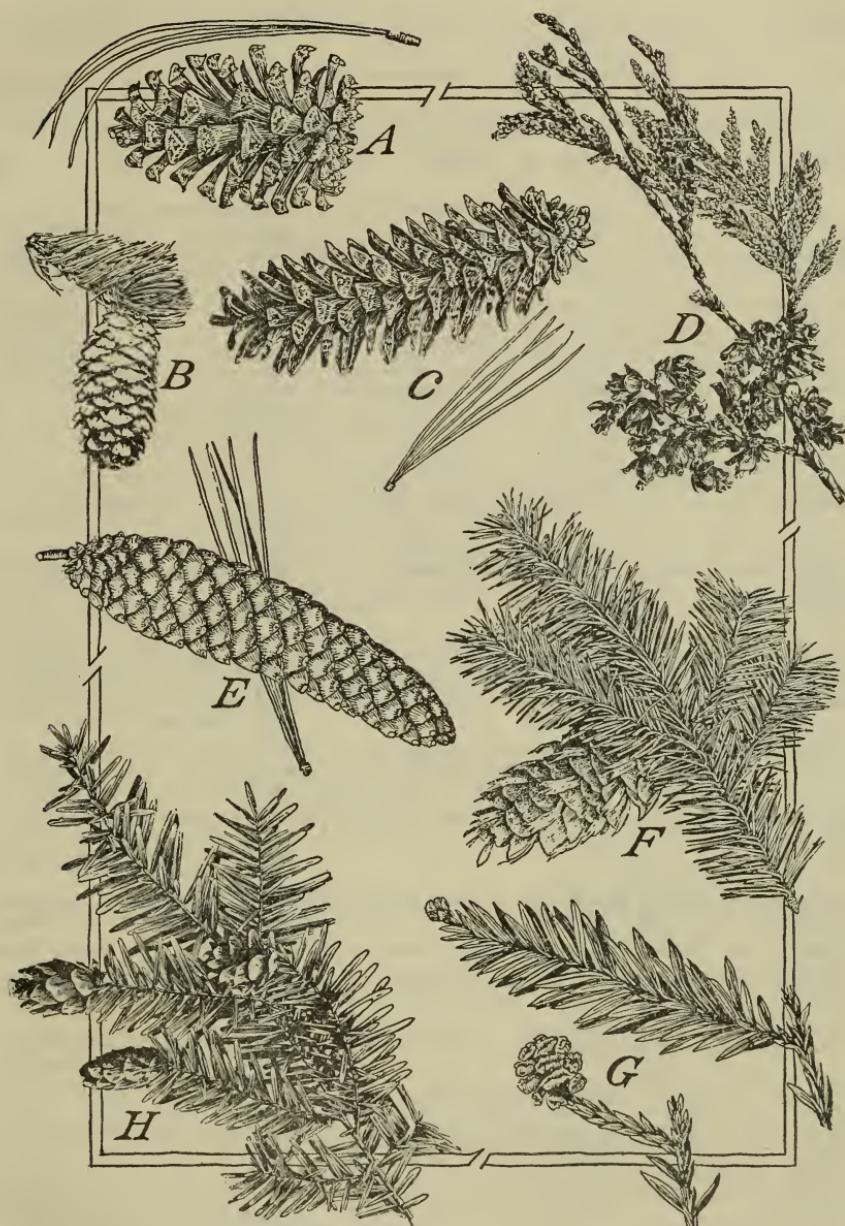


FIGURE 6.—Cones and leaves of important timber trees of the western part of the United States: A, Ponderosa pine (p. 26); B, Englemann spruce (p. 26); C, western white pine (p. 24); D, western red cedar (p. 27); E, sugar pine (p. 24); F, Douglas fir (p. 27); G, coast redwood (p. 27); H, western hemlock (p. 27). (See also pp. 43 and 45.)

Name of tree	Where the tree grows	Descriptive notes
Whitebark pine ( <i>Pinus albicaulis</i> ).	Northern Rocky Mountains, eastern Washington to California.	Bark usually thin. Leaves 5 in cluster 1 to 3 inches long, persisting for 5 to 8 years. Small tree.
Mexican white pine ( <i>Pinus strobusiformis</i> ).	Western Texas to southeastern Arizona.	Leaves 5 in cluster, slender, 4 to 6 inches long. Cone scales turning backward.
Parry pinon ( <i>Pinus parryana</i> ).	Southern California.	Leaves usually 4 in cluster. Cone small, irregular. Small tree.
Mexican pinon ( <i>Pinus cembroides</i> ).	Central and southern Arizona, western Texas.	Leaves 2 or 3 in cluster, 1 to 2 inches long. Cone much like above. Small tree.
Pinon (nut pine)* ( <i>Pinus edulis</i> ).	Dry foothills of southern Rocky Mountain region, Utah to California.	Leaves mostly 2 in cluster, 1 to 2 inches long. Cone 1 to 2 inches long. Seeds large, edible.
Singleleaf pinon ( <i>Pinus monophylla</i> ).	Utah, northern Arizona, central and southern California.	Leaves occurring singly (occasionally 2), 1 to 2 inches long. Cone irregular. Seeds edible. Sprawling tree.
Foxtail pine ( <i>Pinus balfouriana</i> ).	High mountains of northern and central California.	Leaves in fives, thick, stiff, dark green, 1 inch long. Cone with thick scales.
Bristlecone pine ( <i>Pinus aristata</i> ).	High southern Rocky Mountains, Utah to southern California.	Leaves in fives, 1 to 2 inches long. Cone with long slender prickles.
Torre pine ( <i>Pinus torreyana</i> ).	San Diego County and Santa Rosa Island, Calif. Range very limited.	Leaves in fives, clustered at ends of branches, 9 to 12 inches long. Cone with thick scales.
Arizona pine ( <i>Pinus arizonica</i> ).	Southern parts of New Mexico and Arizona.	Leaves in threes to fives, stout, 5 to 7 inches long. Cone about 2 inches long.
Ponderosa pine (western yellow pine)* ( <i>Pinus ponderosa</i> ).	Mountains of western United States. Often forms extensive pure stands in southern Rockies.	Leaves in clusters of 3, tufted, 5 to 10 inches long. Cone on short stem (if any), 3 to 6 inches long, with prickles (fig. 6, A). Important timber tree.
Apache pine ( <i>Arizona longleaf pine</i> )* ( <i>Pinus apachea</i> ).	Central and southwestern New Mexico, southern Arizona.	Leaves very long (8 to 15 inches), dark green, stout. Cone one-sided.
Jeffrey pine ( <i>Pinus jeffreyi</i> ).	Southern Oregon south through California.	Leaves 5 to 9 inches long, in threes, stiff. Cone 6 to 15 inches long, with large seeds.
Chihuahua pine ( <i>Pinus leiophylla</i> ).	Mountains of Arizona, southwestern New Mexico.	Leaves in threes, slender, gray-green. Cone small, ripening in 3 years.
Lodgepole pine ( <i>Pinus contorta</i> ).	Mountains of western United States; most abundant in northern Rockies.	Leaves in twos, 1 to 3 inches long. Cone remaining closed for several years. Tree used for cross ties and poles.
Digger pine ( <i>Pinus sabiniana</i> ).	Foothills of Sierra Nevada Mountains in central California.	Leaves in threes, blue-green, drooping, 8 to 12 inches long. Cone large, sharp, spiny, with edible seeds or nuts.
Coulter pine ( <i>Pinus coulteri</i> ).	Mountains of southern California (scattering).	Leaves in threes, thick, dark blue-green, 7 to 10 inches long. Cone is largest of all native pines, 10 to 14 inches long, with strong curved spines.
Monterey pine ( <i>Pinus radiata</i> ).	Narrow strip of coast in central California.	Leaves mostly in threes. Cone often remaining closed on trees for many years.
Knob-cone pine ( <i>Pinus attenuata</i> ).	Dry mountain slopes, Oregon and California.	Leaves pale green, 3 in bundle. Cone 1-sided at the base.
Bishop pine ( <i>Pinus muricata</i> ).	Coast mountains of California.	Leaves in twos, 3 to 5 inches long. Cone spiny, often staying closed for years.
Western larch ( <i>Larix occidentalis</i> ).	Mountains of northwestern United States.	Leaves 1 inch long, closely crowded, falling in winter. Cone with bracts extending beyond scales. Important for timber and cross ties.
Alpine larch ( <i>Larix lyallii</i> ).	High northern Rocky Mountains.	Resembling above except leaves 4-angled.
White spruce ( <i>Picea glauca</i> ). The common western variety is <i>Albertiana</i> .	Northern Rocky Mountain region, including the Black Hills (S. Dak.) and Washington, Alaska. (See also p. 6.)	Leaves 4-sided, pale blue-green, sharp. Cone scale rounded.
Engelmann spruce ( <i>Picea engelmannii</i> ).	Extensive over Rocky Mountain region; Washington and Oregon.	Leaves 4-sided, 1 inch long. Cone brown, shiny, with thin notched scales (fig. 6, B). Pulpwood and timber tree.
Blue spruce ( <i>Picea pungens</i> ).	Central Rocky Mountains.	Leaves stiff, sharp-pointed, curved, blue-green.
Sitka spruce ( <i>Picea sitchensis</i> ).	Coast region of northern California to Washington, Alaska.	Leaves flattened, sharp. Cone with scales notched toward ends. Important timber tree.
Weeping spruce ( <i>Picea breweriana</i> ).	High mountains near timber line extreme northern California and southwestern Oregon.	Leaves flattened, blunt. Branchlets hairy, light brown.

Name of tree	Where the tree grows	Descriptive notes
Western hemlock ( <i>Tsuga heterophylla</i> ).	Pacific coast and northern Rocky Mountains.	Leaves flat, blunt, shiny, twisted on branch to form two rows. Cone 1 inch long, without stem (fig. 6, H). Important timber tree.
Mountain hemlock ( <i>Tsuga mertensiana</i> ). Douglas fir ( <i>Pseudotsuga taxifolia</i> ).	High altitudes northwestern United States. Western United States (except Nevada). Largest size and most abundant in coast forests of western Washington and Oregon.	Leaves rounded or grooved above, curved. Cone with short bracts. Leaves straight, flat, rounded near end, soft, flexible, about 1 inch long. Cone 2 to 4 inches long with bracts extended between the scales (fig. 6, F). Up to 380 feet in height. Important timber tree.
Bigcone spruce ( <i>Pseudotsuga macrocarpa</i> ). Alpine fir ( <i>Abies lasiocarpa</i> ).	Mountain slopes of southern California. High Rocky Mountains; west into Oregon and Washington. Alaska.	Resembling the above, but cone 4 to 6 inches long. Leaves flat and grooved above, pale green, 1 inch long. Cone purple. Bark hard. Note that cones on all true firs stand erect on branches.
Corkbark fir ( <i>Abies arizonica</i> ). Lowland white fir ( <i>Abies grandis</i> ). White fir ( <i>Abies concolor</i> ).	Highest mountain tops of Arizona and New Mexico. Northern Rocky Mountains, coast forest south to California. Central and southern Rockies, southwestern Oregon to southern California. Of all firs, it grows in warmest and driest climate.	Bark soft corky, ashy white. Leaves and cones resembling above. Leaves flat, dark green, shiny above. Cone green. Pulpwood tree. Same as above, except leaves pale blue-green or whitish, and often 2 to 3 inches long. Cone 3 to 4 inches long, purple. Pulpwood tree.
Silver fir ( <i>Abies amabilis</i> ).	Coast forest of Washington and Oregon, Cascade Mountains.	Leaves flat, dark green, shiny, pointing forward on sterile branches. Cone deep purple, with broad scales. Pulpwood tree.
Noble fir ( <i>Abies nobilis</i> )...	Coast mountains, Washington to California; Cascade Mountains of Washington and Oregon.	Leaves often 4-sided, blue-green, smooth. Cone purple, bracts much longer than cone scales, green. Pulpwood tree.
California red fir ( <i>Abies magnifica</i> ).	Sierra Nevada Mountains of California, Cascade Mountains of southern Oregon.	Leaves on sterile branches, 4-sided. Cone purplish brown, slender tips of bracts same length as scales. Pulpwood tree.
Bristlecone fir ( <i>Abies venusta</i> ). Sierra redwood,* or big tree ( <i>Sequoia washingtoniana</i> ), ( <i>S. gigantea</i> )*.	Santa Lucia Mountains, Monterey County, Calif. Western slopes of Sierra Nevada Mountains in central eastern California.	Cone bracts many times longer than cone scales. Leaves tiny, scalelike. Cone 2 to 3 inches long, much larger than those of coast redwood, ripening in 2 years. Bark very thick. Up to 320 feet in height and 35 feet in diameter. Trees mostly protected from cutting.
Coast redwood,* or redwood ( <i>Sequoia sempervirens</i> ).	Low mountains of Pacific coast, from southern Oregon to Monterey County, Calif.	Leaves small, $\frac{1}{2}$ inch long, thin, flat, spreading in 2 ranks. Cone small, about 1 inch long, ripening in 1 year (fig. 6, G). Up to 364 feet in height and about 25 feet in diameter. Important timber tree. A tree logged in Humboldt County, Calif., scaled 361,363 board feet of lumber.
Incense cedar ( <i>Libocedrus decurrens</i> ).	Oregon (Mount Hood) through the mountains of California.	Resinous, aromatic tree with scaly bark. Leaves variable, up to $\frac{1}{2}$ inch long; cone $\frac{1}{2}$ inch long, maturing in 1 season. Wood used for making pencils.
Western red cedar ( <i>Thuja plicata</i> ).	Coast of Washington, Oregon, northern California; inland to Montana. Alaska.	Leaves and fruit smaller than those of incense cedar (fig. 6, D). Soft, red, dish-brown wood, used for lumber and shingles.
Monterey cypress ( <i>Cupressus macrocarpa</i> ). Sargent cypress ( <i>Cupressus sargentii</i> ). Gowen cypress ( <i>Cupressus goveniana</i> ). Macnab cypress ( <i>Cupressus macnabiana</i> ). Tecate cypress ( <i>Cupressus forbesii</i> ).	Coast of southern California..... Coast region of middle California..... Mendocino and Monterey Counties, Calif. Southwestern Oregon and northwestern California. San Diego County, Calif.....	Leaves scalelike, dark green, $\frac{1}{4}$ to $\frac{1}{2}$ inch long, dull pointed. Leaves scalelike, dark green, glandular-pitted. Leaves dark green, sharp pointed. Cones $\frac{1}{2}$ inch diameter; seed dark. Cone $\frac{1}{2}$ to 1 inch in diameter, often with whitish bloom. Leaves pale bluish-green. Bark smooth, shiny. Branchlets bright red. Leaves scalelike, pale bluish-green. Bark separating into narrow fibers. Differing slightly from the above.
Arizona cypress ( <i>Cupressus arizonica</i> ). Smooth cypress ( <i>Cupressus glabra</i> ). Alaska cedar (yellow or Sitka cypress)* ( <i>Chamaecyparis nootkatensis</i> ).	Mountains of southern Arizona and New Mexico. Mountains of southern Arizona..... Oregon and Washington.....	Bark thin. Branchlets stout. Leaves bluish-green, scalelike. Wood fragrant. Important timber tree.

Name of tree	Where the tree grows	Descriptive notes
Port Orford cedar ( <i>Chamaecyparis lawsoniana</i> ).	Coast, southern Oregon and northern California.	Bark thick. Branchlets slender. Wood fragrant and easily worked. Important timber tree.
Dwarf juniper ( <i>Juniperus communis</i> ).	Across northern United States. Rocky Mountain and northern Pacific regions. (See also p. 6.)	Leaves short, $\frac{1}{2}$ inch long. Sweet aromatic berries, ripening in 3 seasons.
California juniper ( <i>Juniperus californica</i> ).	Mountains and foothills of central and southern California.	Berries reddish brown, ripening in 1 season. Leaves in clusters of 3.
Utah juniper ( <i>Juniperus utahensis</i> ).	Desert regions, Wyoming to New Mexico.	Bark falling in strips. Berry large, ripening in 1 season. Leaves opposite.
Alligator juniper ( <i>Juniperus pachyphloea</i> ).	Desert ranges Texas west to Arizona.	Bark in nearly square plates. Berry large, ripening in 2 seasons.
Western juniper ( <i>Juniperus occidentalis</i> ).	Cascades and Sierra Nevada Mountains.	Berries dark blue, small, maturing in 1 season. Bark thin. Leaves rough. Heavy branches. Tree up to 10 feet in diameter and 60 feet in height.
One-seeded juniper ( <i>cedro</i> )* ( <i>Juniperus monosperma</i> ).	Extensive areas over foothills of Rocky Mountains.	Berry small, 1-seeded. Branchlets and leaves very small; leaves rough. Berries ripening in 1 season.
Rocky Mountain red cedar ( <i>Juniperus scopulorum</i> ).	Rocky Mountains.	Berries ripening in 2 seasons. Wood red, fragrant, resembling eastern red cedar.
California nutmeg ( <i>Tumion californicum</i> ).	Coast and Sierra Nevada Mountains of California.	Leaves over 1 inch long, shiny. Fruit dark purple, 1 inch long. All of tree pungent and aromatic.
Pacific yew ( <i>Taxus brevifolia</i> ).	Pacific coast region east to northern Montana. Alaska.	Leaves less than 1 inch long, holding on for 5 to 12 years. Fruit nearly enclosed in thick cup.
California palm ( <i>Washingtonia filifera</i> ).	Southern California.	Leafstalks armed with spines. Fruit berrylike. Leaves fan-shaped. Widely planted for ornament. Flower part (style) short.
Mohave yucca ( <i>Yucca mohavensis</i> ).	Northwestern Arizona across Mohave Desert to Pacific coast.	Leaves smooth, 1 to 2 feet long.
Spanish bayonet ( <i>Yucca torreyi</i> ).	Western Texas to Arizona.	Leaves 2 to 3 feet long, 1 to 2 inches wide, concave, smooth, light green.
Spanish bayonet ( <i>Yucca schottii</i> ).	Southern Arizona.	Leaves stiff, blue-green, sharply toothed, pointed, crowded in dense clusters.
Joshua tree ( <i>Yucca brevifolia</i> ).	Southwestern Utah through Mohave Desert to California.	Flower stalks 3 to 7 feet long.
Soapweed ( <i>Yucca elata</i> ).	Texas to southern Arizona.	Leaves small, of 9 to 23 leaflets. Nuts grooved, up to 1 inch in diameter.
Little walnut ( <i>Juglans rupestris</i> ).	Texas, New Mexico, Arizona.	Leaves 8 inches long, of 11 to 15 leaflets. Nuts less than 1 inch in diameter.
California walnut ( <i>Juglans californica</i> ).	Southern California, coast region.	Leaves compound. Nuts up to 2 inches diameter.
Hinds walnut ( <i>Juglans hindsii</i> ).	Central California, coast region.	Leaves sharply toothed, narrow at base, shiny. Fruit waxy, dark purple.
Pacific wax myrtle ( <i>Myrica californica</i> ).	Coast region, California to Washington.	Leaves broad, finely toothed, leafstalks flat and long.
Aspen (quaking aspen)* ( <i>Populus tremuloides</i> ) (varieties: <i>Vancouverana</i> and <i>Aurea</i> ).	Northeastern and all western United States. (See also p. 10.)	Leaves dull-toothed, leafstalks round. Winter buds $\frac{1}{2}$ inch long, shiny, resinous.
Balsam poplar (Balm-of-Gilead)* ( <i>Populus balsamifera</i> ).	Across northern United States. (See also p. 10.)	Leaves broad, wedge-shaped at base, whitish below. Buds resinous.
Black cottonwood ( <i>Populus trichocarpa</i> ).	California Mountains and foothills.	Leaves long-pointed, narrow, 3 inches long, on long stalks. Buds resinous.
Lanceleaf cottonwood ( <i>Populus acuminata</i> ).	Rocky Mountains and foothills.	Leaves 2 to 3 inches long, narrow, tapering, sharp pointed. Buds very resinous.
Narrowleaf cottonwood ( <i>Populus angustifolia</i> ).	Rocky Mountains and foothills.	Leaves with flattened stalks, thick, coarsely toothed.
Arizona cottonwood ( <i>Populus arizonica</i> ).	Southern New Mexico and Arizona.	Resembles the above species.
Cottonwood ( <i>Populus sargentii</i> ).	Rocky Mountain foothills to Plains.	Leaves coarsely toothed, 2 to $2\frac{1}{2}$ inches long and broad. Leafstalks flattened.
(Fremont)* cottonwood ( <i>Populus fremontii</i> ).	States west of the Rocky Mountains.	Leaves broadly delta-shape (triangular), coarsely toothed, thick, firm.
(Wislizenius)* cottonwood ( <i>Populus wislizenii</i> ).	Texas, New Mexico, western Colorado.	Leaves 1 to 2 inches long, square at base, toothed. Branchlets fuzzy.
MacDougal cottonwood ( <i>Populus macdougalii</i> ).	Southern Arizona, southeastern California.	Branchlets yellow-green. Fruit hairy.
Dudley willow ( <i>Salix gooddingii</i> ).	Western Texas to California, north in State.	Leaves long, pointed (peachleaf), pale below.
Peachleaf willow ( <i>Salix amygdaloides</i> ).	Northern United States, south in Rocky Mountains. (See p. 10.)	Fruit (capsules) on long stalks.
Red willow ( <i>Salix laevigata</i> ).	Arizona, Utah, California.	Fruit (capsule) short stalked.
Willow ( <i>Salix bonplandiana toumeyi</i> ).	Arizona and New Mexico.	Leaves whitish below, stems with glands.
Western black willow ( <i>Salix lasiandra</i> ).	Central Rocky Mountains. Pacific coast.	

Name of tree	Where the tree grows	Descriptive notes
Sandbar willow ( <i>Salix sessilifolia</i> ).	Western Washington and Oregon-----	Stamens 2. Leaves small, with stems.
Narrowleaf willow ( <i>Salix exigua</i> ).	Western United States-----	Leaves white, silky below.
Yewleaf willow ( <i>Salix taxifolia</i> ).	Western Texas to Arizona-----	Leaves 1 inch long.
White willow ( <i>Salix lasiolepis</i> ).	California, southern Arizona-----	Leaves slightly toothed, pale below.
(Diamond)* willow ( <i>Salix mackenzieana</i> ).	Northern Rocky Mountains, California-----	Leaves 4 inches long, narrow pointed.
(Bebb's)* willow ( <i>Salix bebbiana</i> ).	Northern United States, south in Rocky Mountains. (See also p. 10.)-----	Leaves elliptical, silvery white below.
Scouler willow ( <i>Salix scouleriana</i> ).	Western United States-----	Leaves broadest beyond middle.
Willow ( <i>Salix hookeriana</i> ).	Oregon and Washington-----	Leaves broadly oval, fuzzy beneath.
Silky willow ( <i>Salix sitchensis</i> ).	Pacific Coast States-----	Leaves densely silky below.
Western hop-hornbeam ( <i>Ostrya knowltonii</i> ).	Colorado River in Arizona and Utah-----	Leaves 1 to 2 inches long, broad, rounded, sharply toothed. Fruit hoplike.
Paper birch ( <i>Betula papyrifera</i> ).	Northern United States, across the continent. (See also p. 10.)-----	Bark pure white to light gray, separating into thin sheets. Leaves thick, rounded at base.
Red birch ( <i>Betula fontinalis</i> ).	Rocky Mountains, Pacific coast-----	Bark firm, shiny. Leaves small.
Sitka alder ( <i>Alnus sinuata</i> ).	Northwestern coast States, Montana, Alaska-----	Flowers opening with or after the leaves. All alders have two kinds of flowers (aments) on same tree.
Red alder ( <i>Alnus rubra</i> ).	Pacific coast. Alaska-----	Flowers opening before leaves.
Mountain alder ( <i>Alnus tenuifolia</i> ).	Rocky Mountain region-----	Flowering as above. Leaves thin.
White alder ( <i>Alnus rhombifolia</i> ).	Idaho and Pacific States-----	Leaves broadly oval, rounded at ends.
Mexican alder ( <i>Alnus oblongifolia</i> ).	Arizona, southern New Mexico-----	Leaves oblong and pointed.
Golden chinquapin ( <i>Casanavopsis chrysophylla</i> ).	Pacific coast region, south to southern California-----	Leaves thick, evergreen. Nut in prickly golden burr, ripe in 2 seasons.
Tan oak ( <i>Lithocarpus densiflora</i> ).	California into southern Oregon-----	Acorn set in flat, hairy cup. Leaves toothed, evergreen, heavily veined. Acorn ripening in 2 seasons.
California black oak. ( <i>Quercus kelloggii</i> ).	Western Oregon, through mountains of California-----	Acorn in deep thin cup. (Beginning of the black oak group whose leaves have pointed lobes, if any, and whose acorns require 2 seasons to mature.) Leaves hairy below, narrow, acorn in fuzzy cup.
Whiteleaf oak ( <i>Quercus hypoleuca</i> ).	Western Texas to Arizona-----	Leaves thick, shiny, dark green. Acorn deeply enclosed in cup.
Highland live oak ( <i>Quercus wislizenii</i> ).	California, lower mountain slopes and foothills-----	Leaves similar to above. Acorn with saucer-shaped cup.
Coast live oak ( <i>Quercus pricei</i> ).	Coast of Monterey County, Calif-----	Leaves evergreen, thick, with sharp teeth, dull green, 1 to 3 inches long.
Coast live oak ( <i>Quercus agrifolia</i> ).	Coastal mountains and valleys of California-----	Leaves long, thick, leathery, evergreen. Acorns 2 inches long, in densely hairy cup.
Canyon live oak ( <i>Quercus chrysolepis</i> ).	Southern Oregon, California, southern Arizona-----	Leaves small, with smooth margins. Acorn cup mossy. (Often low shrub).
Huckleberry oak ( <i>Quercus vaccinifolia</i> ).	High Sierra Nevada Mountains of California-----	Leaves 3 or 4 inches long, broadly elliptical, toothed, thick, hairy below, evergreen.
Island live oak ( <i>Quercus tomentella</i> ).	Islands off coast of southern California-----	Leaves very shiny, flat, stiff. Acorns shiny black, much used for food. (Beginning of white oak group, whose leaves have rounded lobes, if any, and whose acorns require only 1 season to mature.)
Emory oak ( <i>Quercus emoryi</i> ).	Mountains, western Texas to southern Arizona-----	Leaves mostly 1 inch long, with shallow lobes. Acorn broad, in deep cup.
California scrub oak ( <i>Quercus dumosa</i> ).	California, Sierra Nevada and Coast Mountains-----	Leaves coarsely and deeply yellow fuzzy below. Acorn on long stems.
Netleaf oak ( <i>Quercus reticulata</i> ).	Southern parts of New Mexico and Arizona-----	Leaves tiny. Acorn in thin cup.
Toumey oak ( <i>Quercus toumeyi</i> ).	Southeastern Arizona-----	Leaves broad, thick, firm, blue-green. Acorn striped, in deep cup.
Arizona white oak ( <i>Quercus arizonica</i> ).	Southern New Mexico and Arizona-----	Leaves elliptical, blue-green. Acorn small, in shallow cup.
Mexican blue oak ( <i>Quercus oblongifolia</i> ).	Western Texas to southern Arizona-----	Leaves resembling the above, or with coarse teeth on edge.
Evergreen white oak ( <i>Quercus engelmannii</i> ).	Southern California, belt along the coast-----	Leaves blue-green, mostly 2 to 5 inches long, deeply notched or lobed. Acorn broad above base. Good-sized tree.
California blue oak ( <i>Quercus douglasii</i> ).	Southern half of California, low mountains-----	

Name of tree	Where the tree grows	Descriptive notes
Valley white oak ( <i>Quercus lobata</i> ). Oregon white oak ( <i>Quercus garryana</i> ). Rocky Mountain white oak ( <i>Quercus utahensis</i> ).	Western and southern California----- Pacific coast region south to middle California. Central and southern Rocky Mountain region.	Leaves deeply lobed. Acorn conical, long, in rather deep cup. Leaves 4 to 6 inches long, lobed, smooth above, hairy below. Leaves 3 to 7 inches long, regularly lobed. Acorn with half-round cup. Common, abundant oak.
Rocky mountain white oak ( <i>Quercus lepto-phylla</i> ). Wavyleaf shin oak ( <i>Quercus undulata</i> ).	Colorado and New Mexico----- Colorado, New Mexico, Arizona, and a little northward.	Leaves resembling above, but smooth below. Acorns small. Large spreading tree. Leaves lyre-shaped, lobed. Acorn set in shallow scaly or warty cup. Small tree.
Palo blanco ( <i>Celtis reticulata</i> ). Douglas huckleberry ( <i>Celtis douglasii</i> ). (Western)* mulberry ( <i>Morus microphylla</i> ). California-laurel ( <i>Umbellularia californica</i> ).	Oklahoma and Texas to southern Arizona. Rocky Mountain region, Canada to Mexico. Texas, southern parts of New Mexico and Arizona. Oregon and through foothills of California.	Leaves green on lower surface. Berry orange-red. Leaves ovate, heart-shaped at base, coarsely toothed, rough above. Leaves small, rounded, coarsely toothed. Fruit nearly black, sweet. Leaves long, elliptical, 2 to 5 inches, evergreen. Fruit rounded, 1 inch long, in clusters.
California sycamore ( <i>Platanus racemosa</i> ). Arizona sycamore ( <i>Platanus wrightii</i> ). (N a m e ?) ( <i>Vauquelinia californica</i> ). Santa Cruz ironwood ( <i>Lyonothamnus floribundus</i> ). Oregon crab apple ( <i>Malus fusca</i> ).	Southern half of California----- Arizona, southwestern New Mexico----- Southern New Mexico and Arizona . Islands off coast of southern California. Northern California, western Oregon, and Washington. Alaska.	Fruit balls in string of 3 to 5. Leaves with 3 to 5 pointed lobes. Leaves with 5 to 7 deep lobes. Fruit balls in string 6 to 8 inches long. Leaves narrow, toothed, hairy beneath. Leaves willowlike, or deeply divided (pinnae), about 4 to 8 inches long.
Pacific mountain-ash ( <i>Sorbus sitchensis</i> ). Alpine mountain-ash ( <i>Sorbus occidentalis</i> ). Christmasberry ( <i>Photinia salicifolia</i> ).	California, Oregon, Washington, Idaho. Alaska. Near timber line in northern Rocky Mountains. Alaska. Southern half of California-----	Leaves broadly oval, sharply toothed. Fruit oblong, yellow-green to nearly red. Leaflets shiny, thin, narrow. Fruit red. Flowers fragrant. Berries pear shape, purplish.
Pacific serviceberry ( <i>Amelanchier florida</i> ). Willow thorn ( <i>Crataegus saligna</i> ).	Rocky Mountains to north Pacific coast region. Alaska.	Leaves elliptical, sharply but finely toothed, shiny, evergreen. Scarlet berries in clusters.
Black hawthorn ( <i>Crataegus douglasii</i> ). Thorn* ( <i>Crataegus rivularis</i> ).	Pacific coast region south to California, Northern Rocky Mountains to Wyoming.	Leaves rounded, coarsely toothed above middle. Small clusters of blue berries.
Bigleaf-mountain mahogany ( <i>Cercocarpus traskiae</i> ).	Rocky Mountains----- Santa Catalina Island, Calif-----	Leaves oval or squared, 1 to 2 inches long, finely toothed. Fruit very shiny blue-black. Small tree. Leaves thick, shiny, squared, notched, and finely toothed. Many short stout spines. Clusters of black berries. Small tree.
Curlleaf mountain-mahogany ( <i>Cercocarpus ledifolius</i> ). Birchleaf mountain-mahogany ( <i>Cercocarpus betuloides</i> ). Alderleaf mountain-mahogany ( <i>Cercocarpus alnifolius</i> ). Hairy mountain-mahogany ( <i>Cercocarpus paucidentatus</i> ). Cliffrose ( <i>Cowania stansburiana</i> ). Wild plum (hog or red plum)* ( <i>Prunus americana</i> ).	Northern Rocky Mountains south to Colorado. Eastern and southern California. Coast mountains of California----- Santa Catalina and Santa Cruz Islands. Western Texas, New Mexico, Arizona. Colorado, Utah, and South----- Eastern United States, central and southern Rocky Mountains. (See also p. 17.)	Leaves without lobes, thinner than above, pointed, dull green. Spines few. Leaves rounded, coarsely toothed toward end, woolly below. Flowers in cluster. Flowers singly on stem. (All mahoganies have long silky threads to the seeds.) Small tree. Leaves small, narrow, up to 1 inch long, pointed at both ends. Small tree. Leaves small, 1 inch long, finely toothed, wider beyond middle.—Flowers in cluster. Small tree. Leaves oval, long toothed, smooth below. Flowers on long stems in cluster. Small tree. Leaves 1 inch long, broader toward end, smooth or slightly toothed. Flowers singly. Small tree. Long feathery thread from each seed.
Pacific plum ( <i>Prunus subcordata</i> ). Bitter cherry ( <i>Prunus emarginata</i> ). Pin cherry ( <i>Prunus pensylvanica</i> ) (variety <i>saximontana</i> ).	Central Oregon to California----- Rocky Mountains and westward----- Across northern United States, northern Rocky Mountains to Colorado. (See also p. 17.)	Leaves oval, sharply toothed, 3 to 4 inches long. Fruit 1 inch in diameter, bright red. Usually only a shrub in this region. Leaves broadly ovate. Fruit red or yellow. Fruit small, bright red, shiny, bitter.
		Leaves long, pointed, finely toothed. Flowers in clusters (umbels), cherries red, each on long stem, spreads rapidly on burned-over forest lands.

Name of tree	Where the tree grows	Descriptive notes
Western choke cherry ( <i>Prunus demissa</i> ). Black choke cherry ( <i>Prunus melanocarpa</i> ). Southwestern black cherry ( <i>Prunus virens</i> ). Hollyleaf cherry ( <i>Prunus ilicifolia</i> ). Catalina cherry ( <i>Prunus lyonii</i> ). (Name?) ( <i>Lysiloma watsonii</i> ). Catclaw (una-de-gato)* ( <i>Acacia greggii</i> ). ( <i>Mimosa</i> )* ( <i>Leucaena retusa</i> ). Mesquite ( <i>Prosopis juliflora</i> ).	Southwestern New Mexico, southern California. Southern Rocky Mountains. Western Texas, New Mexico, Arizona. Coast mountains of southern California. Coast Islands, including Santa Catalina, Calif. Southern Arizona. Western Texas, southern New Mexico, Arizona. Southern parts of Texas and New Mexico. (See also p. 18.) Texas, Oklahoma, New Mexico, Arizona, California. Kansas to California and southward. (See also p. 18.) Southern Arizona. Western Texas to California, Utah, Nevada. Coast ranges and lower slopes of Sierras, Calif., Utah. Texas, Arizona. Southern parts of Arizona and California. Southern parts of Arizona and California. Southern parts of Texas and New Mexico. Southern California east to Mississippi River. (See p. 18.) Western Texas to Arizona. Deserts of Arizona, California. Southern Rocky Mountain region. Deserts of Arizona, California. Eastern United States, southern Rocky Mountains. (See also p. 19.) Arizona, southern California. Coast region of southern California. Arizona, southern California. do. Coast of California, Oregon, and Washington, Alaska. Pacific coast region. Plains and western mountains. Northern Rocky Mountain and northern Pacific regions. Alaska. Southern New Mexico. Rocky Mountains, from Montana and Idaho to Mexico. Eastern half of United States; this variety in northern Rocky Mountains. (See also p. 20.) Rocky Mountain region (Canada to Mexico). Southern half of eastern California.	Leaves often heart-shaped at base, and fine-hairy below. Leaves thicker and fruit darker than above. Leaves small, elliptical, finely toothed. Fruit purplish black, in long clusters. Leaves broadly oval, coarsely and sharply toothed, leathery. Fruit dark purple. Leaves thick, shiny, slightly toothed. Fruit purple to nearly black. Leaves small of leaflets, densely hairy. Flowers in round head. Pods 1 inch wide. Leaves thick, shiny, slightly toothed. Fruit purple to nearly black. Leaves small, of 1 to 3 pairs of leaf clusters (pinnae). Pods flat, twisted, 2 to 4 inches long. Leaves featherlike compound of many leaflets. Leaves doubly compound (mostly 2 pinnae) each with 12 to 22 leaflets. Pods flattened, in small clusters, remaining closed. Leaves generally similar to above, 9 inches long, leaflets often 2 inches long. Leaves similarly compound, 5 to 6 inches long, finely hairy. Leaves smaller than above. Pods small, spirally twisted or screwed. Leaves broad, rounded, heart-shaped at base. Flowers rose color. Leaflets 50 to 60, small. Spiny stems. Leaves tiny, of few pairs of leaflets. Flowers pale yellow. Leaves 1 inch long, of few tiny leaflets. Branches with yellow-green bark. Leaves 4 to 6 inches long, of 7 to 9 rounded leaflets. Pods narrowed between seeds. Leaves of 13 to 19 leaflets. Pods bearded. Leaves of 20 to 46 leaflets, terminal. Branches spiny. Leaves soon dropping. Leaves of 15 to 21 broad leaflets. Flowers rose to white. Pods 3 inches long. Leaves tiny, compound. Flowers purple. Leaves 3-divided, alternate on stem. Seed enclosed in thin, papery, circular wing. Leaves of tiny leaflets. Fruit 3-angled. Leaves not compound, edges prickly. Thick fruit in terminal clusters. Leaves not compound, evergreen, aromatic. Tree leafless. Twigs ending in spines. Leaves opposite, 10 inches across, on long stems, 3 large and 2 small lobes. Low tree, almost vinelike, in thickets, leaves opposite, rounded, with 7 to 9 lobes. Leaves opposite, rounded, 3-lobed or parted, toothed. Leaves 3-lobed. Keys with erect, broad wings. Leaves hairy, small. Keys short. Leaves opposite, thick, firm, green, shiny above, fuzzy below, 3-lobed. Leaves opposite, thin, mostly compound of 3, 5, or 7 leaflets. Twigs greenish. Leaves compound, opposite, thick, not densely hairy. Young twigs smooth. Keys spreading. Hardest boxelder and widely planted. Leaves thick, opposite, mostly compound, densely hairy below. Young twigs velvety. Keys parallel.

Name of tree	Where the tree grows	Descriptive notes
California buckeye ( <i>Aesculus californica</i> ).	Southern half of California, in mountains.	Leaves of 4 to 7 leaflets, opposite. Flowers white or pale red. Winter buds resinous.
Western soapberry ( <i>Sapindus drummondii</i> ).	Southern Rocky Mountain region and eastward.	Leaves 8 to 18, dropping in fall, leaf stem not winged. Fruit black.
Mexican-buckeye ( <i>Ungnadia speciosa</i> ).	Eastern Texas to New Mexico.	Leaflets 7, shiny, dark green, pointed.
Hollyleaf buckthorn ( <i>Rhamnus crocea</i> ).	Southern mountain ranges of Arizona and California.	Leaves rounded, 1 inch across, sharp spiny teeth, dark yellow beneath.
Cascara ( <i>Rhamnus purshiana</i> ).	Western Rocky Mountain and Pacific Coast States.	Leaves 5 inches long, broadly elliptical, strongly veined. Fruit black, round with 2 or 3 coffee berry seeds. Bark medicinal.
Island myrtle ( <i>Ceanothus arboreus</i> ).	Islands off coast of southern California.	Leaves 3-ribbed, broad, fuzzy. Flowers pale blue, in dense clusters. Fruit 3-lobed.
Blue myrtle ( <i>Ceanothus thyrsiflorus</i> ).	Western California.	Leaves narrowed at base, 3-ribbed, smooth.
Spiny myrtle ( <i>Ceanothus spinosus</i> ).	Coast of southern California.	Branchlets spiny-pointed. Leaves with midrib.
Flannelbush ( <i>Fremontodendron californicum</i> ).	Entire eastern California, southern Arizona.	Leaves thick, 3-lobed, red on lower surface. Flowers yellow.
Allthorn ( <i>Koeberlinia spinosa</i> ).	Southern Texas west to Arizona.	Almost leafless, spiny. Bark green.
Giant cactus ( <i>Carnegiea gigantea</i> ).	Central and southern Arizona.	Tree cactus, with spines and bristles but no leaves. Flowers large, white.
Cholla ( <i>Opuntia fulgida</i> )	Southern Arizona	Cactus. Leaves pale green. Flowers pink.
Tasajo ( <i>Opuntia spinosior</i> )	do	Cactus. Spines white. Flowers yellow.
Cholla ( <i>Opuntia versicolor</i> )	do	Cactus. Spines brown. Flowers green.
Pacific dogwood ( <i>Cornus nuttallii</i> ).	Pacific coast, Washington to southern California.	Leaves opposite. Flower head enclosed by showy white bracts. Fruit red.
Tasseletree ( <i>Garrya elliptica</i> ).	Coast, Oregon and California.	Leaves opposite, leathery, woolly beneath.
Pacific madrone (manzanita)* ( <i>Arbutus menziesii</i> ).	Pacific coast region, inland in eastern California.	Leaves oblong, thick, 3 to 5 inches long. Bark reddish brown.
Texas madrone ( <i>Arbutus texana</i> ).	Western Texas.	Leaves narrow oval, thick, firm.
Arizona madrone ( <i>Arbutus arizonica</i> ).	Southern Arizona.	Leaves 2 to 3 inches long, narrow, pointed, firm. Bark ashy gray.
Fragrant ash ( <i>Fraxinus cuspidata</i> ).	Southwestern Texas and adjacent New Mexico.	Leaves opposite (like all ashes), compound of narrow leaflets. Flowers with pistil and stamens (perfect).
Littleleaf ash ( <i>Fraxinus greggii</i> ).	Western Texas.	Leaves opposite, rounded at end. Flowers with calyx, no corolla.
Singleleaf ash ( <i>Fraxinus anomala</i> ).	Western Colorado, Utah, and southward.	Leaves opposite, not compound (simple). Flowers polygamous, with calyx, no corolla.
Ash ( <i>Fraxinus lowellii</i> )	Northern Arizona.	Leaves opposite, small, mostly of 5 leaflets. Branchlets 4-sided.
Ash ( <i>Fraxinus standleyi</i> )	Western New Mexico, Arizona.	Leaves opposite, of 5 or 7 leaflets, smooth above.
Red ash ( <i>Fraxinus pennsylvanica</i> ) (Green ash var. <i>lanceolata</i> ).	Eastern half of United States, Rocky Mountains. (See also p. 23.)	Leaves opposite, of 7 or 9 smooth pointed, long - stemmed leaflets. Branchlets smooth.
Velvet ash ( <i>Fraxinus velutina</i> ).	Southern New Mexico, Arizona.	Leaflets 3 or 5, small, broadly oval. Branchlets hairy.
Toumey ash ( <i>Fraxinus toumeyi</i> ).	Arizona and New Mexico.	Leaves of 5 to 7 narrow, pointed, toothed leaflets.
Leatherleaf ash ( <i>Fraxinus excelsior</i> ).	Utah, Nevada, and southeastern California.	Leaflets thicker and coarsely toothed. Branchlets nearly smooth.
Oregon ash ( <i>Fraxinus oregona</i> ).	Pacific coast region of Washington, Oregon, California.	Leaflets mostly 5 or 7, closely attached (sessil), finely hairy, broadly oblong.
Anacahuita ( <i>Cordia boissieri</i> ).	Texas and southern New Mexico.	Leaves broadly oval, 4 to 5 inches long. Flowers white. Fruit partly enclosed.
Desert willow ( <i>Chilopsis linearis</i> ).	Western Texas to southern California.	Leaves 6 to 12 inches long, narrow, opposite or alternate. Pods slender.
Buttonbush ( <i>Cephaelanthus occidentalis</i> ).	Eastern United States, across New Mexico and Arizona to California. (See also p. 24.)	Broadly elliptical and opposite leaves, on stout stems. Flowers in round heads or balls.
Blueberry elder ( <i>Sambucus cerulea</i> ).	Western United States, east to the Great Plains.	Leaves opposite, of 5 to 9 leaflets. Berries with blue bloom, sweet, juicy.
Velvet elder ( <i>Sambucus velutina</i> ).	High mountains of eastern California, Nevada.	Leaves opposite, leaflets soft hairy below.
Redberry elder ( <i>Sambucus calicarpa</i> ).	Northern California through Oregon and Washington.	Flowers and fruit in oval (not flat) clusters. Berries red.
Nannyberry ( <i>Viburnum lentago</i> ).	Northeastern United States west into northern Rocky Mountains. (See also p. 24.)	Leaves opposite, on winged leaf stems. Winter buds long-pointed.

### FOREST REGIONS OF THE UNITED STATES

Different kinds or species of trees are found in natural association or mixtures and prevail in different portions of the United States. This is largely the result of varying conditions of temperature and rainfall or snowfall, and secondarily, of soil conditions. There are 6 natural forest regions in continental United States, 2 each in Alaska and Hawaii, and 3 in Puerto Rico.

Most of the trees of a given forest region are different from those in the others, yet a considerable number are found in at least 2 and a few in 3 regions, especially in the eastern part of the United States where the large regions intergrade gradually. This difference in the predominance of various species is rather marked in the 2 forest regions of the western portion of the United States, divided partly at least by the extensive and nearly treeless interior basin extending from southeast Washington south to Mexico.

The 4 forest regions of the eastern half of the United States are the northern, central hardwood, southern, and tropical; the 2 of the western portion, the Rocky Mountain and Pacific coast. These are shown in figure 7. The forests of Alaska divide themselves into the coast and interior forest regions; those of Puerto Rico into mangrove swamp, wet, and dry forests; and those of Hawaii into the wet and dry forests, as shown respectively in figures 8, 9, and 10.

#### EXTENT OF FORESTS

The original forests of the United States, exclusive of Alaska and the island possessions, are estimated to have covered a total area of about 820,000,000 acres, or nearly one-half (42 percent) of the total land area. Reduced mainly by clearing land, there now remains a little over one-half (60 percent) of this or a total forest area estimated at 495,000,000 acres. The bulk of this is classed as commercial forest land, which means land that is in timber or capable of producing it from young growth.<sup>13</sup>

About three-fourths of the forest-producing land area of the United States lies east of the Great Plains. This land contains only about one-tenth of the remaining virgin timber, but a very large quantity of second-growth or young timber. The other one-fourth of the forest land, with nine-tenths of the total virgin timber but little second growth, is located in the Rocky Mountain and Pacific coast regions.

The change in the past from forest to cleared land has obviously taken place in the most fertile and accessible regions. In the Central and South Atlantic States less than one-half of the original land still remains in timber growth. In the Rocky Mountain States the reduction in area has been only slight. New England, a hundred years ago, had much cleared land in farms, of which a considerable amount has since gone back to forest, so that the present forest area is about 70 percent of the original. This same process has tended to increase slightly the area of forest land elsewhere in the United States.

<sup>13</sup> This and the next topic are based upon data in the following publication: UNITED STATES DEPARTMENT OF AGRICULTURE, FOREST SERVICE. A NATIONAL PLAN FOR AMERICAN FORESTRY. Letter from the Secretary of Agriculture in response to S. Res. 175 . . . the report of the Forest Service of the Agriculture Department on the forest problem of the United States. 2 v., illus. 1933. (73d Cong., 1st sess., S. Doc. 12.)

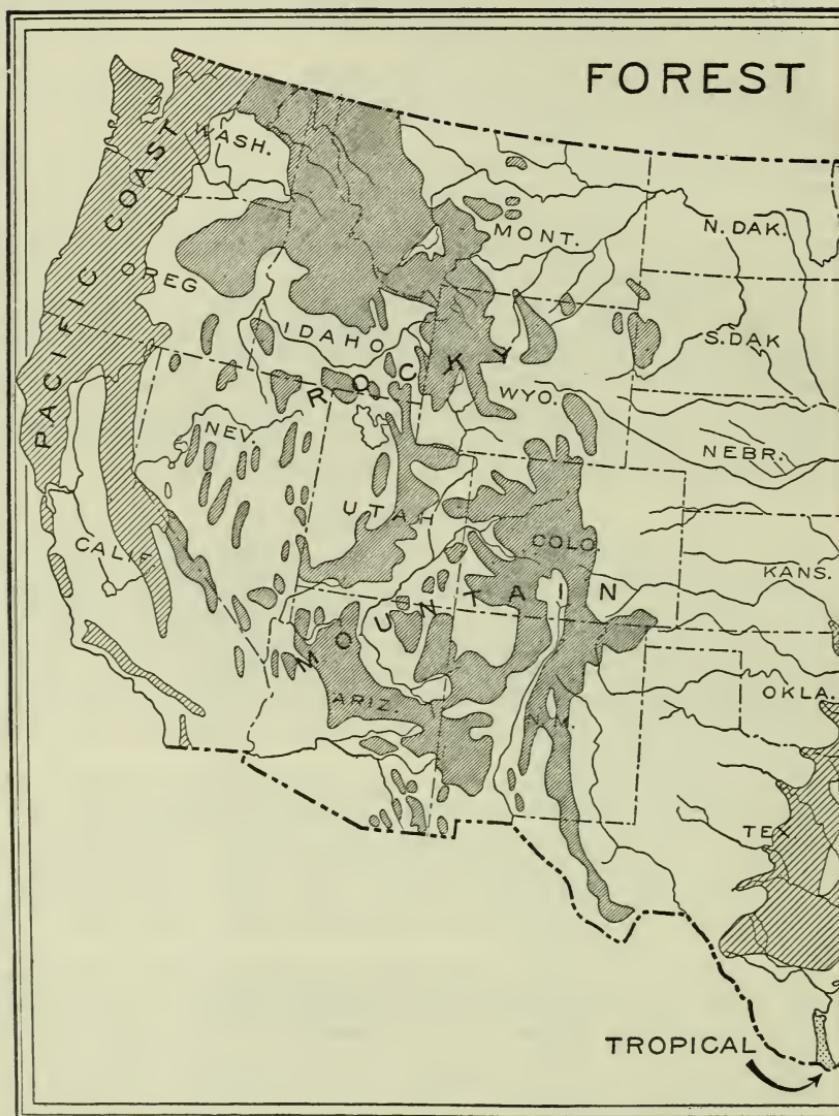
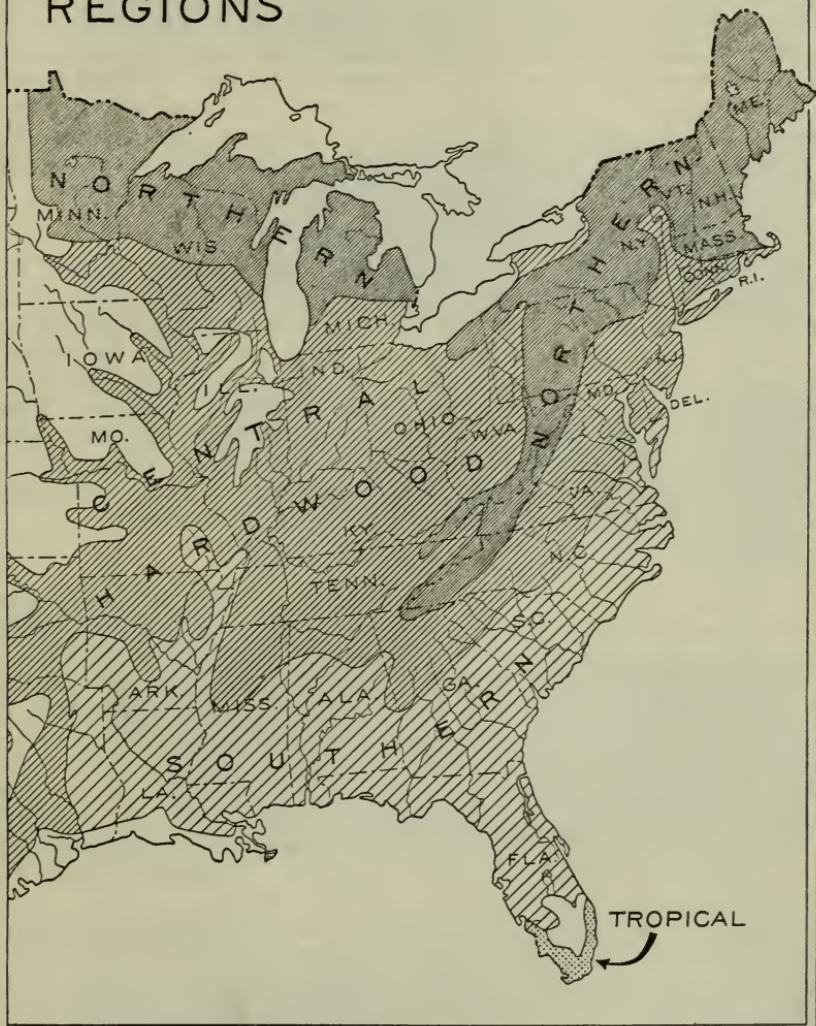


FIGURE 7.—Forest regions of the United States. The 6 natural forest regions from east to west are these regions are found many different forest types each composed of different groups continental United States, including the names of the principal trees of each region, will be

## REGIONS



the northern, central hardwood, southern, tropical, Rocky Mountain, and Pacific coast. Within  
of species in natural association or communities. Descriptions of the various forest regions in con-  
found on pages 39 to 46, inclusive.

Of the total commercial forest land of 495,000,000 acres in area, about 189,000,000 acres are bearing timber of saw-timber sizes, of which about 99,000,000 acres are in virgin timber and 90,000,000 in second-growth timber; 121,000,000 acres in smaller timber suitable for ties, pulpwood, or fuel wood; 102,000,000 acres of young growth, and 83,000,000 acres with inadequate stands of young trees. In addition, there are some 100,000,000 acres of noncommercial forest land of low grade, chiefly bearing scrubby growth. Or to picture the present condition in a slightly different way: Of every 100 acres of the original forest land with virgin timber only about 20 acres still remain; 80 acres have been cut or destroyed by fire. Out of every 100 acres of present forest land (of all classes), 38 have trees of saw-log sizes, 24 have only small timber of cordwood sizes (pulpwood, fuel wood, etc.), 21 acres are restocking fairly well with young growth, and 17 acres have little or no forest growth of any kind.

#### TIMBER CONTENTS OF FORESTS

A brief consideration of the amount of the standing timber resources of the United States may be of interest. The total wood supplies of all kinds found in our forests, including that suitable for saw timber, pulpwood, crossties, poles, piling, posts, and fuel wood, is estimated at 487 billion cubic feet. Of this, 229 billion cubic feet, is saw-timber material and the remainder cordwood material. This may not mean much, but a billion cubic feet of wood makes a solid stack 100 feet high, 100 feet wide, and 19 miles long. The bulk of our timber consists of softwoods (pines, spruces, firs, etc.), with only about 27 percent, or 129 billion cubic feet, of hardwoods.<sup>14</sup>

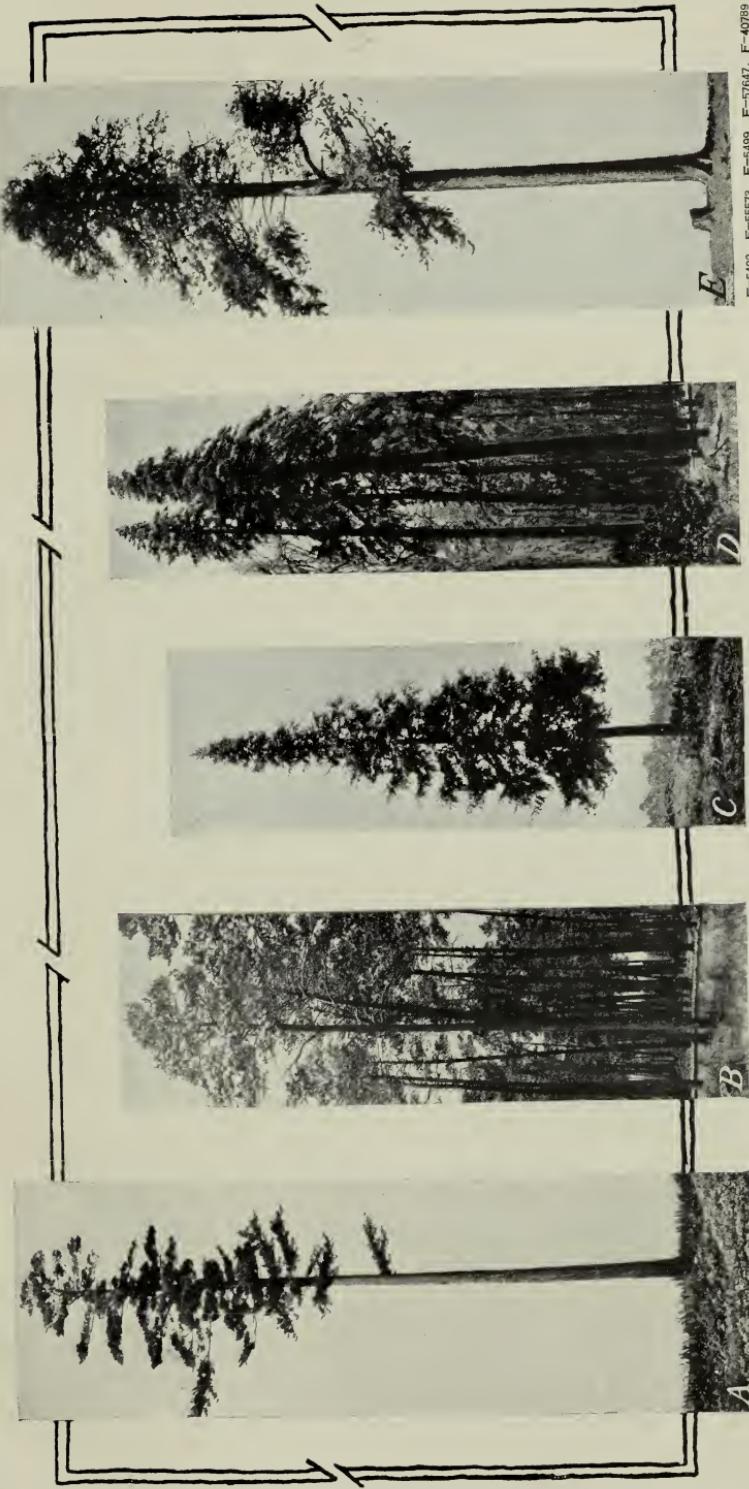
#### SAW TIMBER

The present forest, it is estimated, has one-third as much saw timber as was contained in the original or virgin forest of the United States. Much of this represents new growth on lands formerly cut over in lumbering. The estimates show a stand of 1,346 billion board feet of old-growth or virgin saw timber and 322 billion feet of second growth. Of these amounts, 1,486 billion board feet are softwoods, such as pines, spruces and firs, and 182 billion board feet hardwoods. The saw timber is very irregularly distributed over the country. For its area, New England has considerable saw timber. The southeastern portion of the United States has approximately one-half the total second-growth saw timber. The bulk of the remaining old-growth timber is in the Western States.

Four-fifths of the present total stand of saw timber lies west of the Great Plains, leaving only one-fifth for the eastern half of the United States. The bulk of the western timber consists of Douglas fir, ponderosa (western yellow) pine, lowland white, noble and silver firs, western hemlock, western red cedar, Sitka and Engelmann spruces, redwood and sugar pine. The eastern saw-timber stand (354 billion board feet) consists largely of the southern yellow pines, northern spruces, and balsam fir, southern cypress, oaks (over a dozen species), birches, beech, and maples, gums, yellow (or tulip) poplar, ashes, and hickories.

The national forests contain about one-third of the standing saw timber and the lumbermen own nearly one-half of the total. Farmers

<sup>14</sup> UNITED STATES DEPARTMENT OF AGRICULTURE, FOREST SERVICE. See footnote 13.



IMPORTANT CONIFERS OF THE NORTHERN FOREST REGION.

A, Northern white pine. B, Red (Norway pine). C, Balsam fir. D, Red spruce. E, Eastern hemlock.



F-236616, F-14534, F-39308A, F-235124

SOME NORTHERN HARDWOOD TREES.

A, Basswood. B, Shagbark hickory. C, Northern red oak. D, Sugar maple.

own about one-twelfth of the saw timber and one-third of the cordwood timber. About 88,000,000 acres of commercial forest land are in public ownership mostly in the national forests, 10,600,000 in State, county, or town ownership, while 150,000,000 acres are owned by farmers and 247,000,000 acres by other private individuals or lumber concerns.

#### CORDWOOD

A vast amount of timber less than saw-timber size is now growing in our forests. A portion is found in saw-timber trees, while the greater amount is on forest lands where the trees have not yet reached saw-timber sizes. The total amount is estimated at nearly 2,400,000,000 cords. The annual cut of cordwood material for all purposes, including fuel wood and pulpwood, is probably about 80,000,000 cords. The total supply of wood suitable for paper pulpwood is estimated at 1,800 million cords, or about one-third of the total quantity of wood of all kinds and sizes in continental United States. Nearly one-half is in the southeastern part of the country, one-fifth in the Pacific-coast region, one-tenth in New England, and the rest in the central and Rocky Mountain regions.

#### FOREST DRAIN AND GROWTH

The total amount of timber being cut or destroyed is estimated at 16 billion cubic feet yearly. Of the drain on forests as a whole, about 5 percent is due to fire, 6 percent to insects, disease, drought, or wind, and 86 percent to cutting for use. The yearly drain of standing saw timber by cutting for lumber and by other losses amounts to a total of 59 billion board feet, or six times the amount of growth of that class of timber.<sup>15</sup>

The yearly growth of timber of all kinds or species in the United States (continental area) has been estimated at a little over 7 billion cubic feet. Of this a little over one-half is softwoods (pines, spruces, firs, etc.). The yearly growth of saw timber is estimated at a total of 9.7 billion board feet. Of this two-thirds is softwoods and one-third hardwoods. More than one-half of the total growth of all timber, including saw timber, is taking place on somewhat more than 100 million acres of forest land in the southeastern portion of the United States (southern and a portion of the central hardwood forest regions). The western forest region is making a small growth because of the larger percentage of old growth timber and young timber.

Thus the forest timber supplies of the United States are being seriously depleted. The total yearly drain on saw timber amounts to about six times the estimated yearly growth, and about twice for all kinds of wood in trees including saw timber and all smaller material.

#### FOREST TYPES OR TREE ASSOCIATIONS

Within each of the forest regions are found various natural groups or associations of different species of trees. They occur over areas varying widely in extent from a few acres to millions of acres. Such groups or tree associations are known as "forest types."

<sup>15</sup> The relation between cubic feet of wood in trees and board feet of saw timber varies greatly with the size and shape of the trees. In round figures, the present estimates are based upon 1,000 cubic feet of wood in trees yielding about 4,000 board feet of saw timber and 3,000 cords of wood. Saw-timber trees often yield 5,000 board feet of saw timber for each 1,000 cubic feet of wood in the tree.

Forest types may be compared to the make-up of various associations of people within a large city where, over rather extensive areas, one or different races predominate, either as a single race or, as often happens, two or more compatible races that are able to cooperate or supplement each other in making the best of existing conditions. The forest types that prevail over extensive areas have been defined and named by the one or more dominating kind or species of trees and have come to be well known. Such, for example, are the spruce-fir and the birch-beech-maple types within the northern forest region, and the Douglas fir and sugar pine-ponderosa pine types of the Pacific coast forest region as shown below.

*Forest types composing each of the six forest regions of continental United States<sup>16</sup>*

	Acres
<b>Northern:</b>	
Pines-----	14, 487, 000
Spruces and firs-----	29, 908, 000
Aspen-----	21, 688, 000
Birch-beech-maples-----	17, 118, 000
<b>Total-----</b>	<b>83, 201, 000</b>
<b>Central hardwood:</b>	
Oaks-hickories-----	44, 342, 000
Oaks-pines-----	35, 575, 000
Oaks-chestnut-yellow poplar-----	52, 459, 000
<b>Total-----</b>	<b>132, 376, 000</b>
<b>Southern:</b>	
Southern pines (8 species)-----	126, 027, 000
Cypress-southern hardwoods-----	23, 412, 000
<b>Total-----</b>	<b>149, 439, 000</b>
<b>Tropical:</b>	
Mixed hardwoods (tropical)-----	400, 000
<b>Total-----</b>	<b>400, 000</b>
<b>Rocky Mountain:</b>	
Ponderosa pine-----	21, 811, 000
Western white pine-western larch-----	12, 984, 000
Lodgepole pine-----	16, 541, 000
Spruces-firs-----	11, 563, 000
<b>Total-----</b>	<b>62, 899, 000</b>
<b>Pacific coast:</b>	
Douglas fir-----	27, 687, 000
Ponderosa pine-----	25, 070, 000
Sugar pine-ponderosa pine-----	10, 183, 000
Western white pine-western larch-----	669, 000
Spruces-firs-----	1, 532, 000
Coast redwood-bigtree-----	1, 544, 000
<b>Total-----</b>	<b>66, 685, 000</b>
<b>United States-----</b>	<b>495, 000, 000</b>

<sup>16</sup> Does not include Alaska, Puerto Rico, and Hawaii (figs. 8, 9, and 10). (See fig. 7.)

### NORTHERN FOREST REGION

The northern forest region covers most of New England and New York, extends southward over the Allegheny Plateau and Appalachian Mountains to northern Georgia, and in the Lake States includes most of Michigan, Wisconsin, and Minnesota (fig. 7). It was the first land in the United States to be logged and it now contains only insignificant areas of virgin timber. Cutting is going on mostly in small-sized timber which produces small dimension lumber (used for boxes and many forms of novelties), pulpwood, and fuel wood. The area of all types in forest or woods is roundly estimated at 83,201,000 acres divided into 17,118,000 acres of birch-beech-maple type, 14,487,000 of pine type, 21,688,000 acres of aspen type, and 29,908,000 acres of spruce-fir type. The reestablishment of forests on denuded or abandoned agricultural land is progressing rapidly either naturally or by planting in this region, especially on low-grade farm lands in New York and Michigan, where public and private agencies are working aggressively. Forest protection is well developed, and the use of forests for game and recreational purposes is important.

The northern forest region is characterized by the predominance of northern white pine, eastern hemlock, red and white spruces, gray, paper, sweet, and yellow birches, beech, sugar maple, basswoods, and northern red and scarlet oaks (pls. 3 and 4). Each of these species varies in abundance in different parts of the region, and most of them are absent in some places. For example, northern white pine is relatively abundant in the southern parts of Maine and New Hampshire, red or Norway pine in northern Minnesota, red spruce in upper Maine, New Hampshire, and New York, and white spruce in the northern portions of Michigan, Wisconsin, and Minnesota. The southern extension of the region is characterized by an abundance of oaks of various kinds, chestnut, black gum, yellow poplar, cucumber tree, black locust, and southern balsam fir. Once chestnut formed more than one-half of the total stand, but the blight has reduced the species to a remnant in the extreme southern portion. Vast quantities of chestnut wood and bark have been used for tannin extract (acid wood) and the straight trees for poles.

The more abundant or valuable trees composing the two divisions of the northern forest region in their relative importance beginning with the highest are as follows:

#### NORTHERN FOREST TREES

**Northern portion:**

- Red, black, and white spruces.
- Balsam fir.
- White, red (Norway), jack, and pitch pines.
- Hemlock.
- Sugar and red maples.
- Beech.
- Northern red, white, black, and scarlet oaks.
- Yellow, paper, black, and gray birches.

**Northern portion—Continued.**

- Aspen (popple) and largetooth aspen.
- Basswoods.
- Black cherry.
- American, rock, and slippery elms.
- White and black ashes.
- Shagbark and pignut hickories.
- Butternut.
- Northern white cedar.
- Tamarack.

## NORTHERN FOREST TREES—Continued

Southern portion (Appalachian region):	Southern portion (Appalachian region)—Continued.
White, northern red, chestnut, black, and scarlet oaks.	Southern balsam fir.
Chestnut.	Yellow poplar (tulip poplar).
Hemlock.	Cucumber magnolia.
White, shortleaf, pitch, and Virginia (scrub) pines.	Black walnut and butternut.
Black, yellow, and river birches.	Black cherry.
Basswood.	Pignut, mockernut, and red hickories.
Sugar and red maples.	Black locust.
Beech.	Black gum.
Red spruce.	Buckeye.

## CENTRAL HARDWOOD FOREST REGION

The hardwood trees as a group reach their maximum number of different species, and for many of them the highest number of individual trees in a given species, in the central hardwood forest region. As shown in figure 7, the region covers a large amount of the central portion of the eastern half of the United States. Its area is approximately 132,376,000 acres, or about 27 percent of the total forest area of the country. Excluding the southern Appalachian Mountain country, it extends from Connecticut westward to southern Minnesota and south through the piedmont area and the Cumberland Plateau to the northern parts of Georgia, Alabama, and Mississippi, and through Arkansas to eastern Oklahoma and central Texas.

In the northern portion of the range, chestnut was formerly the most abundant tree. The region is strongly characterized by the variety and abundance of different oaks and hickories, and, on the better soils, yellow or tulip poplar and the tree "aristocrat"—the black walnut (pl. 5).

Generally distributed over the region are white and black oaks, mockernut and pignut hickories, American elm, red maple, and sycamore. The northern red and scarlet oaks of the northern division of the region give way in the southern division to the southern red, post, and willow oaks. Chestnut (formerly very abundant), shagbark hickory, sugar maple, and rock elm practically drop out, while shortleaf pine greatly increases in abundance, dogwood and eastern red cedar become commercially important, and Osage-orange and persimmon appear frequently. The Texas extension of the region comprises vast areas of small-sized trees of post, southern red, and blackjack oaks, mesquite, and a number of different junipers or cedars.

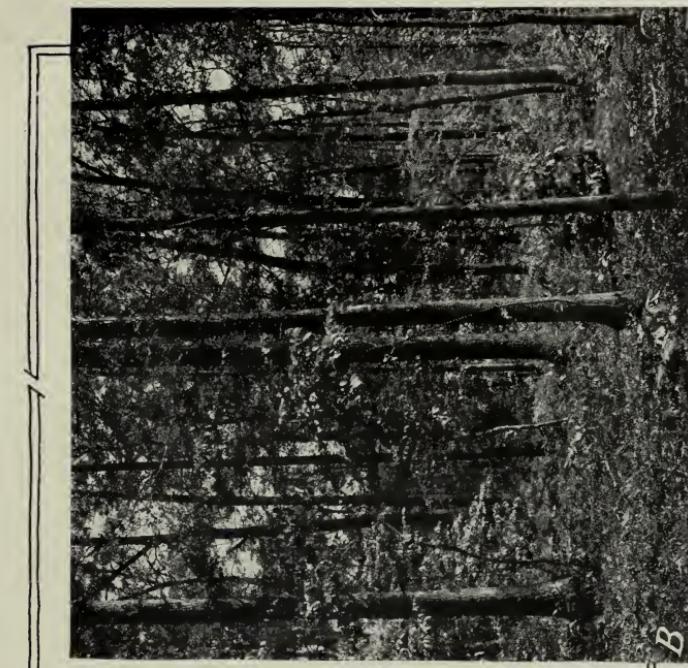
The principal kinds of trees that make up the two divisions of the central hardwood forest region, in the relative order of their importance, are:

## CENTRAL HARDWOOD FOREST TREES

Northern portion:	Northern portion—Continued.
White, black, northern red, scarlet, bur, chestnut, and chinquapin oaks.	Beech.
Shagbark, mockernut, pignut, and butternut hickories.	Pitch, shortleaf, and Virginia pines.
White, blue, green, and red ashes.	Yellow poplar (tulip poplar).
American, rock, and slippery elms.	Sycamore.
Red and silver maples.	Chestnut.
	Black walnut.
	Cottonwood.
	Black locust.



A

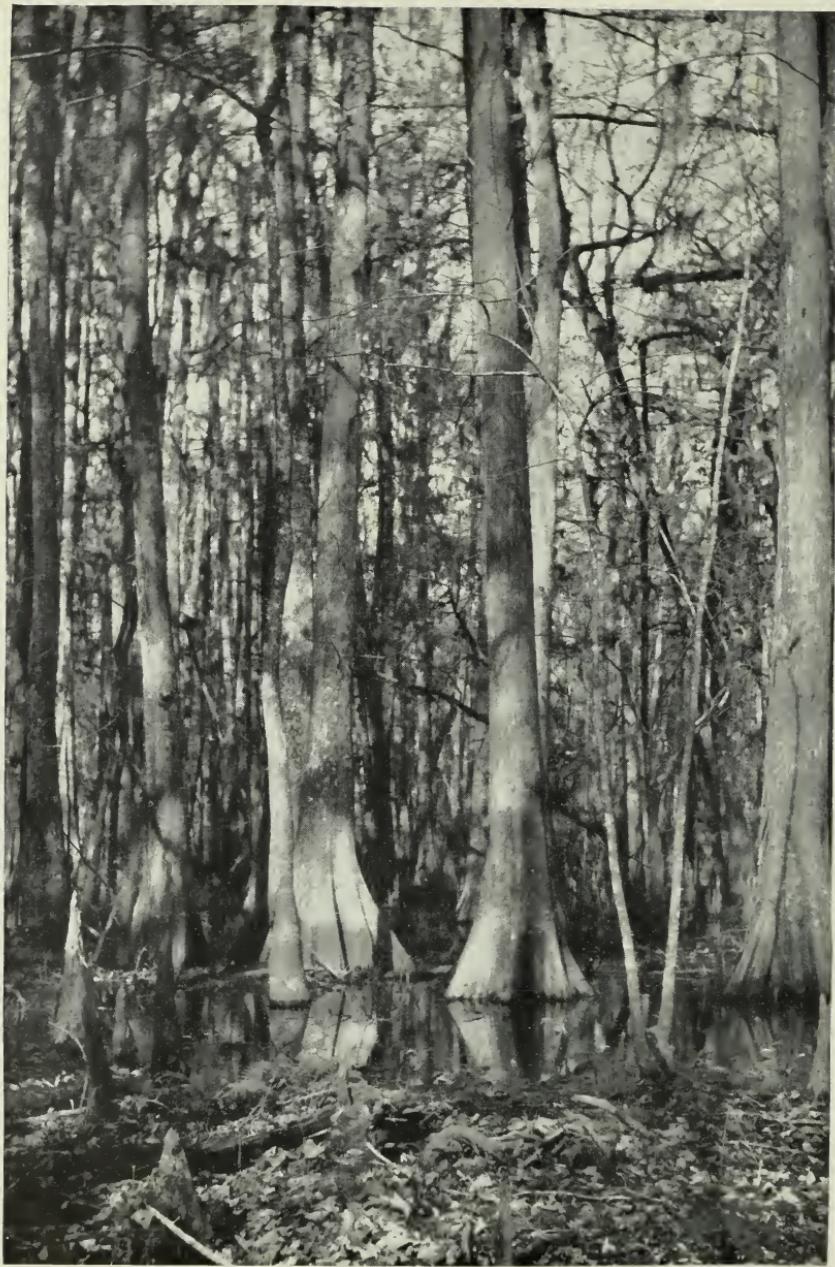


B

TWO IMPORTANT TYPES OF THE CENTRAL HARDWOOD FOREST.

A, On the lower slopes of the Appalachian Mountains the central hardwood forest attains its greatest variety of species, and these reach their highest development here. Yellow or tulip poplar, oak, black walnut, and cucumber trees characterize the forest stand. Formerly chestnut was also abundant. B, In the broad belt between the mountains and the South Atlantic Coastal Plain, white, southern red, scarlet and black oaks, pignut and white hickories, and shortleaf pine are the most abundant trees.

F-6158, F-269123



F-79c85

**SOUTHERN CYPRESS, TUPELO GUM, AND OTHER SWAMP HARDWOODS.**

In the southern forest region one-third of the forest area consists of a mixture of red or sweet gum, water oak, swamp black gum, swamp cottonwood, tupelo gum, and southern cypress.

## CENTRAL HARDWOOD FOREST TREES—Continued

Northern portion—Continued.

Roughleaf hackberry.

Black cherry.

Basswood.

Ohio buckeye.

Eastern red cedar.

Southern portion:

White, post, southern red, blackjack, Shumard red, chestnut, swamp chestnut, and pin oaks.

Red (or sweet) and black gums.

Mockernut, pignut, southern shagbark, and bigleaf shagbark hickories.

Shortleaf and Virginia (scrub) pines.

Green, white, and blue ashes.

Yellow poplar (tulip poplar).

Winged, American, and red elms.

Southern portion—Continued.

Sycamore.

Black walnut.

Silver and red maples.

Beech.

Dogwood.

Persimmon.

Swamp and eastern cottonwoods.

Willows.

Eastern red cedar.

Osage-orange.

Holly.

Texas portion:

Post, southern red, and blackjack oaks.

Mountain and other cedars, and mesquite.

The forests of the region furnish large quantities of high-grade hardwood lumber which has constituted the raw material for wood-manufacturing industries in many States, especially Ohio, Indiana, Michigan, and North Carolina. Memphis, Tenn., has for many years been the largest center for hardwood lumber in the country.

Much high-grade hardwood lumber is shipped from this region to other parts of the United States or to foreign countries. White and red oaks, tulip or yellow poplar for many uses; black locust, red cedar, and chestnut for fence posts, grape stakes, and poles; black walnut for radio cabinets and other kinds of furniture; and ash for athletic and sporting goods and implement handles. Much of the cut of all classes of timber, including saw logs, crossties, piling, poles, and pulpwood, has been obtained from farm woods.

This is a region of great agricultural areas with woodlands forming from 10 to 15 percent of the total lands in farms in Ohio, Indiana, and Illinois, 30 percent in Tennessee, and 40 percent in Arkansas (based upon 1930 United States census). Lumber companies and others have large holdings in the rough and more inaccessible parts of the region.

Three types, or natural associations, of important tree species prevail in the region, with the following approximate acreages in each type: Oak-hickory type, about 44,342,000 acres, oak-chestnut-yellow poplar type, 52,459,000 acres, and the oak-pine type, 35,575,000 acres. This makes a total area of 132,376,000 acres of forest land in the region.

## SOUTHERN FOREST REGION

The yellow pine forests of the Southeastern States afford the only remaining important source of large timber production in the eastern half of the United States. Interspersed with the pine-bearing lands are extensive river and creek bottom lands and swamps in which are growing stands of mixed hardwoods and southern cypress. The region covers the Atlantic and Gulf Coastal Plains from eastern Maryland to eastern Texas, including portions of Missouri, Arkansas, and Oklahoma (fig. 7). The natural conditions are a soil of relatively low agricultural value, abundant rainfall, long growing season, and many species of trees of high commercial importance. The area is the largest of the natural forest regions, with a total of 149,439,000

acres, made up of 126,027,000 acres of southern pines and 23,412,000 acres of wet-land hardwoods and cypress (pl. 6). It embraces about 30 percent of the total forest lands of the country.

Four species of pines, namely, shortleaf, loblolly, longleaf, and slash, make up the bulk of the stands (pl. 7). These are mentioned in the order of their prevalence in passing from north to south across the region. Shortleaf pine is found over an extensive region from New Jersey south to Florida and west to Missouri, Oklahoma, and Texas. Its best growth is in the broad piedmont or hilly area between the mountains and the Coastal Plain. Loblolly pine grows extensively over the upper Coastal Plain. Mixed loblolly and shortleaf pines occur over a vast area in large timber holdings and on hundreds of thousands of farms. Over two-thirds of the total naval stores (spirits of turpentine and rosin) of the world is derived from the crude gum or resin of longleaf and slash pines growing in the southeastern part of the United States. The bulk of production centers in southern Georgia and northern Florida. During the past few years, the amount produced yearly has averaged about 600,000 casks of turpentine (50 gallons each) and about 2,000,000 barrels of rosin (500 pounds each), together valued at about \$17,000,000.

Three other pines make a slight addition to the total amount; namely, the pond pine (a close relative of the pitch pine of the East) in the acid lands and swamps of the Atlantic Coastal Plain; the sand pine of the sand barrens of Florida; and the spruce pine, a tree which, although it is not a white pine, somewhat resembles the northern white pine in appearance of the bark, color of the foliage, and softness of the wood.

The southern pines yield the bulk of the total timber cut from the region (lumber and other timber products), which has ranged mostly from 6 to 12 billion board feet of lumber and 1½ million cords of pulpwood yearly, besides large quantities of railroad ties, piling, and fuel wood (pl. 8). About half of this, it is estimated, was cut from stands of second-growth or comparatively young trees. The lumber cut of the South alone is about one-third of the total for the United States.

The lowland and swamp hardwoods, southern cypress, and an intermittent fringe of southern white cedar cover about one-third of the total area of the southern forest region. The prevailing hardwood trees are red (or sweet) gum, swamp black gum, and tupelo gum, willow oak, water oak, cottonwoods, willows, magnolias, and bays. The red (or sweet) gum occurs over an extensive area, grows rapidly, and holds a high position with respect to quantity cut annually and total value. The large size of the tree and the interlocked fiber of the wood make it one of the leading veneer woods of the country. Only a relatively small amount of the once abundant and highly useful cypress is left; when logged it does not come back abundantly as do the pines.

The prevailing trees, which compose the forests of the two divisions of the Southern region, follow in the order of their relative importance:



*A*



*B*



*C*

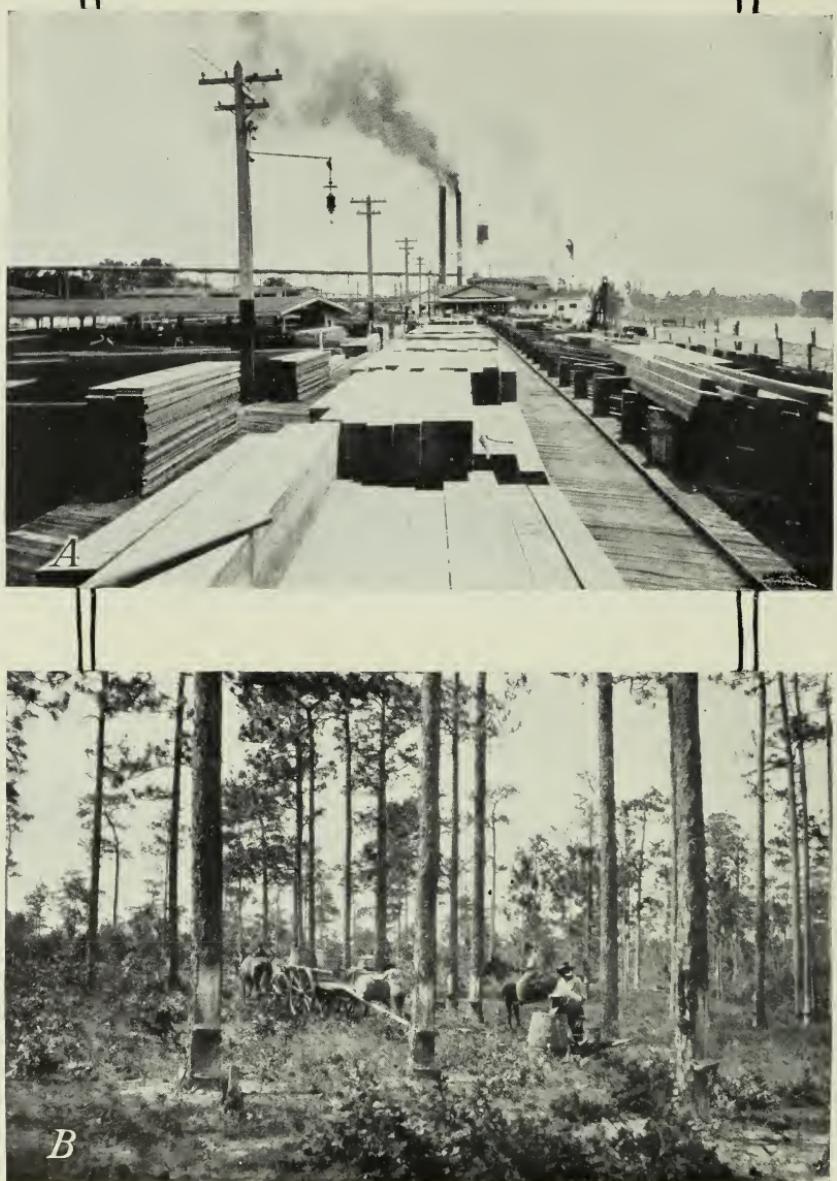


*D*

F-230974, F-269920, F-266872, F-214142

FOUR TIMBER PINES OF THE SOUTHERN FOREST.

*A*, Longleaf pine. *B*, Shortleaf pine. *C*, Slash pine. *D*, Loblolly pine.



F-19967A, F-165320

## FOREST INDUSTRIES IN THE SOUTHERN FOREST REGION.

A. The yearly cut of southern pines exceeds that of any other species or group, amounting to more than 3 billion feet of lumber, 1½ million cords of pulpwood, and many other products. B. Longleaf and slash pines yield crude resin from which turpentine and rosin are obtained. Two-thirds of the world's production come from these trees in the southern forest region.

## SOUTHERN FOREST TREES

Pinelands:	Hardwood bottoms and swamps—Con.
Longleaf, shortleaf, loblolly, and slash pines.	Pecan, water, swamp pignut, and hammock hickories.
Southern red, turkey, black, post, laurel, and willow oaks.	Beech.
Red gum (sweetgum).	River birch.
Winged, American, and cedar elms.	Water, green, pumpkin, and white ashes.
Black, red, sand, and pignut hickories.	Red and silver maples.
Eastern and southern red cedars.	Cottonwood and willows.
Pond and sand pines.	Sycamore.
Hardwood bottoms and swamps:	Sugarberry (southern hackberry).
Red or sweet, tupelo, and swamp black gums.	Honeylocust.
Water, laurel, live, overcup, Texas red, and swamp chestnut oaks.	Holly.
Southern cypress.	Red, white, and sweet bay.
	Evergreen magnolia.
	Pond and spruce pines.
	Southern white cedar.

## TROPICAL FOREST REGION

Two fringes of forest, made up chiefly of tropical tree species, occur along the coast in extreme southern Florida and in extreme southern coastal Texas. The total area involved is probably not over 400,000 acres and the stand of trees varies greatly in density. Many kinds of hardwood trees, most of which are small and bear evergreen leaves and pulpy berries or stone fruit, make up the stand. A few are of some commercial or economic importance, like mastic or "wild olive", and the mangrove, whose impenetrable thickets hold the muddy banks, causing land to be built up, and form a protection against tropical hurricanes. The trees represent the northernmost extension of their natural ranges, which mostly include some or all of the West Indies, Bahamas, Central America, and South America. They have probably sprung from seeds washed ashore during storms or distributed by birds.

The principal trees in this forest region are:

## TROPICAL FOREST TREES

Mangrove.	Gumbo limbo.
Royal and thatch palms.	Poisonwood.
Florida yew.	Inkwood.
Wild fig.	Buttonwood.
Pigeon plum.	Mastic ("wild olive").
Blolly.	Jamaica dogwood.
Wild tamarind.	

## ROCKY MOUNTAIN FOREST REGION

Spread over a vast extent of mountains and high plateaus in the central-western part of the United States, the Rocky Mountain forest region reaches from Canada to Mexico, a length of about 1,300 miles, and from the Great Plains west to the great basin of Nevada and eastern parts of Oregon and Washington, a breadth of 800 miles. It embraces over 40 isolated forest areas or patches, some of large size like that in western Montana, northern Idaho, and eastern Washington, and another in Colorado, New Mexico, and Arizona.

Many are relatively small timbered tracts, lying on the ridges and higher mountain plateaus, interspersed with great treeless stretches and sometimes widely scattered in large arid districts, as in parts of Nevada, Utah, and Arizona. As a result, the timber is locally in good demand and valuable for development, as well as for shipping to other points.

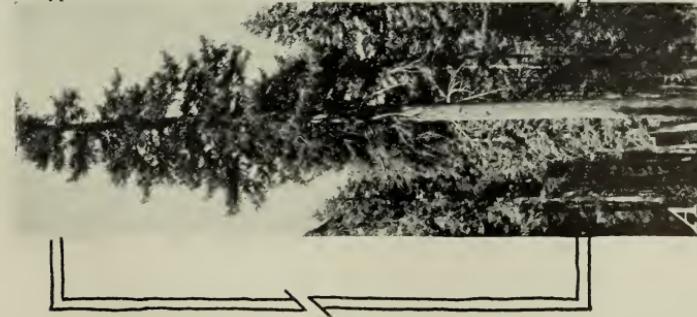
The change in forest cover as one ascends a mountain slope may be illustrated by the successive belts in the southern Colorado-New Mexico forest area. First, at altitudes ranging from 5,000 feet on moister situations to 6,000 feet on drier slopes occurs a belt of one-seeded, alligator, or Utah junipers and pinon, or nut pine; above it ponderosa (western yellow) pine which forms extensive forests over the highly dissected Colorado plateau; with Douglas fir and white fir mingling in the stand in the upper part of the belt, and often so predominating as to form pure stands at 8,000 feet; and finally Engelmann spruce over an extensive horizontal belt terminating at the upper portion at altitudes of 9,000 to 11,000 feet in a belt of alpine fir.

In the northern Montana-Idaho portion of the Rocky Mountain region, forest growth begins at elevations of 3,000 to 4,000 feet and, depending very much upon the exposure and soil moisture, extends upward to 6,500 to 7,000 feet. Limber and western white pine blend at 4,500 feet. The maximum commercial forest growth occurs at about 5,000 feet with limber pine on the dry southern exposures and on the moister or northern slopes Engelmann spruce and alpine fir. Another important tree in the central portion of the region is lodgepole pine, a tall slender tree which grows in dense stands, deriving its name from its use by Indians in making lodges or tepees.

The total area of the many separate divisions or blocks of the Rocky Mountain region amounts to about 62,899,000 acres, or about 13 percent of the total forest land in the United States. The most extensive type is the ponderosa (western yellow) pine, occupying 21,811,000 acres, or about 35 percent of the region. The lodgepole pine type covers about 26 percent or 16,541,000 acres, the western white pine-western larch type about 21 percent or 12,984,000 acres, and the Douglas fir and Engelmann spruce (with some others) about 18 percent or 11,563,000 acres.

The present condition of the Rocky Mountain region is to a very large degree the result of extensive fires set by prospectors in search for outcroppings of gold, silver, or copper ores, over much of the period since the early fifties, and those set by other early pioneers and by tourists who came later. In an earlier day, the Spaniards and their descendants regularly burned over the mountains to get rid of the forest and in its place provide forage for their goats and sheep. Lumbering has been carried on, on a varying scale, as markets have been available during the past 60 years or so, both locally and over the treeless agricultural region to the east.

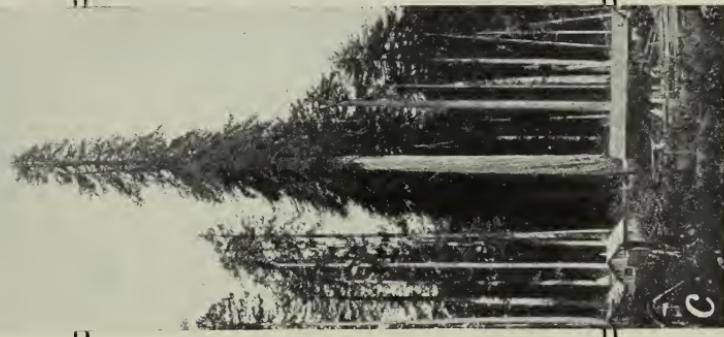
An idea of the composition of the forest in the various parts of the Rocky Mountain region can be gained from the grouping of the trees in the order of their relative importance for each of the northern, central, and southern portions, as follows:



A



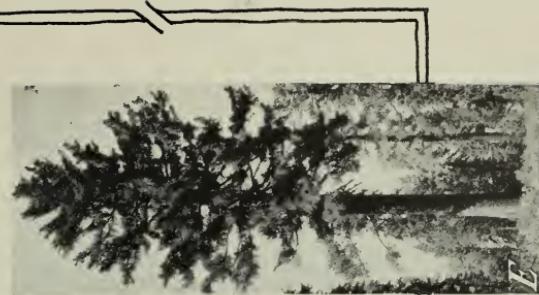
B



C



D



E

F-14262, F-193426, F-94923, F-192397, F-193265

FOREST TREES OF THE WESTERN PART OF THE UNITED STATES THAT PRODUCE LARGE QUANTITIES OF LUMBER.

A, Douglas fir. B, Ponderosa pine. C, Coast redwood. D, Western white pine. E, Sugar pine.



F-48C08

MIXED FOREST OF CONIFERS OF THE NORTHERN PORTION OF ROCKY MOUNTAIN  
AND PACIFIC COAST FOREST REGIONS.

The trees are mostly Douglas fir, with western hemlock, western red cedar, and western white pine.

## ROCKY MOUNTAIN FOREST TREES

Northern portion:	Central Montana, Wyoming, and South Dakota—Continued.
Northern Idaho and western Montana:	Alpine fir. Lodgepole pine. Douglas fir. Western larch. Engelmann spruce. Ponderosa pine. Western white pine. Western red cedar. Lowland white and alpine firs. Western and mountain hemlocks. Whitebark pine. Balsam poplar (Balm-of-Gilead).
Eastern Oregon, central Idaho, and eastern Washington:	Central portion (Colorado, Utah, and Nevada): Lodgepole pine. Engelmann and blue spruces. Alpine and white firs. Douglas fir. Ponderosa pine. Aspens and cottonwoods. Pinon and singleleaf pinon. Rocky Mountain red cedar and Utah juniper. Bristlecone and limber pines. Mountain mahogany.
Oaks and junipers (in Oregon).	Southern portion (New Mexico and Arizona): Ponderosa pine. Douglas fir. White, alpine, and corkbark firs. Engelmann and blue spruces. Pinon and Mexican pinon. One-seeded and alligator junipers and Rocky Mountain red cedar. Aspen and cottonwoods. Limber, Mexican white, and Arizona pines. Oaks, walnut, sycamore, alder, boxelder. Arizona and smooth cypresses.
Central Montana, Wyoming, and South Dakota:	
	Lodgepole pine. Douglas fir. Ponderosa pine. Engelmann spruce.

## PACIFIC COAST FOREST REGION

Stands of very large firs, pines, hemlock, and cedars characterize the Pacific coast forest region. These are dense in the coastal forests of Washington and Oregon. In the extreme southern portion, in southern California, the timbered lands are surrounded with margins of a dense growth of dwarf broadleaf trees known as "chaparral."

The big trees, or Sierra redwoods, of the Sierra Nevada mountains in central-eastern California, reach enormous heights of over 300 feet and diameters up to 40 feet, and single trees contain up to 360,000 board feet of lumber. Another large tree is the coast redwood of the low coastal mountain ranges of central and northern California. One such coast redwood measuring 364 feet in height is reported to be the tallest living tree in the United States. The western red cedar, Douglas fir, and sugar pine of California all grow to heights of over 200 feet with diameters up to 12 to 15 feet (pl. 9). The western red cedar averages the largest of this group. Douglas fir, somewhat smaller, and sugar pine, with its thin rather smooth bark, range mostly from 6 to 9 feet in diameter. About four-fifths of the total standing saw timber of the country is found west of the Great

Plains in the Rocky Mountain and Pacific coast forest regions. The Pacific region, with about one-seventh of the total forest area of the country, contains more than one-half (62 percent) of the total saw timber of the United States, or about 1,042 billion board feet.

One-half of the total standing softwood saw timber (pines, spruces, firs, etc.) in the United States is contained in the two trees, Douglas fir and ponderosa pine, both important in the two western forest regions. Four-fifths of the total Douglas fir (530 billion board feet) is growing in two States, Oregon and Washington, of the Pacific coast region. Ponderosa pine, which ranks second in this country, occurs to the extent of 70 percent of its total amount in the same forest region.

The Pacific coast forest region contains a total of 66,685,000 acres, or about 13 percent, of the total forest area in the country. A forest type dominated by Douglas fir (pl. 10) contains about 27,687,000 acres, and another in which ponderosa (western yellow) pine predominates, 25,070,000 acres. The type consisting mostly of sugar pine and ponderosa pine has 10,183,000 acres, western white pine and western larch an area of about 669,000 acres, spruce and fir about 1,532,000 acres, and the coast redwood and the big tree jointly 1,544,000 acres.

Lumbering operations going forward on a large scale are in fact almost pure engineering. Many of the different trees produce extremely large cuts of clear, useful lumber, much of which is now being delivered by ships to many world ports, some via the Panama Canal to the more important eastern harbors, where it is distributed and sold widely in competition with local lumber.

The important or more common trees in the two natural divisions of the region are:

#### PACIFIC COAST FOREST TREES

Northern portion (western Washington and western Oregon):

- Douglas fir.
- Western hemlock.
- Lowland white, noble, and silver firs.
- Western red cedar.
- Sitka and Engelmann spruces.
- Western white pine.
- Port Orford and Alaska cedars.
- Western and Lyall larches.
- Lodgepole pine.
- Mountain hemlock.
- Oaks, ash, maples, birches, alders, cottonwood, madrone.

Southern portion (California):

- Ponderosa and Jeffrey pines.
- Sugar pine.
- Redwood and bigtree.
- White, red, lowland white, and Shasta red firs.
- Incense cedar.
- Douglas fir.
- Lodgepole pine.
- Knobcone and digger pines.
- Bigcone spruce.
- Monterey and Gowen cypresses.
- Western and California junipers.
- Singleleaf pinon.
- Oaks, buckeye, laurel, alder, madrone.

#### FORESTS OF ALASKA

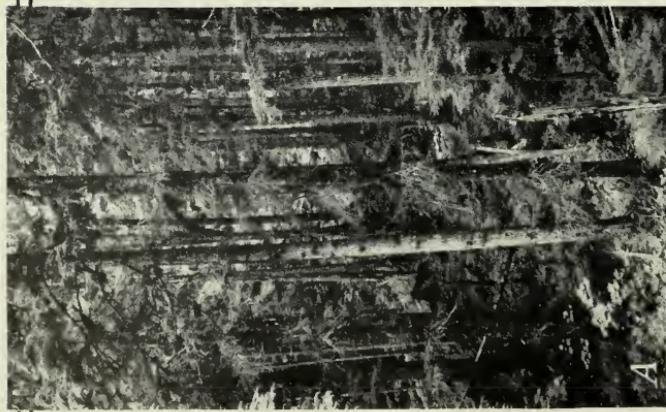
Along the southeastern coast of Alaska for more than 1,000 miles stretches a gradually narrowing belt of dense forest made up of trees of good sizes and commercial species. This is the most northern extension of the mixed coniferous forest found in Oregon, Washington, and British Columbia. About three-fourths of the total stand of timber consists of western hemlock and the remainder mostly of Sitka spruce, with small amounts of western red cedar and Alaska



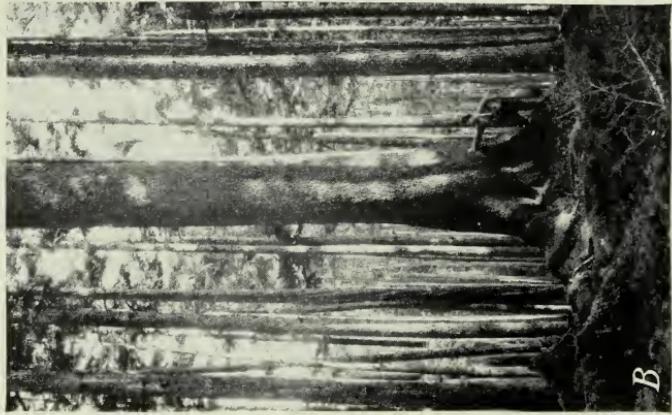
COAST FOREST OF ALASKA.

The coast forests are a continuation of the Oregon-Washington forest belt in which some of the species have dropped out. The forest belt is confined between the sea and an elevation of about 1,500 feet, with an average width of 2 to 3 miles.

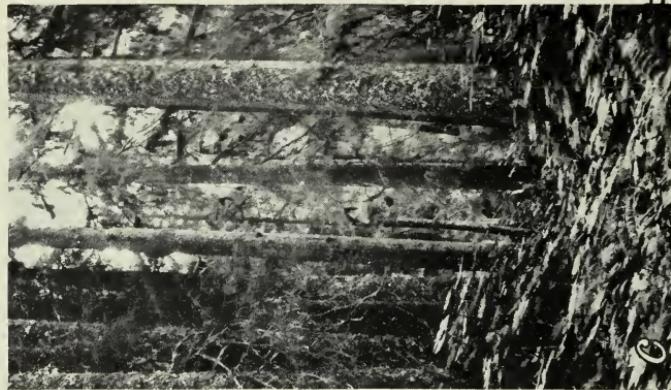
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A



B



C

INTERIOR OF COAST FOREST OF SOUTHERN ALASKA

The forest is dense and consists largely of western hemlock and Sitka spruce, with varying but considerable amounts of western red cedar and Alaska cedar, and a scattering of mountain hemlock. A, Young stand of western hemlock. B, Sitka spruce forest, some trees reaching diameters of 6 to 12 feet and heights up to 200 feet. C, Mixed stand of Sitka spruce and western hemlock.

F=24112A, F=23925A, F=23914A

cedar. Mountain hemlock and lodgepole pine are rarely found. Cottonwood, alders, and willows represent the so-called "hardwood" group. The spruce overtops the other species, and below the main stand of hemlock and some cedar occurs a dense understory of small trees, blueberry, devilsclub, and other shrubs, with a thick forest carpet of moss overlying the ground (pls. 11 and 12).

The total stand of timber is estimated at about 81 billion board feet, of which 78 billion is located within the Tongass National Forest,

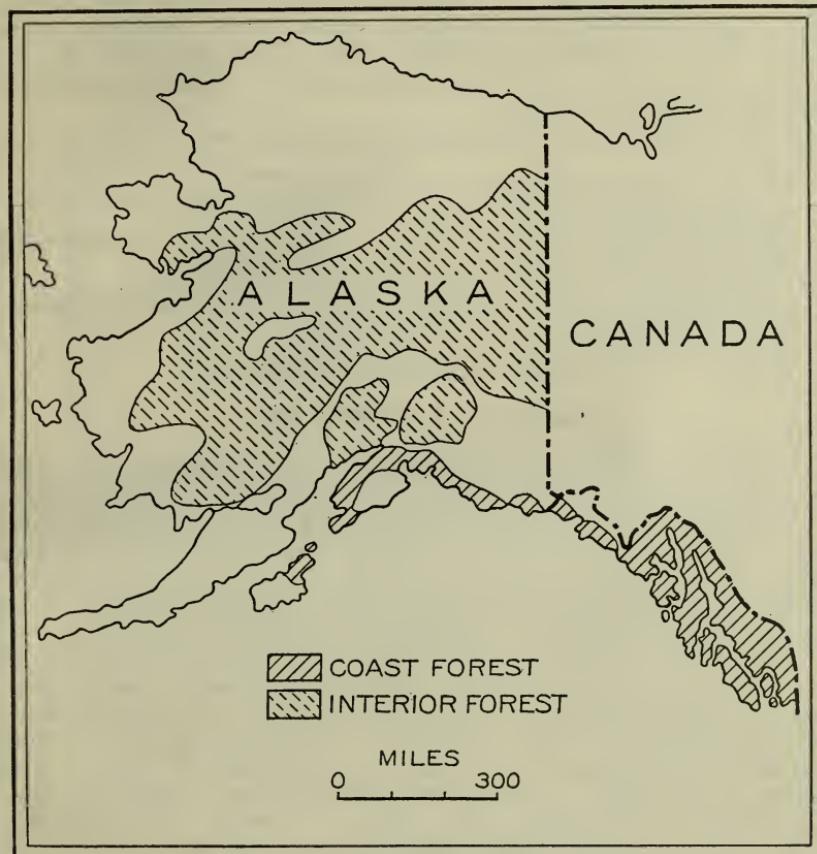


FIGURE 8.—Location and extent of the prevailing forest regions in Alaska.

in the extreme southeastern portion. The latter timber stand covers an area of about 3,000,000 acres, which means an average volume of timber of about 26,000 board feet per acre.

As much as 30,000 to 40,000 board feet per acre occur on many extensive areas, with average maximum stands of 50,000 board feet on small tracts. The merchantable trees range mostly in size from 2 to 4 feet in diameter and from 90 to 140 feet in height, and the bulk of them occur within  $2\frac{1}{2}$  miles of tidewater. This commercial forest belt extends from sea level upward to an elevation of about 1,500 feet, above which it gradually gives way to dwarfed trees and low undergrowth. Further up the coast is the Chugach National

Forest, and the combined area of the two national forests is 21,000,000 acres.

A very different type, known as the "interior" forest, lies mostly within the drainage basins of the Yukon and Kuskokwim Rivers. It is composed of small-sized trees of spruces, birches, and aspens and other poplars which form dense stands over large areas. White spruce is the only tree growing to saw-timber size. Trees which occur in Alaska, but not in continental United States and therefore not listed on pages 5 to 32, include the bigleaf willow (*Salix amplifolia*), feltleaf willow (*S. alaxensis*), Kenai birch (*Betula kenaica*), Alaska white birch (*B. neoalaskana*), and Alaska red birch (*B. eastwoodae*). This type of forest prevails over a vast area estimated at some 80,000,000 acres (fig. 8).

The prevailing trees of the two forest regions are:

Coast forest:

Western hemlock (important).  
Sitka spruce (important).  
Western red cedar.  
Alaska cedar (yellow cedar).  
Mountain hemlock.  
Lodgepole pine.  
Black cottonwood.  
Red and Sitka alders.  
Willows.

Interior forest:

White (important) and black spruce.  
Alaska white (important) and Kenai birches.  
Black cottonwood.  
Balsam poplar (Balm-of-Gilead).  
Aspen.  
Willows.  
Tamarack.

### FORESTS OF PUERTO RICO

The forests of Puerto Rico are tropical and may be divided roughly into wet forest, dry forest, and mangrove swamps, as shown in figure 9. These wet and dry forests are separated by the central mountain range, which causes a heavy rainfall on the north-facing slopes and a great shortage in precipitation on the south side in the southern portion of the island. Forest vegetation culminates in density and luxuriance of growth in the tropical rain forests of the northern and central portions of the island (pl. 13). In the southern portion, the lower mountain slopes, foothills, and coast lands are sparsely covered with an open growth of short-bodied deciduous trees and shrubs. The original forests of the island have largely disappeared through clearing land for agriculture, heavy overcutting of timber, close grazing, and burning. The second-growth forest, although irregular in occurrence, consists of a great variety of species and forest types.

The total forest area is reported to be about 100,000 acres, or about 5 percent of the total land surface, which originally was all in forest growth. This is only one-fifteenth of an acre of forest land for each inhabitant. Saw timber occurs on about 30,000 acres. The Caribbean National Forest, with an area of about 14,000 acres and reaching a climax in forest tree growth at an elevation of 2,000 feet, is being managed on a conservative basis by the Forest Service. There are some 37,000 acres of mangrove swamp of which about 15,000 acres are in insular forest for protection of the coast. The principal forest industry is burning charcoal. The island has no forest products for export; on the other hand, it imports large quantities of lumber and wood products. Only about 10,000 acres of virgin saw-timber forest remain, located on the bottomlands and slopes of the mountains of the national forest, and all rather difficult of access.

In the order of their relative importance or abundance the principal trees are as follows:

Wet forest:

- Roble (*Tabebuia* several species).
- Moca (cabbage bark) (*Andira inermis*).
- Guaraguao (muskwood) (*Guarea guara*).
- Guava (*Inga inga*).
- Guama (*Inga laurina*).
- Tabonuco (incense tree) (*Dacryodes excelsa*).
- Palma de Sierra (mountain palm) (*Euterpe globosa*).

Wet forest—Continued.

- Granadillo (*Buchenavia capitata*).
- Laurel sabino (laurel) (*Magnolia splendens*).
- Capá blanco (*Petitia domingensis*).
- Capá prieto (Spanish elm) (*Cerdena allio dora*).
- Algarrobo (*Hymenaea courbaril*).
- Ausubo (bullet wood) (*Manilkara nitida*).

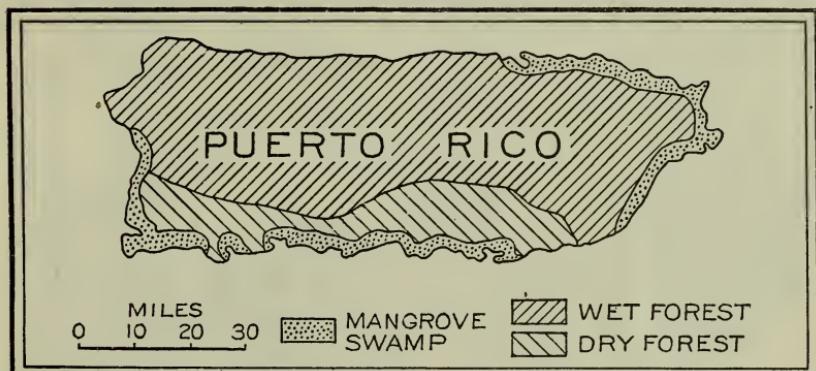


FIGURE 9.—The natural forest regions of Puerto Rico are the wet forest, dry forest, and mangrove swamps.

Dry forest:

- Ucar (*Bucida buceras*).
- Almacigo (West Indian birch) (*Bursera simaruba*).
- Moca (cabbage bark) (*Andira inermis*).
- Guacima (West Indian elm) (*Guazuma ulmifolia*).
- Tea (candlewood) (*Amyris elemifera*).

Dry forest—Continued

- Albarillo (wild quinine) (*Exostema caribaeum*).
- Jobo (hog plum) (*Spondias mombin*).
- Mangrove swamps:
  - Mangle (mangrove):  
(*Rhizophora mangle*).  
(*Conocarpus erectus*).  
(*Avicennia nitida*).  
(*Laguncularia racemosa*).

### FORESTS OF HAWAII

The native forests of Hawaii are tropical in character and consist of wet and dry types (fig. 10). They are found mostly between elevations of 1,500 and 6,000 feet above sea level. The timber forests grow on the coastal plain and lower mountain slopes in districts of very heavy rainfall, and are naturally dense and junglelike. Above them, and extending far up the mountain slopes (to 8,000 feet), is a forest cover of low trees or shrubs of little value for timber, but of high importance for protection against soil erosion and rapid run-off of rain water. No Temperate Zone trees occur naturally, which results in large areas at high elevations without trees of any kind. Below 1,500 feet elevation, where the rainfall is light, the tree growth consists mostly of mesquite (known as "algaraba") which was introduced from southwestern United States as far back as 1828 and

extensively planted for wood and forage for livestock. Various species of eucalyptus, native of Australia, have also been planted and now furnish timber.

The total forest area is a little over a million acres (1,031,840), or about three times as much as the forested land of Delaware or two-thirds as much as that of Connecticut. This is an average of 4 acres to each inhabitant, as compared with 2 acres per capita in continental United States. The forests occur on 7 of the 8 islands making up the Territory and comprise one-quarter of the total land surface. Four-fifths of the forest lands, or about 800,000 acres, have been created as reserves, of which about 560,000 acres are in Government ownership and the balance privately owned. Two-thirds of the total is on the Island of Hawaii, while the remainder is mostly on Kauai and Maui. The present forests are very greatly depleted, largely

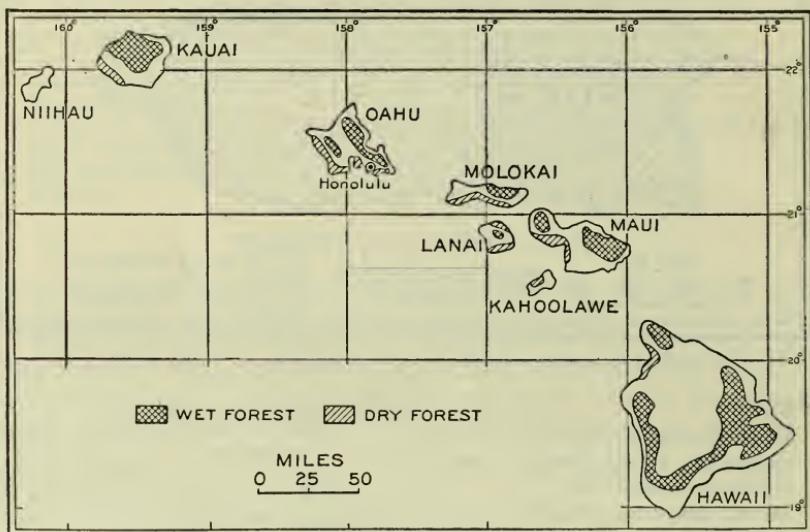


FIGURE 10.—The forests of Hawaii are of the wet and dry types or regions. Forests occur on 7 of the 8 islands.

because of extensive browsing of goats, hogs, and cattle and severe unchecked fires. Prior to 100 years ago the overflow of lava from volcanoes was the only source of destruction to timber. The forests of today do not yield sufficient products for the people, and timber has to be imported.

The forests are composed mainly of five distinct types: Pure growths of ohia lehua, koa, mamane, and kukui, and mixed forests composed largely of the above and koa, koaia, kopiko, kolea, naio, pua, and other trees.

The ohia lehua tree is found extensively in pure stands or with some mixture of other trees, in dense junglelike growth over districts of very heavy rainfall, such as northeastern mountain slopes and tops up to 6,000 feet, as shown in plate 14. This type comprises about three-fourths of the native forest. The tree at its best reaches heights up to 100 feet and trunk diameters up to 4 feet. Koa, known as Hawaiian mahogany, also forms pure stands and occurs widely in mixture with other species. As it is a high-grade cabinet wood used



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VIRGIN TROPICAL FOREST ON MOUNTAIN SLOPES IN PUERTO RICO.

The mountain or Sierra palms here shown are in the Caribbean National Forest.



F-7064

DEEP IN THE FORESTS OF HAWAII.

About three-fourths of the trees in the islands are ohia lehua; those shown here are 90 feet in height. The trail has been cleared through a dense growth of large ferns, shrubs, and vines.

at home and exported, it has been extensively cut. Kukui is an abundant tree, deriving its English name "candlenut" from the oil in the nut, which the natives formerly used for illumination. One or more native species of the true sandalwood, known as "iliahī", have been cut and exported to such an extent that the trees are relatively very scarce.

The first four trees listed below are of much importance in the forest, while the others mentioned are only a few of the 200 or more native species on the islands:

#### HAWAIIAN FOREST TREES

Ohia lehua ( <i>Metrosideros polymorpha</i> )	Pua ( <i>Osmanthus sandwicensis</i> )
Koa (mahogany) ( <i>Acacia koa</i> )	A'e ( <i>Xanthoxylum kauaiense</i> )
Mamane ( <i>Sophora chrysophylla</i> )	Lama ( <i>Maba sandwicensis</i> )
Kukui (candlenut) ( <i>Aleurites triloba</i> )	Alaa ( <i>Sideroxylon auahense</i> )
Koaia ( <i>Acacia koaia</i> )	Iliahī (sandalwood) ( <i>Santalum freycinetianum</i> )
Kopiko ( <i>Straussia oncocarpa</i> )	Algarabā (mesquite) ( <i>Prosopis juliflora</i> )
Kolea ( <i>Suttonia spathulata</i> )	(native of southwestern United States and extensively planted)
Naio (false sandalwood) ( <i>Myoporum sandwicensis</i> )	

#### TREE LABELS

Tree names are of interest to adults but probably even more so to young people. A suitable label on a tree performs a useful service by furnishing ready information to the curious passer-by. Inquiries are frequently received by this Department as to desirable methods of labeling specimen trees. The following method is suggested as simple, attractive, and inexpensive.

The common and scientific names, and if desired also the natural home or range of the tree, are embossed on pieces of aluminum "tape." These are then fastened with zinc or brass brads to small wooden blocks cut from ordinary inch boards. Redwood and southern cypress stand weathering and hold paint well. The blocks should be beveled deeply on the 4 face edges and 2 holes bored 1 above and 1 below the center for taking nails. This allows for considerable growth of the tree without damage to the labels. The blocks are painted black on all sides. A good way might be to dip them in thin paint or dark creosote stain. The dipping can be done quickly by hooking a wire into a hole of one or more of the blocks. If creosote is used it is suggested that the blocks be strung on a wire or cord and soaked for 12 hours. Only galvanized nails should be used, as common nails will cause rust stains. For holding the blocks, tenpenny or twelvepenny nails are suggested, depending on the thickness of the bark, and for fastening the strips on the blocks, brass or galvanized brads. Two suggested designs of tree labels are shown in figure 11.

The size and shape of the blocks will vary with the number of metal strips used or the amount of wording. A narrow margin is suggested since small blocks are more economical, less subject to weather checking, and less attractive as targets. In putting up the labels the nails should not be driven in to the head. This will allow for some growth of the tree without injuring the blocks. A height of 5 to 6 feet up the tree is probably about right for easy reading and for the desired protection.

## PUBLICATIONS ON FOREST TREES

### STATE FOREST-TREE GUIDES

Many States have published popular forest-tree guides, handbooks, or pamphlets describing all or the more abundant native trees. Some include the more common exotic or foreign trees. These guides are very helpful in identifying trees. In the preparation of the text and illustrations of many of them the Forest Service has been a cooperator. The distribution is made wholly by the States, either free or at a nominal cost. Recently a few States have been financially unable to continue distribution, or at least to keep up stock at all times. The names and addresses of the State agencies to whom requests should be sent are indicated by asterisks (\*) in the list printed below. Many

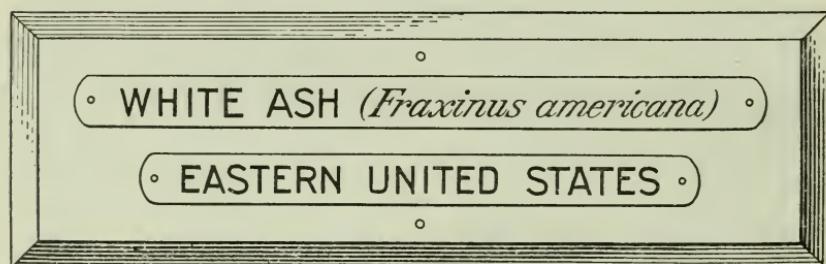
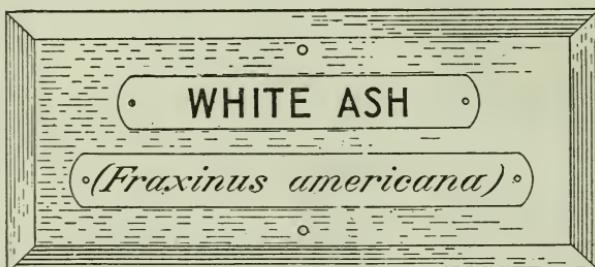


FIGURE 11.—Tree labels made of aluminum strips fastened on painted wooden blocks.

of the other State agencies have tree lists or other information available upon request.

Alabama.—\*State Forester, Commission of Forestry, Montgomery.

Alaska.—\*The Regional Forester, Juneau.

Arkansas.—State Forester, Arkansas Forestry Commission, Little Rock. \*Director, Extension Service, College of Agriculture, Fayetteville.

California.—Chief Forester, Department of Natural Resources, Sacramento.

Connecticut.—\*State Forester, Park and Forest Commission, Hartford.

Delaware.—State Forester, State Forestry Department, Dover. \*Superintendent, Department of Education, Dover.

District of Columbia.—\*Secretary, American Forestry Association, 1713 K Street NW, Washington, D. C.

Florida.—\*State Forester, Board of Forestry, Tallahassee.

Georgia.—State Forester, Department of Forestry and Geological Development, Atlanta. \*Director, Extension Service, College of Agriculture, Athens.

Idaho.—State Forester, State of Idaho, Moscow.

Illinois.—\*State Forester, State Department of Conservation, Springfield.

- Indiana.—State Forester, Department of Conservation, Indianapolis.  
 Iowa.—\*Director, Extension Service, College of Agriculture, Ames.  
 Kansas.—State Forester, State Board of Administration, Hays. \*Secretary, State Board of Agriculture, Topeka.  
 Kentucky.—\*State Forester, State Forest Service, Frankfort.  
 Louisiana.—\*State Forester, Department of Conservation, New Orleans.  
 Maine.—\*Forest Commissioner, State Forest Service, Augusta.  
 Maryland.—\*State Forester, Department of Forestry, Baltimore.  
 Massachusetts.—\*State Forester, Department of Conservation, Boston.  
 Michigan.—Head, Department of Forestry, College of Agriculture, East Lansing.  
 Minnesota.—Director, Department of Conservation, St. Paul. \*Director, Extension Service, College of Agriculture, St. Paul.  
 Mississippi.—State Forester, Commission of Forestry, Jackson. \*Director, Extension Service, State College, Miss.  
 Missouri.—Acting State Forester, Department of Fish and Game, Jefferson City.  
 Montana.—State Forester, Forestry Department, Missoula.  
 Nebraska.—Director, Extension Service, College of Agriculture, Lincoln.  
 New Hampshire.—State Forester, State Forestry Department, Concord.  
 New Jersey.—\*State Forester, Department of Conservation and Development, Trenton.  
 New York.—Director, Lands and Forests, Albany. \*Director, Extension Service, State College of Agriculture, Ithaca. \*Dean, New York State College of Forestry, Syracuse.  
 North Carolina.—\*State Forester, Department of Conservation and Development, Raleigh.  
 North Dakota.—State Forester, State School of Forestry, Bottineau.  
 Ohio.—\*State Forester, Department of Forestry, Wooster.  
 Oklahoma.—\*State Forester, Oklahoma Forest Commission, Oklahoma City.  
 Oregon.—State Forester, State Board of Forestry, Salem.  
 Pennsylvania.—\*Secretary, Department of Forests and Waters, Harrisburg.  
 South Carolina.—State Forester, State Forestry Commission, Columbia. \*Director, Extension Service, Clemson College.  
 South Dakota.—Commissioner, Department of Schools and Public Lands, Custer.  
 Tennessee.—\*State Forester, Division of Forestry, Department of Agriculture, Nashville.  
 Texas.—\*State Forester, Texas Forest Service, College Station.  
 Vermont.—\*Commissioner of Forestry, State Forest Service, Montpelier.  
 Virginia.—\*State Forester, State Forest Service, University.  
 Washington.—State Forest Supervisor, Department of Conservation, Olympia.  
 West Virginia.—\*State Forester, Conservation Commission, Charleston.  
 Wisconsin.—\*Director, State Conservation Commission, Madison.

#### BOOKS ON FOREST TREES

Many books have been published giving popular or technical botanical descriptions of forest trees or native forest shrubs. For information concerning these it is suggested that inquiries be addressed to any of the various State forestry agencies mentioned above or, if desired, to the Forest Service, United States Department of Agriculture, Washington, D. C.

#### FEDERAL PUBLICATIONS

A Check List of the Forest Trees of the United States, Their Names and Ranges (Miscellaneous Circular 92,<sup>17</sup> gives the names of all the known tree species and many of the recognized varieties and hybrids, and their known ranges. They are botanically grouped by genera, families, and classes, but no descriptions of trees are given. Other publications deal with a few individual species and various phases of forest management, including planting, thinning, cutting, and utilization of the products. A list may be requested from the Forest Service, United States Department of Agriculture, Washington, D. C.

<sup>17</sup> This publication is no longer available for distribution, but may be found in the larger libraries.

Motion pictures, film strips, and colored lantern slide sets (accompanied by lecture notes) dealing with many phases of forestry are available for use by responsible public or private agencies, including schools, 4-H clubs, Scouts, and other educational or civic clubs. The conditions are that borrowers pay transportation charges, assume responsibility for damage due to carelessness, and return or forward the borrowed material promptly upon request. Applications should be sent as far as possible in advance, to the Forest Service, or to the Extension Service, United States Department of Agriculture, Washington, D. C.

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