



TREES AND SHRUBS OF THE SOUTHEASTERN
OKLAHOMA PROTECTIVE UNIT*

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Southeastern Oklahoma contains the largest and most varied assortment of woody plant species to be found in any part of the State. This list of 147 species of trees, shrubs, and woody vines of the Southeastern Oklahoma Protective Unit is based upon collections made by the writers during the summer of 1930.

The Southeastern Oklahoma Protective Unit of the Oklahoma Forest Service contains about 2,295,000 acres (1,312,000 acres in 1930) in northern McCurtain, southern LeFlore, and eastern Pushmataha counties. Its southern portion consists of level Coastal Plain with swamps and flood plains along Little River at an elevation as low as 325 ft. The northern

*Contribution from the Oklahoma Forest Service.

part is occupied by the Ouachita or "Kiamichi" Mountains, the highest and most extensive mountains in the State. This section of Oklahoma has the greatest annual precipitation in the State, about 45 in. Due to the high rainfall and wide range of topography and elevation, many of the trees and shrubs from the deciduous forest center in the southern Appalachians are present at their extreme western limits in southeastern Oklahoma and are not found in Kansas, Texas, or northeastern Oklahoma.

In 1930, when the collections were made, the northern boundary of the Unit in LeFlore County was along the top of Winding Stair Mountain and at the base of the north side of Rich Mountain. Rich Mountain, elevation 2,850 ft., is the highest peak in the Ozark region and thus is the loftiest point of the Mississippi Valley between the Appalachian Mountains and the western plains. This important collecting area, including the north slopes of Rich and Kiamichi Mountains, is now within the Ouachita National Forest and the northern boundary of the Unit in 1935 is the crest of Kiamichi Mountain, elevation 2,350 ft. However, this paper will list the species found within the old boundaries, even though a few of these plants of the north sides of the higher mountains may not occur inside the present limits of the Unit.

When eastern Oklahoma (then Indian Territory) was surveyed in the 1890's, records of standing timber were made, and from these notes Fitch² compiled lists of the principal trees by common names for each township. Stevens⁶ collected in southeastern Oklahoma in 1913 while preparing his state flora. Palmer⁵ made a detailed list of the woody plants of Rich and Blackfork Mountains at the north edge of the old boundary of the Unit and emphasized the great display of eastern trees and shrubs. Trees of southeastern Oklahoma were collected also by Clark¹ and included in his unpublished "Aborescent flora of Oklahoma." Members of the Oklahoma Forest Service⁴ have studied the woody plants of southeastern Oklahoma, and a state record of *Symplocos tinctoria*, collected by Frank J. Gibbs in 1933, has been included in this article.

The writers' collection of woody plants of the Southeastern Oklahoma Protective Unit, made in connection with an ecological study to be published later, contained one tree and eight shrub species not previously recorded from the state³. The ligneous flora of 152 species is presented here as an unusually large list for a typically prairie state. The complete set of specimens was placed in the Herbarium of the University of Oklahoma. Duplicates of 60 species were deposited in the Herbarium of the Arnold Arboretum and were determined by C. E. Kobuski, to whom the writers are indebted.

This list is not complete, and several species of the more difficult genera, as well as a few common species, probably are omitted. No attempt was made to collect or list the numerous varieties which are sometimes distinguished. The following 19 species of Palmer's⁵ Rich Mountain list, eight of which belong to the Rosaceae, were not found by the authors: *Carya ovalis* var. *obovatis*, *Castanea ozarkensis*, × ["×" is the times sign, denoting a hybrid.] *Quercus heterophylla*, *Cocculus carolinus*, *Philadelphus pubescens*, *Ribes curvatum*, *Crataegus bracteata*, *C. pagensis*, *C. straminea*, *Prunus munsoniana*, *P. mexicana*, *Rubus occidentalis*, *R. frondosus*, *R. andrewsianus*, *Amorpha fruticosa*, *Rhus trilobata*, *Ilex caroliniana*, *Rhododendron roseum*, and *Lonicera flava*.

As the distribution of species was recorded by associations, the writers' classification of the principal associations here will be summarized briefly. In order to conserve space, associations are referred to by letters from A to I, as indicated below. A small letter is used in forest associations for species of the undergrowth below the canopy. Dominant or common

and characteristic species of an association are designated by double letters (AA, aa, etc.). A letter in parenthesis means that the species occurs infrequently in this association and is neither typical nor common. Records of the largest individuals seen of certain species are given in inches for diameter breast height, and in feet for height. These extremes, although not maximum sizes in all cases, indicate that southeastern Oklahoma has large forest trees, even though most of the State is treeless prairie. The nine state records previously cited by the writers³ and the additional state record of *Symplocos tinctoria*, are designated by an asterisk (*).

The climax vegetation of the Unit is the *Quercus alba* climax forest association (A), a luxuriant deciduous forest of limited extent on the north-facing slopes of the higher mountains and on lower upland slopes near streams. *Quercus alba* is the dominant species, and other characteristic trees are *Tilia floridana*, *Carya alba*, *Quercus shumardii*, and *Acer saccharum*.

The typical hydrarch succession to the climax on silt and gravel flood plains includes the *Nymphaea*, *Zizaniopsis*, *Cephalanthus-Cornus-Salix* shrub (B), *Betula-Salix* (C), and *Liquidambar-Nyssa* flood plain forest (D) associations. The *Cephalanthus-Cornus-Salix* shrub association (B), of such species as *Cephalanthus occidentalis*, *Cornus amomum*, and *Salix longipes*, is especially characteristic of rocky intermittent streams and of gravel flood plains. The *Betula-Salix* association (C) of *Betula nigra* and *Salix nigra* occasionally is present along silt banks of the larger streams, but where *Taxodium distichum* is native, the *Taxodium* association (E) occurs instead. The only flood plain association covering large areas is the *Liquidambar-Nyssa* association (D), a rich forest of large deciduous trees, such as *Liquidambar styraciflua* and *Nyssa sylvatica*.

The usual primary xerarch succession on sandstone consists of the lichen-moss, xerophytic herb, *Rhus* shrub (F), and *Pinus-Quercus* (H) associations, but slight variations occur on novaculite, shale, and rock slides. The *Rhus* shrub association (F) has *Rhus copallina* and *Rhus glabra* as its characteristic species. The *Pinus-Quercus* association (H) occupying nearly all the Unit, is an open forest of *Pinus echinata* with several species of oaks and hickories, such as *Quercus stellata*, *Q. marilandica*, *Q. velutina*, *Q. alba*, *Carya buckleyi* and *C. alba*. On exposed mountain summits the dwarf *Quercus* association (G) of oaks 15 ft. or less in height is found.

After lumbering or burning, the *Pinus-Quercus* association remains essentially the same in composition. The only common additional association of secondary xerarch successions is the *Quercus-Carya* sprouts association (I) of sprouts and seedlings on areas denuded by clearing and cultivation or by very severe fires. Here *Quercus stellata*, *Q. velutina*, *Q. rubra*, *Carya alba*, and *Liquidambar styraciflua* are characteristic.

On the Coastal Plain at the southern edge of the Unit occur two forest associations of which detailed species lists were not made. The *Pinus-Liquidambar* association, a second growth forest of the Coastal Plain, has *Pinus echinata*, *P. taeda* and *Liquidambar styraciflua* as its dominant species. The *Quercus-Carya* association beyond the range of the pines has *Quercus rubra* and *Q. marilandica* as its commonest trees.

For reference the associations designated by letter will be tabulated here:

A	<i>Quercus alba</i> climax forest association.	E	<i>Taxodium</i> association.
B	<i>Cephalanthus-Cornus-Salix</i> shrub association	F	<i>Rhus</i> shrub association.
C	<i>Betula-Salix</i> association	G	Dwarf <i>Quercus</i> association.
D	<i>Liquidambar-Nyssa</i> flood plain forest association.	H	<i>Pinus-Quercus</i> association.
		I	<i>Quercus-Carya</i> sprouts association.

PINACEAE

Juniperus virginiana L. D (F) H. To 21 in. d. b. h. and 40 ft. high.

Pinus echinata Mill. (D) F (G) HH (I). The southern yellow pine or shortleaf pine is the characteristic tree and most important lumber species of the Ouachita Mountains, where it is a dominant species of the pine-oak forest of *Pinus-Quercus* association. It often occurs in pure stands in virgin forests and in secondary successions on old fields and areas where trees have been blown down by windstorms. In places, especially westward and after cutting, it is less common than oaks and hickories. It extends almost to the top of the south-facing slopes of the higher mountains, where it becomes dwarfed and wind-shaped, but is absent at higher elevations of the north-facing slopes, where the *Quercus alba* climax forest occurs. With *Pinus taeda* it is common in the *Pinus-Liquidambar* association or second-growth forest of the Coastal Plain. On favorable sites the average size is about 15 to 18 in. d. b. h. and 80 ft. in height. To 42 in. and 123 ft.

Pinus taeda L. HH. The loblolly pine in Oklahoma is restricted to the Coastal Plain of southeastern McCurtain Co., where it is common in places and has been cut for lumber. It is a dominant species of the *Pinus-Liquidambar* association. To 24 in.

Taxodium distichum (L.) Richard. EE. The baldcypress also is limited in Oklahoma to McCurtain Co., where it is found along Little River and tributaries, mainly in the Coastal Plain. A few trees border streams a short distance north into the Ouachita Mountains. This is the dominant species of the *Taxodium* association at the edges of rivers and ox-bow lakes in flood plains, where mature trees reach 3 to 5 ft. in diameter and 80 to 100 ft. in height. In spite of the fact that this species is at the limit of its range here, a baldcypress is the largest tree in Oklahoma. The Big Cypress is located near Mountain Fork River, about 7 mi. east of Broken Bow, in sec. 7, T. 6 S., R. 26 E. Its dimensions are 9 to 11 ft. d. b. h. and about 110 ft. in height.

GRAMINEAE

Arundinaria gigantea (Walt.) Chapm. ? B d.

LILIACEAE

Smilax bona-nox L. a d h. Also on abandoned fields and a pioneer on sandstone outcrops.

Smilax glauca Walt. a G h. Also characteristic on abandoned fields.

Smilax hispida Muhl. d.

Smilax rotundifolia L. a d h.

Yucca glauca Nutt. ? Uncommon on an upland near Beach Creek.

SALICACEAE

Populus deltoides Marsh. Rare along streams.

Salix humilis Marsh. Uncommon along small streams.

Salix longipes Shuttlew. BB. This shrubby willow is a dominant species of the Cephalanthus-Cornus-Salix shrub association and forms thickets 5 to 15 ft. high, principally on gravel flood plains.

Salix nigra Marsh. CC D. A river bank tree of the Betula-Salix association.

MYRICACEAE

Myrica cerifera L. Moist soil in cutover pine-oak, Coastal Plain (3, 4).

JUGLANDACEAE

Carya alba (L.) K. Koch. AA G HH II. Common in pine-oak forest.

Carya aquatica (Michx. f.) Nutt. D.

Carya buckleyi var. *arkansana* Sarg. G HH II. Common in pine-oak forest.

Carya cordiformis (Wang.) K. Koch. A D.

Carya ovata (Mill.) K. Koch. A. Collected in the *Quercus alba* climax forest of Rich Mountain, but Palmer⁵ did not list it.

Juglans nigra L. A D. To 30 in.

BETULACEAE

Alnus rugosa (Du Roi) Spreng. B. Common in the Cephalanthus-Cornus-Salix shrub association, especially on gravel borders of intermittent streams.

Betula nigra L. CC D. A dominant species of the Betula-Salix association along rivers, where the large trees usually lean over the water. To 27 in.

Carpinus caroliniana Walt. B dd. One of the commonest undergrowth trees of the flood plain forest, where it averages 10 to 15 ft. high but reaches 6 to 8 in. d. b. h. and 30 ft. in height.

Ostrya virginiana (Mill.) K. Koch. a B d G. To 8 in.

FAGACEAE

Castanea pumila (L.) Mill. ? a G.

Fagus grandifolia var. *caroliniana* (Loud.) Fernald. D. The beech has been found at only two localities in Oklahoma, Big Creek in Le Flore Co.⁵ and Beach Creek in McCurtain Co.³ At the latter station it reaches a diameter of 36 in. and a height of about 70 ft.

Quercus alba L. AA D GG HH. The characteristic tree of the climax and common in other mesophytic situations. A large tree up to 45 in. d. b. h. and about 100 ft. high but averaging only 6 in. in diameter and 15 ft. in height in the dwarf oak forest of the exposed mountain summits.

Quercus borealis var. *maxima* Ashe. A D H.

Quercus marilandica Muench. GG HH I. At the top of Kiamachi Mountain, near the lookout tower, elevation 2,350 ft., the plants are extremely dwarfed and average only 4 to 5 ft. high. A characteristic oak of the Quercus-Carya association of the Coastal Plain. To 10 in.

Quercus muhlenbergii Engelm. A D. To 22 in. and 60 ft.

Quercus nigra L. D. To 44 in.

Quercus phellos L. D. Material which perhaps is hybrid, *Q. phellos* × *nigra*, was collected in a pine-oak forest 2 mi. NW. of Page (Little and Olmsted No. 650).

Quercus rubra L. D H II. Common in the Quercus-Carya association of the Coastal Plain.

Quercus shumardii Buckl. AA D H. To 45 in.

Quercus stellata Wang. A G HH II. Common especially in pine-oak forest. On a few flat tops of sandstone ridges where pines are absent, this species occurs in groves known locally as post oak flatwoods. To 22 in. and 50 ft.

Quercus velutina Lam. A GG HH II. To 24 in. and 50 ft. A tree which may be a hybrid, *Q. borealis* × *velutina*, was found in a pine-oak forest on Little Mountain, elevation 1,400 ft., in sec. 16, T. 3 N., R. 24 E., 4 mi N. W. of Muse, Le Flore Co. (Little and Olmsted No. 599).

URTICACEAE

- Celtis laevigata* Willd. A D. To 30 in.
Celtis pumila var. *georgiana* (Small) Sarg. a d. To 20 ft. high.
Maclura pomifera (Raf.) Schneider. d.
Morus rubra L. D. To 14 in.
Planera aquatica (Walt.) J. F. Gmel. D. To 21 in. and 45 ft.
Ulmus alata Michx. D (F) H. To 8 in. and 30 ft.
Ulmus americana L. A D. To 28 in.
Ulmus fulva Michx. A D.

LORANTHACEAE

- Phoradendron flavescens* (Pursh) Nutt. h.

ARISTOLOCHIACEAE

- Aristolochia tomentosa* Sims. d.

POLYGONACEAE

- Brunnichia cirrrosa* Gaertn. d.

MAGNOLIACEAE

Magnolia acuminata L. A. Common locally on Rich Mountain and listed from Kiamichi Mountain by Mattoon, Phillips, and Gibbs⁴. To 12 in. and 60 ft.

Magnolia tripetala L. About six trees up to 6 in. d.b.h. were found at Cucumber Springs on Cucumber Creek, sec. 10, T. 1 N., R. 25 E., Le Flore Co. Perhaps the first authentic record of this species in Oklahoma³, as other reports were doubtful⁵.

ANONACEAE

Asimina triloba Dunal. aa dd. A common undergrowth shrub of the climax and flood plain forests. To 4 in. and 15 ft.

MENISPERMACEAE

- Calycocarpum lyoni* (Pursh) Nutt. d.
Cocculus carolinus (L.) D. C. d.
Menispermum canadense L. a d.

LAURACEAE

- Benzoin aestivale* (L.) Nees. a d.
Sassafras officinale Nees & Eberm. A D G h I. To 8 in. and 40 ft.

SAXIFRAGACEAE

- Hydrangea arborescens* L. a F. Also at base of rock slides.
Itea virginica L. B. Border of ox-bow lake in Coastal Plain.
Ribes cynosbati L. a. Rock slides.

HAMAMELIDACEAE

- Hamamelis macrophylla* Pursh. aa d.
Hamamelis vernalis Sarg., f. *tomentella*. B d. Common in the Cephalanthus-Cornus-Salix association on gravel along intermittent streams.
Liquidambar styraciflua L. DD HH II. The sweet gum is a dominant tree of the Liquidambar-Nyssa flood plain forest and of the Pinus-

Liquidambar forest on cutover areas in the Coastal Plain. Also a common pioneer in abandoned fields. A large tree to 37 in. and 100 ft.

PLATANACEAE

Platanus occidentalis L. C D. To 39 in.

ROSACEAE

- Amelanchier canadensis* (L.) Medic. a B d G h. To 4 in. and 18 ft.
 Several species of *Crataegus* were noted in various habitats, including a d G h. Five species were determined, as follows:
Crataegus aptifolia Michx. h. Also along stream valley.
Crataegus bellica Sarg. Along stream valley.
Crataegus bushii Sarg. h.
Crataegus spathulata Michx. h.
 **Crataegus trianthophora* Sarg. h. A small shrub 3 ft. high but fruiting.
Prunus angustifolia Marsh. d.
Prunus lanata (Sudw.) Mackenzie & Bush. a B h.
Prunus serotina Ehrh. A D G H. To 18 in. and 70 ft.
Rosa setigera Michx. a B.
Rosa subserrulata Rydb. ? a F G h.
 Species of *Rubus* were observed in a d F h and in open areas, such as rock outcrops and clearings. Two were determined as follows:
 **Rubus argutus* Link. Along small stream valley.
Rubus flagellaris var. *invisus* Bailey. a.

LEGUMINOSAE

- Amorpha glabra* Desf. a B. Common along gravel beds of intermittent streams.
Amorpha tennesseensis Shuttlew. B.
Cercis canadensis L. aa d. To 10 in. and 35 ft.
Gleditsia triacanthos L. D.
Robinia viscosa Vent? h. Not reported previously from Oklahoma.
Robinia pseudoacacia L. A D F G H I. A native tree up to 6 in. and 40 ft.

RUTACEAE

- Ptelea trifoliata* L. a d G (h).
Xanthoxylum clava-herculis L. d. Found by members of the Oklahoma Forest Service along Mountain Fork River east of Broken Bow, but not collected by the writers.

MELIACEAE

- Melia azedarach* L. d. The china-tree, common as an ornamental in the Coastal Plain, was found as an escape along Mountain Fork River 7 mi. east of Broken Bow. To 5 in. and 25 ft.

EUPHORBIACEAE

Andrachne phyllanthoides (Nutt.) Muell. Arg. B.

ANACARDIACEAE

- Rhus canadensis* Marsh. h.
Rhus copallina L. a FF G hh I. The dominant pioneer shrub of the *Rhus* shrub association on sandstone outcrops. One of the commonest shrubs of the pine-oak forest, especially where the canopy is open and in cutover forests.
Rhus glabra L. a d FF h I. A pioneer shrub on novaculite knobs and sandstone.

Rhus toxicodendron L. and var. *radicans* (L.) Torr. a B d F hh. Common and widely distributed as a shrub and vine. Also on rock slides.

AQUIFOLIACEAE

Ilex decidua Walt. B d h.

Ilex opaca Ait. D. Common locally in Liquidambar-Nyssa flood plain forest. To 18 in. and 40 ft.

Ilex vomitoria Ait. B d. Known from two stations along streams in McCurtain Co. 3, 4

CELASTRACEAE

Evonymus americanus L. d.

Evonymus atropurpureus Jacq. a.

STAPHYLEACEAE

Staphylea trifolia L. a d.

ACERACEAE

**Acer leucoderme* Small. A. A southeastern sugar maple collected in S. W. part of T. 4 S., R. 25 E., McCurtain Co., for its first Oklahoma record.³

Acer negundo L. D. To 30 in.

Acer rubrum L. and var. *tridens* Wood. A D G H. To 20 in.

Acer saccharum var. *glaucum* Sarg. AA D. Common in the climax forest. To 24 in.

Acer saccharinum L. C D. Occasionally a characteristic tree of river banks.

SAPINDACEAE

Aesculus discolor var. *mollis* Sarg. B.

Aesculus glabra var. *monticola* Sarg. a. To 4 in. and 20 ft.

RHAMNACEAE

Berchemia scandens (Hill) Trel. B d.

Ceanothus americanus L. hh. Common in undergrowth of pine-oak forest.

Ceanothus ovatus Desf. F h.

Rhamnus caroliniana Walt. a d. To 3 in. and 20 ft.

VITACEAE

Cissus arborea (L.) Des Moulins. d.

Parthenocissus quinquefolia (L.) Planch. a d h.

Wild grapes are widely distributed in a d F G h. They are pioneers on rock outcrops and rock slides. These species were collected:

Vitis cinerea Engelm. Collected along small stream.

Vitis cordifolia Michx. a.

Vitis tinsectum var. *glauca* Munson. a.

Vitis rotundifolia Michx. d h.

TILIACEAE

Tilia floridana Small and var. *hypoleuca* Sarg. AA D. To 20 in. and 60 ft.

HYPERICACEAE

Ascyrum hypericoides L. h. Also cleared areas.

Ascyrum stans Michx. Cutover Pinus-Liquidambar forest.

Hypericum oklahomense Palmer⁵. Cutover pine oak forest. Probably the second Oklahoma record³.

Hypericum prolificum L. B d G.

CACTACEAE

Opuntia humifusa Raf. h. Uncommon.

THYMELEACEAE

Dicra palustris L. d. Probably rare and restricted.^{3,5}

ARALIACEAE

Aralia spinosa L. Moist soil Pinus-Liquidambar forest.

CORNACEAE

Cornus amomum Mill. BB. A dominant species of the Cephalanthus-Cornus-Salix shrub association and especially common on gravel and boulders along intermittent streams.

Cornus florida L. aa d G hh. A common undergrowth tree of the more mesophytic forests, where it often forms a lower tree story. To 8 in. and 25 ft.

**Cornus stolonifera* Michx. h. Collected as a state record between Octavia and Ludlow.

Nyssa sylvatica Marsh. A DD G H. A dominant species of the Liquidambar-Nyssa flood plain forest, in which it becomes a large tree up to 37 in. d.b.h.

ERICACEAE

Rhododendron oblongifolium (Small) Millais. B d.

Vaccinium arboreum Marsh. (a) (d) G hh. Common in undergrowth of pine-oak forest.

Vaccinium melanocarpum Mohr. Moist soil in cutover Pinus Liquidambar forest on Coastal Plain.

**Vaccinium neglectum* (Small) Fern. h. Also Pinus-Liquidambar forest.

Vaccinium stamineum L. a F G h.

Vaccinium vacillans Kalm. F g hh. This edible huckleberry is common in the undergrowth of the pine-oak and dwarf oak associations.

**Vaccinium virgatum* Ait. h.

Xolisma ligustrina (L.) Britton. B.

SAPOTACEAE

Bumelia lanuginosa (Michx.) Pers. a d F.

EBENACEAE

Diospyros virginiana var. *platycarpa* Sarg. a B d h I. Common in clearings and abandoned fields. To 8 in.

STYRACACEAE

Halesia monticola var. *vestita* Sarg. a d. To 15 ft. high.

**Styrax americana* Lam. d. Also Pinus-Liquidambar forest.

*SYMPLOCACEAE. Sweetleaf Family

**Symplocos tinctoria* L'Her. Sweetleaf or horse sugar was collected along Yanube Creek east and south of Broken Bow in 1933 by Frank J. Gibbs, of the Oklahoma Forest Service. Here it was a common tree up to 8 in. d.b.h. This state record adds another family to the Oklahoma flora.

OLEACEAE

Chionanthus virginica L. a d G. To 1.5 in and 15 ft.

Fraxinus americana L. A D.

Fraxinus pennsylvanica var. *lancoolata* (Borkh.) Sarg. D.

APOCYNACEAE

Trachelospermum difforme (Walt.) A. Gray. d.

ASCLEPIADACEAE

Vincetoxicum baldwinianum (Sweet) Britton ? Pinus-Liquidambar forest. A slightly woody vine.

VERBENACEAE

Callicarpa americana L. d (h).

BIGNONIACEAE

Catalpa bignonioides Walt. ? d. A rare escape from cultivation and not native.

Tecoma radicans (L) Juss. d.

RUBIACEAE

Cephalanthus occidentalis L. and var. *pubescens* Rafn. BB. A dominant species of the Cephalanthus-Cornus-Salix shrub association along borders of streams and lakes. To 3 in. and 10 ft.

CAPRIFOLIACEAE

**Lonicera prolifera* Rehd. d.

Sambucus canadensis L. a d. Observed on Rich Mountain but not listed by Palmer⁵.

Symphoricarpos orbiculatus Moench. a d.

**Viburnum affine* var. *hypoleucum* Blake. a B d. Noted on Rich Mountain but not listed by Palmer⁵.

Viburnum rufidulum Raf. a d h.

SUMMARY

This list of the trees, shrubs, and woody vines of the Southeastern Oklahoma Protective Unit contains 152 species, a large number for a prairie State. It is based upon collections made by the authors for the Oklahoma Forest Service in the summer of 1930.

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