

**A SURVEY OF THE WOODY FLORA
OF THE STEWART STATE FOREST
STEWART COUNTY, TENNESSEE**

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A SURVEY OF THE WOODY FLORA
OF THE STEWART STATE FOREST
STEWART COUNTY, TENNESSEE

An Abstract
Presented to
the Graduate Council of
Austin Peay State University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

by
Henry Ross Brock, Jr.

August 1969

ABSTRACT

A survey of the woody flora of the Stewart State Forest, Stewart County, Tennessee, was conducted during the 1968 and 1969 growing seasons. Specimens collected were identified and placed on file in the herbarium of Austin Peay State University. From the collections made in this investigation and from previous collections, an annotated checklist of 129 species representing 78 genera and 43 families was prepared. Of these taxa, 29 species representing 20 genera and 17 families were remnants of cultivation.

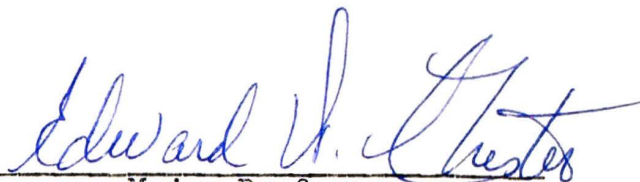
Six species and one variety representing six families are reported from Stewart County for the first time. These include Smilax bona-nox and S. bona-nox var. hastata (Liliaceae), Cladrastis lutea (Leguminosae), Aesculus discolor (Hippocastanaceae), Euonymus atropurpureus (Celastraceae), and Cornus ammomum (Cornaceae).

A comparison of the data with the findings of Clebsch (1957) revealed the presence of a relatively sparse woody flora in the Stewart State Forest. This is attributed to several factors which include differences in the size of the study areas in each investigation and a lack of diverse habitats and a history of timber mismanagement in the Stewart State Forest.


A literature survey was made and observations noted concerning the geology, climate, soils, and history of the study area.

To the Graduate Council:

I am submitting herewith a thesis written by Henry Ross Brock, Jr. entitled "A Survey of the Woody Flora of the Stewart State Forest, Stewart County, Tennessee." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Biology.


Major Professor

We have read this thesis and
recommend its acceptance:


Second Committee Member


Third Committee Member

Accepted for the Council:


Dean of the Graduate School

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I wish to thank Mr. H. O. Anderson, District Forester, Tennessee Department of Conservation, for his kind permission to use the area for study. I thank my fellow students for their accompaniment on field trips and for other aid which they rendered in my behalf. Particularly, I wish to thank Miss Mary Lou McReynolds for her aid in typing the rough drafts.

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I. INTRODUCTION AND LITERATURE SURVEY

Introduction

The Stewart State Forest is an area of uninhabited woodland owned and managed by the Division of Forestry, State of Tennessee and located in Stewart County, Tennessee. As far as could be ascertained, little or no plant collecting has been carried out in the area and no specific studies of the flora or fauna have been conducted. As a preliminary investigation to more detailed ecological studies, it was thought that a knowledge of the woody flora now existing in the area would be beneficial. The data collected will also contribute to our knowledge of the flora of the state.

The purpose of the present study was to collect and identify representatives of the woody flora of Stewart State Forest and from this collection, to prepare an annotated checklist of the species present. In addition to providing data on species diversity, other information, such as the degree of influence by man and present successional trends could be generalized.

In pursuing the investigation, the following questions were tentatively proposed:

1. What species of woody plants occur within the boundaries of the Stewart State Forest?

2. What is the relative abundance of each species?

3. How many of the species presently in the area are indigenous and how many have been introduced?

4. What is the current status of the introduced species with respect to spreading and distribution?

In answering these questions the following procedures were followed:

1. The collection and identification of the woody plants.

2. The study of existing literature and examination of the collections of other workers.

3. The preparation of an annotated checklist of the species present. This annotated checklist includes information on life form, general habitat preference within the Forest, whether the species is native or introduced and if introduced, its present status, and relative abundance. No quantitative data were collected on abundance but it is hoped that visual observations on numerous field trips are sufficient for the data indicated.

In addition, a description of the area is included with data on climate, geology, and soils, all taken from published reports. A historical account is also given and is considered to be only as complete as published accounts and interviews with older local residents and Tennessee Division of Forestry personnel were available.

Literature Survey

Since no data has been published which directly concerns the Stewart State Forest, it was necessary to make use of studies made on the flora of the Middle Tennessee area in which the Stewart State Forest is located. Authors who have published works on the area of Middle Tennessee are: Clebsch (1957), Duncan and Ellis (1969), and Svenson (1925). There are several regional and state guides that are applicable to the woody flora of this area. Ball (1938), Davis (1955), Duncan (1967), Eyles and Robertson (1963), Fernald (1950), Gleason (1963), Gleason and Cronquist (1963), Harrar and Harrar (1946), and Small (1933) authored major regional guides that are frequently used in identifying the plants of the Middle Tennessee area. Their usefulness is limited however, due to the fact that they include all of the species found there. Although several workers have considered segments of the woody flora of Tennessee on a statewide basis, few of these list specimens collected in Stewart County. These include Gattinger (1887, 1901), Hardin (1952), James (1955, 1956), Jennison (1935), Mahler (1968), McGilliard (1955), Robinson and Shanks (1959), Shanks (1952, 1953, 1954), Shanks and Sharp (1950), Svenson (1925, 1941), and Wells and Sharp (1963).

Several guides to the flora of neighboring states have been found helpful in this study. They are: Batson

(1964), Blomquist and Oosting (1959), Jones (1963), Kucera (1961), Radford, Bell, and Ahles (1968), and Winterringer and Lopinot (1966).

II. THE STUDY AREA

Location

The Stewart State Forest comprises 4400 acres of uninhabited woodland in the southeastern part of Stewart County, Tennessee. The elevation of the area ranges from 450 to 600 feet above sea level (Austin, et al., 1953). Stewart County lies within the Western Highland Rim portion of the Interior Low Plateau Physiographic Province (Fenneman, 1938). Braun (1950) includes Stewart County in the Western Mesophytic Forest Region of the Eastern Deciduous Forest Formation. This is a region of mosaic forest communities co-dominated by several hardwood species in each community. Shanks (1958) agrees with Transeau (1953) in his inclusion of parts of Stewart County in the Kentucky Prairie Barrens floristic region in spite of the fact that the Western Highland Rim shares definite floristic affinities with the Southern Appalachians. None of these barrens, however, were observed in the Forest.

The northern boundary of the Forest area extends along a short portion of Tennessee Secondary Road 6114, the Cumberland City Road. Cumberland City is located about four and one-half miles east of the Forest. Dover, the county seat of Stewart County, lies about eight miles to the northwest. The community of Carlisle and South Cross Creek form

the western boundary of the Forest. Elk Creek meanders intermittently along the western side of the study area (Figure 1).

Elk Creek and South Cross Creek form the major drainage systems of the Forest area. These creeks serve as "catch alls" for water which enters them from gullies and ravines that carry the runoff from the higher areas during wet periods. Numerous springs, which empty into one or the other of the two creeks, are also present in the area. This runoff eventually empties into the Cumberland River.

Geology

The Stewart State Forest overlies limestone strata that were deposited as marine sediments during the Mississippian period (Pohl, 1930). This limestone is represented by three different formations, the Warsaw and St. Louis Limestone, and the Fort Payne Chert.

The Warsaw Limestone, the most widespread formation in the Stewart State Forest, may be described as a medium to coarse-grained, yellowish-gray limestone that often contains matted bryozoan fossils. This limestone occurs in massive beds with an average thickness varying from 4 to 8 feet (Bassler, 1932).

The St. Louis Limestone occurs on isolated ridgetops where it overlies the more massive Warsaw formation. The St. Louis is a medium to massive thick-bedded,

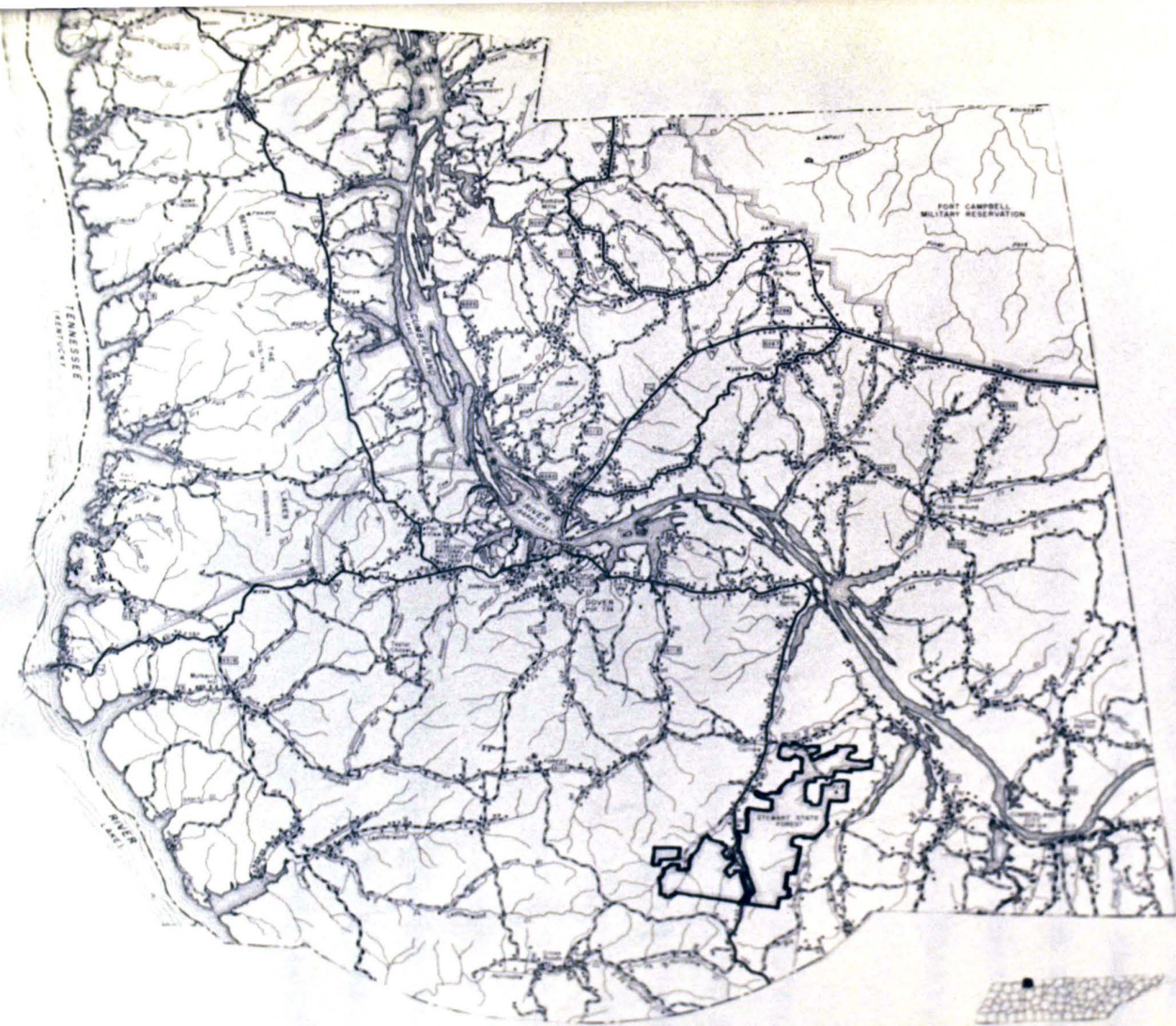


Figure 1. Map of Stewart County Showing
Location of the Stewart State Forest

fine-grained limestone that is generally darker in color than the Warsaw. This formation varies in color from a dusky brown through a series of yellowish-brown shades to a light olive or yellow-gray. Beds of the St. Louis vary in thickness from one to four feet (Bassler, 1932).

The Fort Payne Chert was described by Bassler (1932) as a massive siliceous to argillaceous limestone that weathers into great quantities of blocky yellow chert. This particular chert is characterized by the presence of numerous silicified fossil crinoids. Beds of this chert ranging up to 450 feet in thickness occur in the area (Knott, 1968).

Soils

The soils of the Stewart State Forest, derivatives of parent material weathered from limestone, are red and yellow podzols of the Dickson-Baxter area and vary widely in texture and fertility (United States Department of Agriculture, 1938). These soils also vary in color from almost white to brown on the surface and yellowish-brown to brownish-black in the subsoil. The texture ranges from sandy to silty clay loams. Many of the soils of the area are often highly leached, contain little organic matter, and are generally low in fertility.

Climate

No weather records are directly available for the Stewart State Forest but records from the Dover Weather

Station are considered adequate for describing conditions there.

In general, Stewart County possesses a warm, temperate, continental climate with long warm summers and shorter, open winters (Law, 1954). The average growing season in the area lasts approximately 191 days and extends from April 12 to October 20. The average daily temperature for the past fifty years is 59 degrees F., but extremes have been recorded which range from a maximum of 108 to a minimum of -18 degrees F. (United States Department of Commerce, 1965).

The average annual precipitation during the last 50 years (before 1965) was 48.15 inches. The wettest month of the year is January with an average rainfall of 5.51 inches and the driest month is September with an average of 3.26 inches. Heavy rains occur periodically, often with more than 2.5 inches of water falling in a 24-hour period. Snowfall amounts to about 9 inches annually.

History

In 1797 when the first American settlers came to Stewart County the area was well timbered with a wide variety of trees and was occupied by hostile Indians (Goodspeed, 1886). The eventual defeat and removal of these Indians made the land available for settlement and numerous farms and small communities were established.

The abundance of timber attracted a thriving lumber industry to the area and the early 1800's saw the rise of Stewart County as a center for iron furnaces and rolling mills. Ample timber was available for the manufacture of charcoal to smelt the iron ore and trees were indiscriminately harvested for this purpose (Austin, et al., 1953). In 1828 iron mining was begun in the vicinity of Bear Spring northwest of Carlisle and continued until about 1920 (Miles, 1969). In 1840 the Woods-Veatmann Company established the Carlisle Furnace at the northwestern corner of the area that is now Stewart State Forest (Knott, 1968). Smelting continued there until the furnace was destroyed during the Civil War. This furnace was later rebuilt and ran for several years.

By the twentieth century the higher grade deposits of iron ore were depleted in the area and timber ceased to be plentiful enough for the production of adequate supplies of charcoal. As a result, the Woods-Veatmann Company was forced to terminate operations and abandon their holdings in Stewart County (Wilson, 1969). Most of this property was acquired by the Cumberland Land Company of Clarksville, Tennessee and much of the remaining timber was harvested for the production of railroad crossties (Cole, 1968). This firm experienced financial difficulties in 1934 and declared bankruptcy in 1935. In the bankruptcy proceedings, the State of Tennessee was awarded approximately 4400 acres of

cut-over timberland located near Carlisle in lieu of delinquent taxes. This land became the Stewart State Forest in the Fall of 1935. A prominent citizen of Tennessee Ridge, Mr. G. T. Miles, conducted the original land survey for the State of Tennessee from 1935 to 1937 (Miles, 1969).

It should be noted that at the time of its inception, the Stewart State Forest consisted mostly of heavily timbered woodlands with little previous timber management. Forest fires had been a rather common occurrence. A few old homesites and cultivated fields were also present and exist today in various successional stages. Recently the Division of Forestry has established several small areas of loblolly pine and at least one small plot of tulip poplar. Fire control is rather extensive and except for occasional hunters, the area is rarely visited.

III. METHODS AND MATERIALS

Specimens of woody plants were collected randomly during numerous field trips into the Stewart State Forest throughout the growing seasons of 1968 and 1969. Figure 2 shows some of the materials which were used in the collection and preservation of these plants. Specimens were collected by digging with a small hand trowel in order to obtain entire plants with intact root systems whenever possible or practical. When the size of the plant or its rarity prevented the collection of the entire specimen, a pair of pruning clippers was employed to cut off a selected branch or twig that was representative of the entire plant and would be useful as a record of the presence of that particular species within the Forest.

Each specimen was placed in a plastic bag or vascu-lum for ease in transportation to the herbarium. A record of the location where the plant was collected and the surrounding habitat was entered in a small pocket-size field notebook. This information was transferred to permanent specimen labels for inclusion with the permanent specimens. These permanent labels include the scientific name of the specimen, the name of its collector, the date of its collection, the location from which it came, and general habitat information.



Figure 2. Materials Used in the Collection of the Woody Flora of the Stewart State Forest

Specimens were preserved by standard herbarium procedures and are housed in the herbarium of Austin Peay State University.

IV. ANNOTATED CHECKLIST

The following checklist is a compilation of the data obtained during the collection of woody plants of the Stewart State Forest. Each of the species discussed is listed in phylogenetic order according to Fernald (1950). Scientific names used in this work are also those recognized by Fernald (1950). The data listed for each species include the specific name, colloquial name, relative abundance, habitat conditions, and herbarium numbers.

SPERMATOPHYTA

GYMNOSPERMAE

PINACEAE--Pine Family

Pinus taeda L. Loblolly Pine; Oldfield Pine.

Locally abundant species in cleared areas where it has been introduced. Not native to this area. 03399; 03746.

Pinus virginiana Mill. Jersey, Spruce, Poverty, or Scrub Pine. Rare. Appearing only as an ornamental species around old homesites. 03686; 03750.

Juniperus virginiana L. Red Cedar. Occasionally found growing at edges of old fields and in dry, open woodlands. Seldom found in large numbers. 03479.

ANGIOSPERMAE

MONOCOTYLEDONAE

GRAMINEAE--Grass Family

Arundinaria gigantea var. tecta Scribn. Small Cane; Switch Cane. Locally abundant along streambanks. Often in partial shade. Tends to form cane brakes. 03358.

LILIACEAE--Lily Family

Yucca filamentosa L. Bear Grass; Common Yucca; Silk Grass. Occasional along roadsides, in old gardens, or sometimes cultivated and persisting. 03511.

Smilax bona-nox L. Sawbrier. Common in open fields in full sun. Frequently growing along gravel roadsides. 03705.

Smilax bona-nox var. hastata (Willd.) A.D.C. Hastate-Leaved Sawbrier. Common ground cover on dry, cherty soil along roadsides in full sunlight. Frequent in old fields. 03683.

Smilax glauca Walt. Sawbrier; Wild Sarsparilla. Common woody vines climbing among limbs of shrubs and small trees or sprawling over the ground in dry wooded areas that receive partial to full sunlight. 03429; 03666; 03695.

Smilax rotundifolia L. Common Greenbrier; Catbrier; Bullbrier; Horsebrier. Common large vines inhabiting openly wooded ridges and drier slopes. 04267.

DICOTYLEDONEAE

SALICACEAE--Willow Family

Salix babylonica L. Weeping Willow. Cultivated trees occasionally found growing around old homesites. Rarely escaping cultivation. 03702; 03749.

Salix caroliniana Michx. Ward's Willow. Common around marshy areas in open fields. Often closely associated with the black willow. 03455.

Salix humilis Marsh. Small Pussy Willow; Prairie Willow. Abundant small shrubs growing along wet roadsides and around upland potholes and ponds in full sunlight. 03491; 04255.

Salix nigra Marsh. Black Willow. A fairly abundant shrub or small tree growing along stream courses and around old pond banks. The most common willow species in the area. 03396; 03490; 03898.

Populus alba L. White Poplar; Silver-Leaved Poplar. Occasional around old homesites and along roadsides. An escape from cultivation. 03679.

Populus deltoides Marsh. Cottonwood, Necklace Poplar. Rare. Found growing along open streambanks and in low areas in full sunlight. 03529.

JUGLANDACEAE--Walnut Family

Juglans cinerea L. Butternut; White Walnut. Rare trees restricted to moist, rich lowland woods and creek

bottoms. 03731; 03748.

Juglans nigra L. Black Walnut. Common. In rich lowland woods and along roadsides. Generally absent from drier areas at higher elevations. 03732.

Carya cordiformis (Wang) K. Koch. Bitternut Hickory. Rare. Occurring along streams and in wet areas. 03855.

Carya illinoensis (Wang) K. Koch. Pecan. Rare. Found around old homesites and orchards. 03701.

Carya ovata (Mill) K. Koch. Shagbark Hickory. Common in rich woods, on moist slopes, and in ravines. Generally absent from the drier upland areas. 03711.

Carya tomentosa Nutt. Mockernut Hickory. White-Heart Hickory. Abundant large trees particularly in dry upland woods and ravines. Not common in lower areas on richer soils. 03687.

CORYLACEAE--Hazel Family

Corylus americana Walt. American Hazelnut; Filbert. Common in moist thickets along the borders of woods and streambanks. Absent entirely from the drier areas. 03696.

Ostrya virginiana (Mill) K. Koch. Eastern Hophornbeam; Ironwood. Abundant small trees in moist areas and upland wooded slopes. Rare in drier upland woods. 03740; 03741.

Carpinus caroliniana Walt. American Hornbeam; Blue Beech; Muscle Tree. Frequent along streambanks, on shady slopes, and in moist hollows. 03653.

FAGACEAE--Beech Family

Fagus grandifolia Ehrh. American Beech. Common.

Large trees in rich upland woods and along streambanks. Seldom occurring in drier less fertile soils at upper elevations. 03675; 03892.

Quercus alba L. White Oak. Very abundant throughout the drier upland areas on less fertile soils. Seldom found in rich soils at the bases of slopes and in ravines. 03439.

Quercus coccinea Muench. Scarlet Oak. Frequent in drier upland areas. Seldom seen in ravines or in moist rich woods at lower elevations. 03423.

Quercus falcata Michx. Southern Red Oak. Abundant in dry upland woods. A fairly common species on the poorer soils of the area. Generally absent from the richer lowlands. 03685.

Quercus imbricaria Michx. Shingle Oak. Common in rich dry woods at upper elevations. Lacking in wet lowland woods. 03506.

Quercus marilandica Lam. Blackjack Oak. Fairly abundant as a relatively small tree restricted to the poorer, drier soils of open areas and forest edges. 03535; 03743.

Quercus muehlenbergii Engelm. Chinquapin Oak. A rare tree in the Forest. Known from dry limestone hillsides and rich bottomland woods. 03742.

Quercus palustris Muench. Pin Oak. Rare. Generally restricted to creek basins and streambanks. Absent from dry hollows, ravines, and upland woods. 03424.

Quercus prinus L. Chestnut Oak. Abundant in dry, upland woods and on rocky hillsides. Often in ravines. Absent from moist lowland woods. 03428.

Quercus rubra L. Northern Red Oak. A common tree in both rich and poor soils of drier woodlands. Generally absent from streambanks and moist slopes. 03674.

Quercus stellata Wang. Post Oak. Very common in upland woods and woods edges in areas with relatively poor, sterile soil. Absent from moister, richer low areas. 03708.

Quercus velutina Lam. Black Oak; Yellow-Barked Oak. Rarely found along streambanks and in moist woods. 03537.

ULMACEAE--Elm Family

Celtis laevigata Willd. Sugarberry; Georgia Hackberry. Common small trees growing in hedgerows along open roadsides. Absent from wooded areas. 04278.

Celtis occidentalis L. Hackberry. Common and widespread under many types of conditions. Attains its greatest size near streambanks and in open bottomlands where there is abundant moisture. Absent from the drier upland slopes and ravines. 03715.

Ulmus alata Michx. Wahoo; Winged Elm. Abundant small tree in old fencerows and hedgerows. Occasional understory species in lowland woods. 03680.

Ulmus pumila L. Siberian Elm. Infrequent small trees around old homesites and occasionally escaped in nearby woods. 03533; 03854.

Ulmus rubra Muhl. Slippery Elm; Red Elm. Abundant. The most common species of this genus found in the area. Seldom attains a large size. Mostly growing as small trees in floodplain woods and streambank communities. Rare in drier areas and at higher elevations. 03670.

MORACEAE--Mulberry Family

Morus rubra L. Red Mulberry. Common in rich moist woods. Often becoming a fairly large tree in particularly rich areas. Often found in open areas in fencerows and hedgerows. Absent from drier areas at upper elevations and in dry ravines. 03662; 03857.

Maclura pomifera (Raf.) Schneid. Osage Orange; Hedge Apple. Occasionally found in moist woods and thickets. Most often appearing around old homesites where it is established in fencerows and hedgerows. 03733; 03863.

LORANTHACEAE--Mistletoe Family

Phorandendron flavescens (Pursh) Nutt. American Mistletoe. An occasional parasite on various deciduous trees throughout the area. 03866; 03867.

ARISTOLOCHIACEAE--Birthwort Family

Aristolochia tomentosa Sims. Woolly Dutchmans Pipe.
Rare vines growing along the edges of woods in creek bottom-
lands. Absent from poor soil in dry areas. 04288.

RANUNCULACEAE--Crowfoot Family

Clematis virginiana L. Virgin's Bower. Common vine
in moist thickets in bottomlands and along fencerows.
03734; 03735; 03744.

MENISPERMACEAE--Moonseed Family

Calyccarpum lyoni (Pursh.) Nutt. Cupseed. Occa-
sional large vines ascending small trees and shrubs or
twining through brushy thickets in moist bottomland areas.
03698.

Cocculus carolinus (L.) DC. Coral-bead. Frequent
in flood-plain woods and open areas along stream courses.
Seldom attaining much size as a prostrate vine on the
ground or growing in trees and shrub thickets. 03727.

MAGNOLIACEAE--Magnolia Family

Liriodendron tulipifera L. Tulip-tree; Yellow
Poplar; Tulip Poplar. Abundant. Mostly in rich moist
lowland woods. Relatively common in drier, upland woods.
03422.

CALYCANTHACEAE--Calycanthus Family

Calycanthus floridus L. Sweet Shrub. Carolina Allspice. Strawberry Bush. Rare. Cultivated shrub. Growing around old homesites. Absent from forests. 04280.

ANNONACEAE--Custard Apple Family

Asimina triloba (L.) Dunal. Common Pawpaw. Occasional small trees along shady streams in rich soil. Abundant in floodplain woods. 03707; 03865; 03894; 03895.

LAURACEAE--Laurel Family

Sassafras albidum (Nutt.) Nees. Sassafras. Abundant small shrubs and trees growing primarily in open disturbed areas and along fencerows, frequently found in old field communities. 03397.

Lindera benzoin (L.) Blume. Spice Bush. Common small trees in rich lowland woods along shady streambanks and edges of springs. Lacking from dry sunny areas. 03691.

SAXIFRAGACEAE--Saxifrage Family

Hydrangea arborescens L. Wild Hydrangea. Frequent small shrubs growing along moist, shady bluffs. Restricted to damper uplands. 03471.

HAMAMELIDACEAE--Witch Hazel Family

Liquidambar styraciflua L. Sweet Gum. Frequent large trees restricted to moist lowlands and open areas. Seldom growing in wooded areas. 03661; 03716; 04257.

PLATANACEAE--Sycamore, Planetree Family

Platanus occidentalis L. American Sycamore; Planetree. Common along streams and in open bottomlands. Seldom found growing on dry upland soils. 03669.

ROSACEAE--Rose Family

Physocarpus opulifolius (L.) Maxim. Ninebark. Rare. Large shrubs growing in rich, open bottomlands near streambanks. 04283.

Spiraea thunbergii L. Spirea. Common shrubby remnants of cultivation around old homesites. 03869; 03871.

Pyrus angustifolia Ait. Wild Crabapple. Common. Large shrubs and trees along open roadsides and at woods edges near old fields. Particularly in areas with dry soil of low fertility. 04253.

Pyrus malus L. Apple. Common. In old orchards. Remnants of cultivation. 04279.

Pyrus communis L. Cultivated Pear. Rare. Occurring only around old abandoned homesites and orchards. 03367.

Amelanchier arborea (Michx f.) Fern. Downy Serviceberry; Shadbush. Occasional shrubs or small trees occurring on wooded hillsides and roadbanks. Also found in open fields and hedgerows. 03368.

Crataegus calpodendron (Ehrh) Medic. Hawthorn. Common shrubs and small trees along dry roadsides and in open woods. Absent from moist, dense woodlands. 03657.

Crataegus crus-galli L. Cockspur Hawthorn. Frequent shrubs in open woodlands and waste places, growing under conditions similar to those of the preceding species of this genus. 03681.

Crataegus viridis L. Hawthorn. Common in open upland woods and roadsides, as well as waste places. The most abundant species of this genus in the area. 03682.

Rubus argutus Link. Highbush Blackberry. A very common vine often attaining the size of a medium shrub. Forms thickets in open woods and waste areas around upland sites. 03664.

Rubus flagellaris Willd. Dewberry. Infrequent in dry, open areas. Often found growing as long prostrate canes creeping along open roadsides and waste areas. 03450; 03747.

Rubus occidentalis L. Black Raspberry. Thimbleberry. Abundant thicket former in moist sunlit ravines. 04274.

Rosa carolina L. Wild Rose; Pasture Rose. Abundant in open upland woods and dry soils along roadsides and edges of woods. 03473.

Rosa cathayensis Bailey. Red Multiflora Rose. Rare. Appearing in hedgerows and fencerows around old homesites. Seldom escaping and appearing in open wooded areas. 03509.

Rosa multiflora Thumb. Multiflora Rose. Commonly found in fencerows as an escape from cultivation around old homesites. Forms a thick growth along some roadbanks. 03694.

Rosa odorata Sweet. Cultivated Tea Rose. A single specimen found growing in open woods near an old homesite. 03714.

Prunus angustifolia Marsh. Chickasaw Plum. Abundant thicket-forming small trees in old fields and open woods. 04254.

Prunus americana Marsh. Wild Plum. Common in fencerows, along the edges of woodlands, in waste areas, and old fields. Small trees that tend to form thickets. 03369; 03875.

Prunus hortulana Bailey. Hortulan Plum. Small trees growing in open fencerows. Rare escapes from cultivation. 03688.

Prunus persica (L.) Batsch. Peach. Occasionally found around old homesites and orchards. Often escaping from cultivation. 03370.

Prunus serotina Ehrh. Wild Black Cherry. Small trees commonly growing in rich soil along the edges of woods, in fencerows, and in thickets. 03400.

LEGUMINOSAE--Pulse Family

Gleditsia triacanthos L. Honey Locust. Frequent in clearings, old fields, and along fencerows. Frequently a large tree. 03722.

Cercis canadensis L. Redbud; Judas Tree. Occasional understory shrub or tree of rich upland woods. Lacking in areas with drier, less fertile soil. 03530; 04258.

Cladrastis lutea (Michx.) K. Koch. Yellow Wood. Rare constituent of forests on upland calcareous slopes. Occasional in cultivation. 03723.

Robinia hispida L. Bristly Locust; Clammy Locust. Rarely found persisting as shrubs around old homesites. Seldom occurs in open woods as an escaped ornamental. 03500.

Robinia pseudo-acacia L. Black Locust. Occasional small trees along the edges of open wooded areas and roadbanks. Absent in thick woods and lower areas around water. 03718.

Wisteria frutescens (L.) Purple Wisteria. Frequently persisting as small vines around old homesites. Otherwise uncommon in the Forest. 03505.

Pueraria lobata (Willd.) Ohwi. Kudzu Vine. Locally abundant vines forming dense ground cover around old fields and along open roadbanks. 03672.

SIMAROUBACEAE--Quassia Family

Ailanthus altissima (Mill) Swingle. Tree-of-Heaven. An occasional escape from cultivation found along roadsides, forest edges, and in waste places. 03710.

ANACARDIACEAE--Sumac Family

Rhus glabra L. Smooth Sumac. Abundant shrubs or small trees that may be found in open fields and along roadsides. Mostly in drier habitats. 03521.

Rhus copallina L. Winged Sumac; Shining Sumac. Rare shrubs or small trees found in open fields and along roadsides. Habitat preferences similar to those of Rhus glabra. Does not attain as large a size as Rhus glabra. 03667; 03729.

Rhus radicans L. Poison Ivy. A very common vine which often forms a dense ground cover in cutover areas. Often forms large vines climbing trees in open upland woodlands. 03703.

AQUIFOLIACEAE--Holly Family

Ilex decidua Walt. Deciduous Holly. Rare. Occurring as small trees in moist lowlands and along streams. 1958.

CELASTRACEAE--Staff Tree Family

Euonymus atropurpureus Jacq. Burning Bush; Wahoo. Frequent shrubs in moist lowland thickets and woods. Occasionally appearing on slopes and in moist ravines. Absent from drier upland areas. 03728; 03745.

Euonymus americanus L. Strawberry Bush; Hearts-a-Bursting. Common shrubs occurring in moist lowland thickets

and woods. Often appearing along streambanks just above the water. 03706.

STAPHYLEACEAE--Bladdernut Family

Staphylea trifolia L. Bladdernut. Occasional small trees in floodplain woods and on moist wooded slope. Restricted to moist areas. 03464; 03890.

ACERACEAE--Maple Family

Acer saccharum Marsh. Sugar Maple. Frequent large tree on moist wooded slopes. Generally absent from drier upland areas. Generally an important species of the canopy. 03700; 03864.

Acer saccharinum L. Silver Maple. Rare. Large trees growing in moist, rich lowland woods. 04281.

Acer rubrum L. Red Maple. Common medium sized tree restricted to moist lowland woods. May be quite important in the understory. 03853.

Acer negundo L. Box Elder. Occasional medium sized trees occurring along moist streambanks and in low areas subject to periodic flooding. 03712; 03878.

HIPPOCASTANACEAE--Horsechestnut Family

Aesculus glabra Willd. Ohio Buckeye. Frequent shrubs on rich wooded slopes and bottomlands. Absent from drier areas. 03401.

Aesculus discolor Pursh. Red Buckeye. Rare. Large shrubs. Seldom occurring along shady streambanks. 04259.

RHAMNACEAE--Buckthorn Family

Rhamnus caroliniana Walt. Carolina Buckthorn.

Infrequent shrubs or small trees limited to relatively open, wet lowland woods, moist woody depressions, and along streambanks. 03525.

Ceanothus americanus L. New Jersey Tea. Common small shrubs appearing in relatively open upland woods and along roadsides. 03673.

VITACEAE--Grape Family

Ampelopsis cordata Michx. Raccoon Grape. Occasional vines in most open woods, thickets and along fencerows. 03726; 03852.

Parthenocissus quinquefolia (L.) Planch. Virginia Creeper. Abundant vines in lowland woods and open waste areas. Prefers moister environments where it may form dense ground cover as well as climbing trees. 03658.

Vitis aestivalis Michx. Summer Grape; Pigeon Grape. Abundant vine along the streambanks and in low wet woods. 03660.

Vitis cinerea Engelm. Sweet Winter Grape. Occasional vine along the streambanks and in low wet woods. 03668.

Vitis labruscana Bailey. Cultivated Grape. Seldom found except growing around old abandoned homesites and orchards. Rarely escaping from cultivation. 03692.

Vitis rotundifolia Michx. Muscadine; Bullace Grape. Common in open woodlands and waste areas. Generally preferring moister areas. 03736; 03891.

MALVACEAE--Mallow Family

Hibiscus syriacus L. Rose-of-Sharon; Shrub-Althea. Occasional shrub persisting from cultivation around old homesites. 03737.

NYSSACEAE--Sour Gum Family

Nyssa sylvatica Marsh. Black Gum. Abundant large trees on upland slopes. Generally lacking from drier, less fertile areas. 03720.

ARALIACEAE--Ginseng Family

Aralia spinosa L. Hercule's Club. Occasional shrubs in open upland woods and along dry roadsides. 03690; 03730.

Hedera helix L. English Ivy. Cultivated vine around old homesites. Not found in wooded areas. 03709.

CORNACEAE--Dogwood Family

Cornus florida L. Flowering Dogwood. A frequent small tree of the understory in deciduous upland woods. Frequently in moister areas with relatively fertile soil. 03392.

Cornus ammomum Mill. Swamp Dogwood. Common large shrubs persisting in moist thickets and along streambanks. Seldom found in drier upland areas. 03474.

ERICACEAE--Heath Family

Oxydendrum arboreum (L.) DC. Sourwood. Very rare in the Stewart State Forest. Three small trees growing along a roadside at the northeast edge of the forest. 03717; 03719; 03721.

Vaccinium vacillans Torr. Dryland Blueberry. Occasional small shrubs in dry, upland woods. Particularly abundant on roadbanks. 03540.

EBENACEAE--Ebony Family

Diospyros virginiana L. Persimmon. A frequently occurring tree in old fields, woods, and waste places. Not known in thick woods and wet areas. 03528; 03704.

OLEACEAE--Olive Family

Fraxinus pennsylvanica Marsh. Green Ash. Rare in floodplain woods and along open streambanks. 03671.

Ligustrum vulgare L. Privet. Common shrub forming thickets along roadsides and hedgerows in open areas. An escape from cultivation. 03713.

Forsythia intermedia Zahbel. Yellow Forsythia. Small shrubs persisting around old homesites. May form large thickets. 03689; 03870.

APOCYNACEAE--Dogbane Family

Vinca minor L. Periwinkle; Myrtle. Small common vine found around old homesites. May form extensive ground cover in such areas around old houses. 03684.

SCROPHULARIACEAE--Figwort Family

Paulownia tomentosa (Thumb) Steud. Empress Tree; Princess Tree. An infrequent escape from cultivation in lowland woods. 03738; 03856; 03896.

BIGNONIACEAE--Bignonia Family

Campsis radicans (L.) Seem. Trumpet Creeper; Cow-Itch. Common vine in relatively moist sunny areas though may occur in drier areas. Particularly persistent in disturbed habitats. 03494.

Bignonia capreolata L. Cross Vine. Frequently persisting as vines in rich, moist woods and along bluffs in sunlit areas. Lacking in very shady areas. 1961; 03413; 03851.

Catalpa speciosa Warder. Catalpa; Fishbait Tree. Rare tree seldom appearing around old homesites as a cultivated species. Seldom an escape. 03739.

RUBIACEAE--Madder Family

Cephalanthus occidentalis L. Buttonbush. Abundant small shrubs restricted to low, damp meadows and streams in full sunlight. 03868; 03884; 03887.

CAPRIFOLIACEAE--Honeysuckle Family

Lonicera japonica Thumb. Japanese Honeysuckle. Abundant ground cover (vines) in open waste areas and along fencerows. 03514; 03877; 03880.

Lonicera tartarica L. Tartarian Honeysuckle. A rare cultivated shrub appearing around old homesites and in rocky areas. 03725.

Sambucus canadensis L. Elderberry. Abundant large shrubs scattered along open fencerows. Seldom found in open woods. 03487.

Symphoricarpos orbiculatus Moench. Buckberry; Buckbush; Coralberry. Abundant small shrubs generally growing in large numbers on edges of open woods, in old fields, and in fencerows. 03391.

Viburnum rufidulum Raf. Southern Black-Haw; Rusty Nannyberry. A fairly common shrub or small tree inhabiting dry closed woods and thickets. Absent from moister areas. 03724.

V. DISCUSSION

Based on the collections of other workers, existing literature, and upon the collections of the author, a total of 129 species of woody plants have been identified from the Stewart State Forest. These represent 78 genera belonging to 43 families. Twenty-nine species of cultivated plants representing 20 genera and 17 families are included in these collections.

From comparisons of these data with those of Clebsch (1957), Duncan (1967), McGilliard (1955), and Shanks (1952, 1953, 1954), six species and one variety of woody plants representing six families are reported from Stewart County for the first time. These include Smilax bona-nox and S. bona-nox var. hastata (Liliaceae), Cladrastis lutea (Leguminosae), Euonymus atropurpureus (Celastraceae), Aesculus discolor (Hippocastanaceae), and Cornus ammomum (Cornaceae).

The results of this study indicate a sparse and somewhat limited woody flora in the Stewart State Forest. For comparison, Clebsch (1957) recognized 150 woody species from Montgomery and Stewart Counties. The difference between the number of species found in the two investigations might be attributed to several factors. The study by Clebsch covered an area nearly one million acres in size, while the present study is limited to an area that covers only 4400

acres. The topography of the two-county area is widely varied and ranges from river bottomlands and sloughs to highly dissected upland areas, while that of the Stewart State Forest consists of uniformly dissected upland areas surrounded by small narrow creek basins. Also, the history of poor land management, fires, and the dry, infertile soils of the area probably contribute to the limited flora present.

Killebrew, et al. (1874) warned of the impending dangers that would result from the poor management of the timber in this area:

The timber supply, while adequate at present is being consumed at the rate of 6,000 acres annually. In the neighborhood of old furnaces, it has been cut down for a distance of three or four miles, and used in the making of charcoal. Sprouts put up every year, but the annual fires which sweep over the old "coalings" with devastating fury, destroy them. No new timber is taking the place of the old. Barren, sightless old fields, covered with broomsedge meet the eye on every hand. . . . Were the young timber protected, it would grow as fast as consumed. . . . It is a crime against the material interests of the State, and destructive of one of the finest iron regions of America, to permit the custom of firing the woods to continue. It is a relic of barbarism inherited from savages, and should be stopped by the infliction of pains and penalties.

In this author's opinion, Killebrew's warning was well founded, particularly as far as the area of the Stewart State Forest is concerned. Secondary succession in this area was severely limited up to its acquisition by the State of Tennessee, 34 years ago. At the present time, the more advanced areas are covered by stands of semi-mature hardwoods. If the present rate of succession is allowed to

progress undisturbed, most of the present timber in the Forest should reach maturity within a period of thirty years.

VI. SUMMARY

A survey was conducted of the woody flora of the Stewart State Forest, Stewart County, Tennessee during the 1968 and 1969 growing season. Data for this study were obtained from published records and from the collections obtained by the author during numerous field trips. Information was also gathered on the history, climate, geology, and soils of the area.

The results of this study were:

1. The collection and identification of 129 species of woody plants representing 78 genera and 43 families from the study area. Of these plants, 29 species representing 20 genera and 17 families were found to be remnants of cultivation.
2. Six species and one variety of woody plants were reported from Stewart County for the first time. These represent six families and include Smilax bona-nox, S. bona-nox var. hastata (Liliaceae), Cladrastis lutea (Leguminosae), Euonymus atropurpureus (Celastraceae), Aesculus discolor (Hippocastanaceae), and Cornus ammomum (Cornaceae).
3. The Stewart State Forest encompasses a relatively sparse variety of woody flora. This is probably due to a history of timber mismanagement, fire, a lack of

verse habitats, and the dry infertile nature of the upland
 soils which comprise most of the area.

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