

# Presettlement Vegetation Of The Mackinaw River Valley, Central Illinois

Renee Thomas and Roger C. Anderson  
Department of Biological Sciences  
Illinois State University  
Normal, IL 61761

## ABSTRACT

Government Land Office records were used to determine the presettlement vegetation of a large portion of the Mackinaw River Valley. The vegetation information was placed into four topographic types: flood plain, terrace, slope, and adjacent upland. Within these categories, we distinguished forest and savannah communities from one another based on tree density that was calculated from the witness tree distances. Tree basal area ranged from 14.6 to 42.0 m<sup>2</sup>/ha and tree density ranged from 133.6 to 154.4 trees/ha for the forest communities. By comparison, in the savannah, tree basal area ranged from 0.6 to 1.2 m<sup>2</sup>/ha and tree density ranged from 2.7 to 5.0 trees/ha. White oak was the most important species of the terrace, slope, and adjacent upland categories, while elm, cottonwood, and sycamore were important species of the flood plain.

## INTRODUCTION

In 1784, a commission of the Continental Congress prepared an ordinance for the mode of locating and disposing of the land in the western territory. The plan was established as the Land Ordinance of May 20, 1785. In 1796, work began to survey the lands lying northwest of the Ohio River. Illinois was surveyed during the period 1804 through 1856 (Hutchison, 1988). The area through which the Mackinaw River passes (in what are now the counties of McLean, Woodford, and Tazewell) was surveyed between 1821 and 1833. Most of the work was completed before European settlement had significantly altered the Illinois landscape.

In 1815, a detailed list of "Instructions for Deputy Surveyors" was prepared by E. Tiffin, Surveyor General of the United States. The land was to be divided into squares six miles on a side called Congressional Townships.

Townships were further subdivided into 36 square mile units called "sections." Surveyors were instructed to establish section corners at each mile and quarter section corners at each half mile. From these points, surveyors recorded the courses and distances to the witness or bearing trees. The first witness tree was the closest tree to the corner and a second witness tree was also to be selected, which was opposite to the first tree and adjacent to the corner point. In some instances, only one witness tree was selected and in other cases as many as four trees were chosen. The common name and the estimated diameter of each bearing tree was also recorded. In treeless areas, mounds were raised and posts set to mark corners. At the end of each mile, surveyors also wrote general comments about the character of the land, vegetation, and soil. They also noted natural features that intercepted the survey lines. When streams were encountered, the length, width, and course of the streams were recorded.

Many ecologists believe that the early land survey records provide the most reliable and accurate scientific descriptions of presettlement vegetation that are available. The records are useful from a historical point of view and the information can be applied to future conservation efforts involving restoration or establishment of native vegetation.

Original land survey records have proven to be useful in the determination of original vegetation in several previous studies (e.g., Potzger et al, 1956; Anderson, 1970; Anderson and Anderson, 1975; Delcourt, 1976; Moran, 1978; Rodgers and Anderson, 1979; Leitner and Jackson, 1981; Grimm, 1984; and others). Survey records have also been used to compare presettlement vegetation with present vegetation (Thomson and Anderson, 1976).

In this study, original land survey records were used to determine the presettlement vegetation of a large portion of the Mackinaw River Valley in central Illinois. The river originates near Sibley in Ford County and winds westerly 112 miles (180.4 km) through McLean, Woodford and Tazewell Counties before joining the Illinois River southwest of Pekin (Runkle, 1987). The river falls an average of 3.3 feet per mile (1.0 m/km) and its width ranges from 7 to 125 feet (2.1 to 38.1 m) (Stinauer, 1966).

The majority of the Mackinaw River Valley occurs in the Grand Prairie Natural Division of Illinois (Schwegman, 1973). In this division, forests were generally associated with stream valleys and moraines, while prairie dominated the level to gently rolling landscapes. The Mackinaw River crosses the Bloomington and Shelbyville morainic systems and the narrow plain separating them. The width of the river valley varies from about one-fourth mile (.4 km) at the inner part of the Bloomington belt, to nearly a mile (1.6 km) at the Shelbyville moraine (Stinauer, 1966).

## **MATERIALS AND METHODS**

For section and quarter section points occurring within a quarter mile of the Mackinaw River, witness tree data from the Government Land Office surveys were obtained. Using topographic maps, the elevation of each of these locations was noted, and the points were divided into the following topographic

categories: (1) flood plain (location within the same 10 foot (3.1 meters) contour interval as the river), (2) terrace (location within the next higher contour interval), (3) slope (distinguished by a rapid rise in elevation), and (4) adjacent upland (location on adjacent upland near the river). Topographic maps used in this study included the following 7.5 minute quadrangles: Cooksville, Merna, Lexington, Gridley, El Paso, Secor, Eureka, Mackinaw, Morton, Hopedale, Delavan North, South Pekin, and Pekin. (The Sibley and Colfax quadrangles were not used because neither a well-developed river system nor a flood plain exists near the Mackinaw River at these points.)

From witness tree information provided in the notes, tree species (common name), diameters at breast height, distances, and directions from the section or quarter section corners were recorded. Only the shortest witness tree distance, considered to be the Q1 of the quarter method (Cottam and Curtis, 1956), was used for the computation of the square root of the mean area, because no consistent pattern could be established from the location of the second witness tree after the first witness tree was selected (Rodgers and Anderson, 1979).

Using an estimate of tree density at each section and quarter section point, forest was separated from savannah in each vegetation category based on criteria established by (Anderson and Anderson, 1975). Locations with more than 46.9 trees/ha were considered to be in forest. Locations with more than one tree/2.0 ha but less than or equal to 46.9 trees/ha were considered to be in savannah. The terrace category was not subdivided into forest and savannah communities due to the low number of survey locations occurring in the forest community category.

The quarter method was applied to data for the forest and savannah communities within each vegetation category. Density (trees/ha), relative density, dominance (basal area in  $m^2/ha$ ), relative dominance, frequency, relative frequency, and Importance Values (IV) were calculated for each taxa (Curtis and McIntosh, 1951).

## RESULTS

A total of 140 points were recorded within a quarter mile of the Mackinaw River. For 51 of these points, no witness tree data were given. Twelve points were inaccessible to surveyors due to their occurrence in the Mackinaw River, 30 points had no trees near them, no information was given for one point, and the location of 8 survey points could not be determined due to missing or incomplete section lines on topographic map (8 points). Witness tree data was available for 89 points.

Of the 30 points which listed no trees, 19 points occurred in the flood plain category (16 of these were described by surveyors as prairie), 7 points occurred in the terrace category (5 of these were described as prairie), 1 point occurred in the slope category, and 3 points occurred in the adjacent upland category (1 of these was described as prairie).

Seventeen species of trees were identified from the surveyor's notes to help determine the presettlement vegetation of the Mackinaw River Valley (Table

1). Based on the distributions and habitats of these species, the surveyors' identifications appear to be reasonable. For some genera, such as oak, specific distinctions were made, and for others, such as hickory, ash, and elm, they were not.

For two taxa, overcup oak and s. oak, it was impossible to be certain of the particular species to which the surveyors were referring. Overcup oak is not believed to be *Quercus lyrata* because the range of this species does not presently extend to central Illinois (Mohlenbrock, 1986). However, the surveyors may have misidentified yellow chestnut oak, *Quercus prinoides*, as *Q. lyrata*. Yellow chestnut oak has bark which is similar in appearance to *Q. lyrata* bark. Some of the surveys were conducted when the trees would have been in a leafless condition, making proper identification more difficult. Also, yellow chestnut oak occurs in central Illinois but it was not listed as a witness tree by the surveyors. It is unknown what particular species surveyors were referring to when they noted "s. oak." Shingle oak (*Quercus imbricaria*) or swamp white oak (*Q. bicolor*), both of which occur in moist soil along streams, are possibilities.

The number of tree species was greater on the flood plain (15) than on the upland (4), slope (6), or terrace (7). This was partially the result of more points occurring on the flood plain than in the other communities (Table 2). However, when the average number of species per sampling point was computed, the flood plain (0.38) still had a greater species richness than the slope (0.25) and the adjacent upland (0.25) but not the terrace (0.70). Computing the number of species per point, however, tends to result in higher values for locations with small numbers of sampling points because the number of new species encountered will decrease as the number of sampling points increase.

## COMPARISON OF VEGETATION CATEGORIES AND COMMUNITY TYPES

### Flood Plain

Of the 55 survey points that occurred in the flood plain, 29 percent were located in prairie, and 33 and 38 percent occurred in forest and savannah, respectively.

Based on Importance Values, elm spp. and cottonwood were the leading species in the flood plain forest, and sycamore and white oak had the highest IV in the flood plain savannah (Table 3).

Elm spp. and cottonwood had the highest density in the forest, followed by black walnut and silver maple, respectively. For the flood plain savannah, sycamore had the highest density, followed by elm spp. and cottonwood. Silver maple, white oak, and bur oak ranked fourth, all with the same density (Table 4). Sycamore had the highest basal area in the flood plain forest. In the flood plain savannah, white oak had the highest basal area, and sycamore and overcup oak ranked second and third, respectively (Table 5).

### Terrace

In the terrace category, white oak had the highest importance value, followed by bur oak and black oak as the second and third ranked species, respectively (Table 3). Bur oak had the highest density in the terrace category, followed by white oak and hickory spp. which had the same value (Table 4). White oak had the highest basal area followed by bur oak and black oak (Table 5).

### Slope

White oak had the highest importance value for the forest and savannah of the slope category, with black oak as the second leading species. In the forest, the only other species recorded was sugar maple (Table 3). White oak had the highest density (Table 4) and basal area (Table 5) in the forest and savannah communities, and black oak ranked second in basal area and density in both vegetation categories.

### Adjacent Upland

White oak and black oak had the two highest importance values for the forest and the savannah of the adjacent upland category, with black walnut as the third leading species in the forest, and hickory spp. as the third in the savannah (Table 3). As in the slope vegetation, white and black oak were the first and second leading species, respectively, in density (Table 4) and basal area (Table 5) in the adjacent upland category.

## DISCUSSION

Based upon the results presented, the presettlement vegetation of the Mackinaw River Valley was a mosaic of forest, savannah, and prairie found on flood plains, terraces, slopes, and adjacent uplands. During presettlement times, forested areas in central Illinois generally occurred on more rugged topography associated with river valleys and glacial moraines. Tallgrass prairie dominated on level to gently rolling landscapes (Anderson, 1970; Rodgers and Anderson, 1979) and our data indicates that prairies also occurred in the flood plains.

Fire is thought to have played a major role in determining the presettlement vegetational patterns in central Illinois. Areas of rugged topography were probably more protected from fire than areas with less topographic relief (Wells, 1970; Rodgers and Anderson, 1979; Grimm, 1984; Anderson and Brown, 1986). This allowed forests to survive along moraines and river valleys. Frequent fires on upland sites apparently restricted sugar maple and perhaps other species, such as elm and ash, to areas of rough topography. In the present study, sugar maple was recorded as a witness tree only in the terrace and slope forests. White oak was the dominant species on the uplands in presettlement times, and it still is the dominant canopy tree on uplands in present-day forests. However, as the result of the cessation of fires associated with settlement by Europeans it is apparently rapidly being replaced by sugar maples

and other shade-tolerant, but fire sensitive, mesophytic tree species (Anderson and Adams 1978, Adams and Anderson 1980, Ebinger 1986).

In this study, white oak was the leading species in all vegetation categories except the flood plain, and black oak was second in importance in the slope and adjacent upland categories. Similarly, Rodgers and Anderson (1979) found white oak to be the most important species (and black oak the second) in savannah and forest in the presettlement vegetation of McLean County, Illinois.

Density per hectare for the forest communities ranged from 133.58 in the flood plain to 154.38 on the slope. This was similar to the 159.8 trees/ha reported by Anderson and Anderson (1975) for the presettlement forests of Williamson County. However, for unglaciated southern Illinois Leitner and Jackson (1981) reported slightly higher tree densities ranging from 175.9 trees/ha to 281.4 trees/ha.

Density was much lower for the savannah communities and terrace category than for the forest communities, ranging from 2.72 trees/ha to 8.23 trees/ha. This is fairly consistent with the Rodgers and Anderson (1979) study of the presettlement vegetation of McLean County in which they reported .25 trees/ha and 5.76 trees/ha in the prairie and savannah categories, respectively.

Basal areas of forest communities ranged from 14.63 (flood plain) to 41.97 m<sup>2</sup>/ha (adjacent upland). In a study of the vegetation of the Oakwood Bottoms Greentree Reservoir in southern Illinois, Thomson and Anderson (1976) reported basal areas ranging from 6.1 to 37.0 m<sup>2</sup>/ha. However, in present-day forests in Central Illinois, Adams and Anderson (1980) reported basal areas of 45.4 m<sup>2</sup>/ha for lowland forests and 33.9 m<sup>2</sup>/ha for forest similar to the adjacent upland forests of our study. The low total tree basal area of the presettlement flood plain forest compared to the adjacent upland is the result of a smaller average tree basal area (0.11 m<sup>2</sup>/ha) in the flood plain than in the adjacent upland forest (0.28 m<sup>2</sup>/ha). The reason for the smaller tree size on flood plains in presettlement times compared to present-day forests is not known.

Elm, cottonwood, black walnut, silver maple, and sycamore were found to be important trees of the flood plain. In a study of the presettlement forests of the unglaciated portion of southern Illinois, Leitner and Jackson (1981), found sycamore, cottonwood, ash, and elm to be dominants of the floodplain forest. The present-day flood plain and wet-mesic forests of central Illinois have elm, cottonwood, black walnut, silver maple, and sycamore as important species (Adams and Anderson, 1980). However, white and black oak, characteristic of uplands today and not flood plains, were also present on the flood plain during the original land surveys. Perhaps, the oaks occurred on the ridges within the flood plain, or it is possible the topographic maps do not adequately define the flood plain.

Red oak, bur oak, and Ohio buckeye were noted only in the terrace and/or the flood plain community. In the present-day forests, red oak is a pioneer on mesic sites (Peet and Loucks, 1977) and its distribution extends into dry-mesic and wet-mesic forests. Bur oak is presently found in bottomland woods, in some mesic forests, and also on dry ridges. Ohio buckeye is presently found in wet-mesic and mesic forests and frequently occurs on terraces above the flood plain (Adams and Anderson, 1980).

Surveyors usually recorded general comments about the landscape at the end of each half mile. Prairie was often referred to as "land level and rich" and "fit for cultivation." Flood plain forest was described as "rich bottom timber" or "low wet bottom" in which walnut, buckeye, cottonwood, maple, bur oak, and elm were encountered. Pawpaw was often listed as an understory species. Where the Mackinaw River flows into the Illinois River, surveyors described the area as "swamp." Some of the land was described as "rich timber" with species such as oak and hickory and with the same species as undergrowth shrubs. Much of the adjacent upland was noted as being "thinly timbered with oak and hickory," "rolling second rate barrens," and "broken, not fit for cultivation." Today, much of this land continues to be uncultivated, and some of it remains as forest. Coupled with witness tree data, such notations provide present day ecologists with information which is useful in determining presettlement vegetation.

Our results suggest limitations in using topographic maps with 10 foot (3.1 m) contour intervals to put section and quarter section points into topographic categories that are related to vegetational patterns. This is especially obvious for the flood plain category, where locations with white and black oak were included in the flood plain. It is also possible that even if the section or quarter section point occurred within the flood plain, the closest trees may have been located on an adjacent slope. A refinement of our procedures would be to determine the contour interval of the witness tree location rather than the location of the section or quarter section point.

#### LITERATURE CITED

- Adams, D. and R.C. Anderson. 1980. Species response to a moisture gradient in central Illinois. *Amer. J. Bot.* 67: 381-392.
- Anderson, R. C. 1970. Prairies in the prairie state. *Trans. Ill. State Acad. Sci.* 63: 214-221.
- Anderson, R.C. and D. Adams. 1978. Species replacement patterns in central Illinois white oak forests. p. 284-301. In P. E. Pope (ed.) *Proc. of Central Hardwoods Conf. II*, Purdue Univ., West Lafayette, Indiana.
- Anderson, R.C. and M R. Anderson. 1975. The presettlement vegetation of Williamson County, Illinois. *Castanea* 40: 345-363.
- Anderson, R.C. and L.E. Brown. 1986. Stability and instability in plant communities following fire. *Amer. J. Bot.* 73: 364-368.
- Cottam, G. and J.T. Curtis. 1956. The use of distance measures in phytosociological sampling. *Ecology* 37: 451-460.
- Curtis, J.T. and R P. McIntosh. 1951. An upland forest continuum in the prairie-forest border region of Wisconsin. *Ecology* 32: 476-496.
- Delcourt, H.R. 1976. Presettlement vegetation of the North of Red River Land District, Louisiana. *Castanea* 41: 122-139.
- Ebinger, J. 1986. Sugar maple a management problem in Illinois forests? *Trans. Ill. Acad. of Sci.* 79: 25-30.
- Grimm, E.C. 1984. Fire and other factors controlling the big woods vegetation of Minnesota in the midnineteenth century. *Ecol. Monogr.* 54: 291-311.
- Hutchison, M.D. 1988. A guide to understanding, interpreting, and using the Public Land Survey field notes in Illinois. *Natural Areas Journal* 8: 245-255.
- Leitner, L.A. and M.T. Jackson. 1981. Presettlement forests of the unglaciated portion of southern Illinois. *Amer. Midland Nat.* 105: 290-304.

- Mohlenbrock, R.H. 1986. Guide to the Vascular Flora of Illinois. Southern Illinois Press, Carbondale. 507 p.
- Moran, R.C. 1978. Presettlement vegetation of Lake County, Illinois. p. 12-18 In D. C. Glenn-Lewin and R. Q. Landers, Jr. (eds.) Proceedings of the Fifth Midwest Prairie Conference, Iowa State University. Ames, Iowa.
- Peet, R.K., and O. L. Loucks. 1977. A gradient analysis of southern Wisconsin forests. *Ecology* 59: 1248-1255.
- Potzger, J. E., M.E. Potzger and J. McCormick. 1956. The forest primeval of Indiana as recorded in the original U.S. land surveys and an evaluation of previous interpretations of Indiana vegetation. *Butler Univ. Bot. Stud.* 13: 95-111.
- Rodgers, C.S. and R.C. Anderson. 1979. Presettlement vegetation of two prairie peninsula counties. *Bot. Gaz.* 140: 232-240.
- Runkle, M. 1987. Mad Mack. *Outdoor Highlights* 15: 3-5. Illinois Department of Conservation.
- Schwegman, J.E. 1973. Comprehensive plan for the Illinois Nature Preserves System. Part 2. The Natural Divisions of Illinois. Illinois Nature Preserves Commission, Rockford, IL.
- Stinauer, R. 1966. Inventory of the fishes of the Mackinaw River Basin. Illinois Department of Conservation, Havana, Illinois.
- Thomson, P. M. and R.C. Anderson. 1976. An ecological investigation of the Oakwood Bottoms Greentree Reservoir in Illinois. p. 45-64. In J. Fralish, G. Weaver, and R. Schlesinger (eds.) Proc. First Central Hardwoods Forest Conference. Southern Illinois University.
- Wells, P.V. 1970. Historical factors controlling vegetation patterns and floristic distribution in the central plains region of North America. In W. Dort and J. K. Jones (eds.) Pleistocene and Recent Environments of the Central Great Plains. Univ. of Kansas Special Pub. No. 3, Univ. of Kansas Press, Manhattan, p. 211-221.

Table 1. Tree species identified by surveyors.

---

<i>Acer saccharinum</i> L. (maple)
<i>Acer saccharum</i> Marsh. (sugar tree, sugar maple)
<i>Aesculus glabra</i> Willd. (Ohio buckeye)
<i>Carya</i> Nutt. spp. (hickory)
<i>Celtis occidentalis</i> L. (hackberry)
<i>Fraxinus</i> L. spp. (ash)
<i>Juglans nigra</i> L. (black walnut)
<i>Morus rubra</i> L. spp. (mulberry)
<i>Platanus occidentalis</i> L. (sycamore)
<i>Populus deltoides</i> Marsh. (cottonwood, cottontree)
<i>Quercus alba</i> L. (white oak)
<i>Quercus macrocarpa</i> Michx. (bur oak)
<i>Quercus rubra</i> L. (red oak)
<i>Quercus</i> L. spp. (overcup oak*, s. oak)
<i>Quercus velutina</i> Lam. (black oak)
<i>Ulmus</i> L. spp. (elm)

---

\*Overcup as described by the surveyors may be *Quercus prinoides* Willd., and s. oak may be *Q. bicolor* Willd. or *Q. imbricaria* Michx.

Table 2. Information about different vegetation categories of the Mackinaw River Valley

	<u>Flood plain</u>		<u>Terrace</u>	<u>Slope</u>		<u>Adjacent Upland</u>	
	<u>Forest</u>	<u>Savannah</u>		<u>Forest</u>	<u>Savannah</u>	<u>Forest</u>	<u>Savannah</u>
Number of tree species	12	11	7	3	5	3	3
Total number of trees	33	30	16	13	25	16	17
Number of points	18	21	10	8	16	7	9
Density (trees/ha)	133.58	2.70	8.22	154.38	4.98	150.05	4.74
Mean tree basal area (m <sup>2</sup> )	0.11	0.22	0.24	0.10	0.17	0.28	0.25
Basal area (m <sup>2</sup> /ha)	14.63	0.59	1.93	16.07	0.84	41.97	1.18

Table 3. Importance values for the vegetation of the Mackinaw River Valley

	<u>Flood plain</u>		<u>Terrace</u>		<u>Slope</u>		<u>Adjacent Upland</u>	
	<u>Forest</u>	<u>Savannah</u>	<u>Forest</u>	<u>Savannah</u>	<u>Forest</u>	<u>Savannah</u>	<u>Forest</u>	<u>Savannah</u>
Elm	52.9	41.3	-	-	-	-	-	-
Cottonwood	45.5	32.4	-	-	-	-	-	-
Black walnut	38.7	15.7	-	-	-	-	25.5	-
Silver maple	34.3	30.9	-	-	-	-	-	-
Sycamore	33.8	49.6	-	-	-	-	-	-
White oak	29.4	46.8	74.3	-	189.5	198.5	205.0	180.7
Ash	17.5	8.1	-	-	-	10.3	-	-
Black oak	11.6	-	48.0	-	78.8	49.1	69.5	90.0
Ohio buckeye	9.8	8.9	15.9	-	-	-	-	-
Hickory	9.8	-	42.6	-	-	20.0	-	29.3
Hackberry	9.1	-	-	-	-	-	-	-
Mulberry	7.5	-	-	-	-	-	-	-
Overcup Oak	-	25.0	-	-	-	22.1	-	-
Bur oak	-	25.0	62.9	-	-	-	-	-
S. oak	-	16.4	-	-	-	-	-	-
Sugar maple	-	-	26.7	-	31.7	-	-	-
Red oak	-	-	29.5	-	-	-	-	-
TOTAL	299.9	300.1	299.9	300.0	300.0	300.0	300.0	300.0

Table 4. Density (trees/ha) for the vegetation of the Mackinaw River Valley

	<u>Flood plain</u>		<u>Terrace</u>		<u>Slope</u>		<u>Adjacent Upland</u>	
	<u>Forest</u>	<u>Savannah</u>	<u>Forest</u>	<u>Savannah</u>	<u>Forest</u>	<u>Savannah</u>	<u>Forest</u>	<u>Savannah</u>
Elm	24.29	0.36	-	-	-	-	-	-
Cottonwood	24.29	0.36	-	-	-	-	-	-
Black walnut	20.24	0.18	-	-	-	-	9.38	-
Silver maple	16.19	0.27	-	-	-	-	-	-
Sycamore	12.14	0.45	-	-	-	-	-	-
Ash	8.09	0.09	-	-	-	0.20	-	-
White oak	8.09	0.27	1.54	95.0	103.16	3.18	2.51	-
Hackberry	4.05	-	-	-	-	-	-	-
Ohio buckeye	4.05	0.09	0.51	-	-	-	-	-
Black oak	4.05	-	1.03	35.64	37.51	0.80	1.67	-
Mulberry	4.05	-	-	-	-	-	-	-
Hickory	4.05	-	1.54	-	-	0.40	0.56	-
Overcup Oak	-	0.18	-	-	-	0.40	-	-
S. oak	-	0.18	-	-	-	-	-	-
Bur oak	-	0.27	2.06	-	-	-	-	-
Sugar maple	-	-	0.51	23.74	-	-	-	-
Red oak	-	-	1.03	-	-	-	-	-
TOTAL	133.58	2.70	8.22	154.38	150.05	4.98	4.74	-

Table 5. Basal area (m<sup>2</sup>/ha) for the vegetation of the Mackinaw River Valley

	<u>Flood plain</u>		<u>Terrace</u>		<u>Slope</u>		<u>Adjacent Upland</u>	
	<u>Forest</u>	<u>Savannah</u>	<u>Forest</u>	<u>Savannah</u>	<u>Forest</u>	<u>Savannah</u>	<u>Forest</u>	<u>Savannah</u>
Sycamore	2.44	0.10	-	-	-	-	-	-
White oak	2.25	0.15	0.59	10.93	0.64	0.87	30.48	0.87
Cottonwood	2.25	0.04	-	-	-	-	-	-
Elm	2.16	0.07	-	-	-	-	-	-
Silver maple	2.08	0.05	-	-	-	-	-	-
Black walnut	1.11	0.01	-	-	-	-	4.27	-
Black oak	0.67	-	0.36	4.13	0.13	0.28	7.22	0.28
Ash	0.50	0.005	-	-	0.01	-	-	-
Ohio buckeye	0.40	0.01	0.03	-	-	-	-	-
Hickory	0.40	-	0.14	-	0.02	0.03	-	0.03
Hackberry	0.30	-	-	-	-	-	-	-
Mulberry	0.07	-	-	-	-	-	-	-
Overcup Oak	-	0.09	-	-	0.04	-	-	-
S. oak	-	0.03	-	-	-	-	-	-
Bur oak	-	0.04	0.41	-	-	-	-	-
Sugar maple	-	-	0.23	1.01	-	-	-	-
Red oak	-	-	0.17	-	-	-	-	-
<b>TOTAL</b>	<b>14.63</b>	<b>0.59</b>	<b>1.93</b>	<b>16.07</b>	<b>0.84</b>	<b>1.18</b>	<b>41.97</b>	<b>1.18</b>