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Checklist of Major Plant Species in Ashley County, Arkansas Noted by General Land Office Surveyors

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Abstract

The original General Land Office (GLO) survey notes for the Ashley County, Arkansas, area were examined to determine the plant taxa mentioned during the 1818 to 1855 surveys. While some challenges in identifying species were encountered, at least 39 families and approximately 100 species were identified with reasonable certainty. Most references were for trees used to witness corners or lines. Prominent arboreal genera recorded in these early survey records included *Quercus, Pinus, Carya, Liquidambar, Nyssa, Ulmus, Acer, Fraxinus,* and *Taxodium.* A number of shrubs, vines, graminoids, and herbaceous species were also reported, including notable genera like *Vaccinium, Lindera, Crataegus, Myrica, Rubus, Smilax, Vitis, Arundinaria,* and *Bidens.* Even though very few GLO surveyors had formal training in plant identification, their familiarity with local and regional floras (undoubtedly supplemented by their field crew's knowledge) contributed to the relative accuracy of the effort. Taxonomic discrepancies (e.g., shifting species names, delineation of new taxa since the survey was completed, obscure common names) have obscured a number of identifications in this study. Nevertheless, the GLO records are a valuable and systematic (statewide) source of information from a period of time that predates most formal botanical investigations.

Introduction

In the developing United States, land surveying was considered a highly prestigious profession. This recognition partially arose from an appreciation of the value of surveyed lands and respect for those applying this trade in a virtually unknown wilderness. Many of America's "founding fathers" like George Washington and Thomas Jefferson spent at least some time surveying and contributed to our knowledge of early American landscapes (Spurr, 1951; Baldwin, 1958). However, the colonial metes and bounds system used by these early pioneers was considered inadequate for the rapidly expanding nation, prompting the government to initiate a rectangular approach to land surveying under the supervision of the General Land Office (GLO) (Stewart, 1935; Clement, 1958).

The Arkansas GLO survey started at the confluence of the Arkansas and Mississippi rivers in October of 1815 with the establishment of the 5th Principal Meridian (Nelson, 1997). The state's Base Line (beginning at the confluence of the St. Francis and Mississippi rivers) intersected this meridian in a remote swamp in east-central Arkansas. Subdivision of Arkansas into townships and ranges started in lands already ceded by Native Americans. Statewide, the GLO survey took over three decades of continuous effort, with initial efforts completed by 1849 and some lines resurveyed as late as 1855 (Stewart, 1935).

One of the most important contributions of this surveying system was the codification of the practice, including how to mark corners and what observations to make along a traverse (Stewart, 1935). Government surveyors recorded information in their notebooks on estimated site productivity, witness trees, general forest types, major understory attributes, and other interesting features related to vegetation patterns. Prior to original land surveys, only a handful of observers had recorded any kind of environmental information in Arkansas, and these tended to be concentrated along major transportation corridors (e.g., navigable rivers or one of the few roads available) or near areas of geological interest (e.g., hot springs, mountains, mines).

While there are some issues with how the GLO survey notes can and should be used, they represent an invaluable asset if properly interpreted (Bourdo, 1956; Noss, 1985; Whitney and DeCant, 2001). Ecological researchers have long used GLO survey notes to help determine presettlement vegetation patterns in many areas of the country (e.g., Lutz, 1930; Howell and Kucera, 1956; Jones and Patton, 1966; Delcourt, 1976; Foti and Glenn, 1991; Nelson, 1997; Black and Abrams, 2001). A recent review of the published botanical resources of Arkansas (Peck and Peck, 1988) specifically listed the GLO records as a potential source of information. The study presented here provides a species checklist of the trees, shrubs, vines, and other

notable plants of the Ashley County, Arkansas, area as interpreted from the GLO survey notes.

Materials and Methods

During the original period of surveying in Ashley County (1818 to 1855), at least 16 different GLO deputy surveyors officially traversed the region. Their transcribed notes were digitally scanned by the Arkansas Commissioner of State Lands and made publically available on compact disks in 2000. These searchable GLO notes have been separated into boundaries, interiors, and plat maps. Boundary and interior records were identified for the townships in and bordering Ashley County. From these records, relevant information was transferred onto specially designed data sheets for later analysis. This paper reports only species identification, but most witness trees also had diameter and geographic coordinate data.

How taxonomically capable were the GLO survey crews? The seasonality of the Ashley County surveys (usually from November to April) placed their efforts during the dormant season, when many species are not readily identifiable. Presumably, early surveyors and their crews were familiar with local vegetation, even during leaf-off (especially for those species of commercial, nutritional, or medicinal value). No assessment of the accuracy of their taxonomic skills is possible, but for this effort, surveyor identifications were assumed to be reasonable. Surveyor plant names were then associated with potential scientific names, which led to another challenge: though many labels have transcended the years since being applied by the GLO surveyors, a handful of species did not have any common name equivalents in contemporary taxonomic references (e.g., Smith, 1988; Moore, 1999). Local botanical experts were consulted to determine the best interpretations of these taxa. In addition, some common names were liberally applied to species, thus necessitating an inclusive classification. Pin oak, for example, is the currently accepted common name for *Quercus palustris* Muenchh., but historically "pin" referred to the long, narrow leaves found on willow oak (*Q. phellos* L.), water oak (*Q. nigra* L.), and laurel oak (*Q. laurifolia* Michx.). Nuttall oak (*Q. texana* Buckley) was also listed as a pin oak candidate because it is locally common and closely resembles *Q. palustris* (which is not native to southeastern Arkansas).

Results and Discussion

At least 39 different families and over 100 species, subspecies, and varieties were recorded by the GLO surveyors in the Ashley County area (Table 1). Surveyors were not charged with detailed botanical assessment; rather, their instructions were specifically designed to expedite settlement by using the most convenient and healthy trees available (Stewart, 1935; Clement, 1958). This almost certainly resulted in the underestimation of the taxa present in the study region. Some species may also have been missed because of vagueness in common name application, thus subsuming additional candidates under the preferred options. For example, Table 1 lists *Crataegus berberifolia* T. & G. and *Crataegus crus-galli* L. as the most likely local candidates for "red haw," but Bush (1926) listed 23 different *Crataegus* as "red haw." Even though many of these *Crataegus* are not found in southeastern Arkansas, any inadvertent lumping would reduce the number of species recognized. Tree species were most commonly noted because they were used to mark important survey locations, but some shrubs, woody vines, grasses, and other herbaceous taxa were also identified. Unfortunately, a large portion of the study area's presettlement richness is incorporated under the unclassifiable labels in Table 2.

Nevertheless, study of the GLO notes will considerably supplement the available knowledge of vegetation patterns for an area that received very little botanical exploration prior to the 20th Century. Early expeditions by trained botanists in Arkansas (e.g., Owen, 1860; Harvey, 1881; Warder, 1881; Call, 1887-9; Bush, 1897) were often limited in extent and lacked detail, making it very difficult to recognize historical patterns. Contrast this to the GLO survey effort, which traversed the entire state on at least a one mile by one mile grid. The recently improved accessibility of Arkansas GLO notes, coupled with expanding interest in restoration ecology and ecosystem science, bodes well for research into historical vegetation patterns. For instance, it should be possible to construct maps of presettlement species distributions using the GLO records in much the same way as herbarium archives are used to develop a plant distribution atlas.

Conclusions

While most understory (and some canopy tree) species were not mentioned in the GLO notes, scores of arboreal and understory species were labeled with reasonable certainty in the Ashley County area. The systematic design of the GLO resulted in a spatially thorough canvassing of the landscapes, even if the taxonomic resolution was not as precise as if conducted by a trained academic botanist. Notwithstanding the uncertainty of some identifications, the original General Land Office surveys have considerable potential for the investigation of Arkansas flora years before most other efforts.

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Table 1. Surveyors' identifications, probable modern interpretations, and stratum of the plants identified to species in the Ashley County, Arkansas, area GLO survey records.

Family Surveyor identification[a]	Probable species[b]	Strata code[c]
ACERACEAE		
box elder	*Acer negundo* L.	O
maple	*Acer rubrum* L. var. *rubrum* *Acer rubrum* L. var. *drummondii* (H. & A.) Sarg. *Acer saccharinum* L. *Acer saccharum* Marsh. var. *floridanum* (Chapm.) Small & Heller	B
sugar maple	*Acer saccharum* Marsh. var. *floridanum* (Chapm.) Small & Heller	O
sugar	*Acer saccharum* Marsh. var. *floridanum* (Chapm.) Small & Heller *Celtis laevigata* Willd. [ULMACEAE]	O
ANACARDIACEAE		
sumac (flowertop sumac)	*Rhus glabra* L. *Rhus copallina* L.	U
ANNONACEAE		
pawpaw	*Asimina triloba* (L.) Dunal	B
AQUIFOLIACEAE		
holly	*Ilex opaca* Ait. *Ilex ambigua* (Michx.) Torr. *Ilex decidua* Walt. var. *decidua* *Ilex verticillata* (L.) Gray	B
black elder	*Ilex decidua* Walt. var. *decidua*	O
ARALIACEAE		
prickle sumac	*Aralia spinosa* L. *Zanthoxylum clava-herculis* L. [RUTACEAE]	U
ASTERACEAE		
Spanish needles	*Bidens bipinnata* L. var. *bipinnata*	U
BETULACEAE		
alder (swamp alder)	*Alnus serrulata* (Ait.) Willd.	U
water birch (birch)	*Betula nigra* L.	O
water beech	*Carpinus caroliniana* Walt.	O
hazel	*Corylus americana* Walt. *Hamamelis virginiana* L. [HAMAMELIDACEAE]	U

horn beam (horn beme)	*Carpinus caroliniana* Walt. *Ostrya virginiana* (P. Mill.) K. Koch	O
ironwood	*Ostrya virginiana* (P. Mill.) K. Koch *Carpinus caroliniana* Walt.	B
BIGNONIACEAE		
catalpa	*Catalpa bignonioides* Walt. *Catalpa speciosa* Warder	O -
BROMELIACEAE		
Spanish moss	*Tillandsia usneoides* L.	U
CAPRIFOLIACEAE		
elder bushes	*Sambucus canadensis* L.	U
CORNACEAE		
dogwood	*Cornus florida* L. *Cornus foemina* P. Mill. subsp. *foemina*	B
swamp dogwood	*Cornus foemina* P. Mill. subsp. *foemina*	U
EBENACEAE		
persimmon	*Diospyros virginiana* L.	B
ERICACEAE		
huckleberry (hackelberry)	*Vaccinium arboreum* Marsh. *Vaccinium elliottii* Chapm.	U
whortleberry	*Vaccinium stamineum* L. *Vaccinium virgatum* Ait.	U
FABACEAE		
locust	*Gleditsia aquatica* Marsh. *Gleditsia triacanthos* L. *Robinia pseudoacacia* L.	O
honey locust	*Gleditsia triacanthos* L. *Gleditsia aquatica* Marsh.	O
pea vine	*Galactia mohlenbrockii* Maxwell	U
FAGACEAE		
chinkapin (multiple spellings)	*Castanea pumila* (L.) Mill. var. *pumila*	B
beech	*Fagus grandifolia* Ehrh.	O
oak (many possible species)	*Quercus* spp.	B
white oak	*Quercus alba* L.	B

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red oak	*Quercus falcata* Michx. *Quercus pagoda* Raf.	O
Spanish oak	*Quercus falcata* Michx. *Quercus pagoda* Raf.	O
overcup oak	*Quercus lyrata* Walt.	B
black jack	*Quercus marilandica* Muenchh.	B
swamp oak	*Quercus michauxii* Nutt.	O
swamp white oak	*Quercus michauxii* Nutt.	
chinkpin oak	*Quercus muehlenbergii* Engelm.	O
water oak	*Quercus nigra* L. *Quercus phellos* L. *Quercus laurifolia* Michx.	O
pin oak	*Quercus phellos* L. *Quercus nigra* L. *Quercus texana* Buckley *Quercus laurifolia* Michx.	B
willow oak	*Quercus phellos* L. *Quercus nigra* L. *Quercus laurifolia* Michx.	O
post oak	*Quercus stellata* Wang. var. *stellata* *Quercus stellata* Wang. var. *margaretta* (Ashe) Sarg. *Quercus stellata* Wang. var. *paludosa* Sarg.	B
black oak (B. oak)	*Quercus velutina* Lam. *Quercus shumardii* Buckl. *Quercus pagoda* Raf.	B
HAMAMELIDACEAE		
sweetgum	*Liquidambar styraciflua* L.	O
witch hazel (witch hackle)	*Hamamelis virginiana* L.	U
HIPPOCASTANACEAE		
buckeye	*Aesculus pavia* L.	U
JUGLANDACEAE		
hickory	*Carya aquatica* (Michx. f.) Nutt. *Carya cordiformis* (Wang.) K. Koch *Carya glabra* (Mill.) Sweet var. *glabra* *Carya ovata* (P. Mill.) K. Koch *Carya texana* Buckl. *Carya tomentosa* (Poir.) Nutt.	B

pignut hickory	*Carya cordiformis* (Wang.) K. Koch	O
pecan	*Carya illinoensis* (Wang.) K. Koch	B
scalebark hickory	*Carya ovata* (P. Mill.) K. Koch	O
shellbark hickory	*Carya laciniosa* (Michx.f.) Loud. *Carya ovata* (P. Mill.) K. Koch	O O
black hickory	*Carya texana* Buckl.	O
black walnut (walnut)	*Juglans nigra* L.	O
LAURACEAE		
spicewood (spice, spice bushes, swamp spice)	*Lindera benzoin* (L.) Blume	U
sassafras	*Sassafras albidum* (Nutt.) Nees	B
LILIACEAE		
greenbriar (sawbriar)	*Smilax* spp.	U
MAGNOLIACEAE		
sweet bay (bay, bull bay)	*Magnolia virginiana* L.	B
poplar	*Liriodendron tulipifera* L.	O
MORACEAE		
mulberry	*Morus rubra* L.	O
MYRICACEAE		
myrtle	*Myrica cerifera* L.	U
NYSSACEAE		
gum	*Nyssa sylvatica* Marsh. var. *sylvatica* *Nyssa aquatica* L. *Liquidambar styraciflua* L. [HAMAMELIDACEAE]	B
black gum	*Nyssa sylvatica* Marsh. var. *sylvatica*	B
tupelo gum (multiple spellings)	*Nyssa aquatica* L.	O
OLEACEAE		
privey (red privey, white privey)	*Forestiera acuminata* (Michx.) Poir.	B

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ash	*Fraxinus americana* L. *Fraxinus caroliniana* Mill. *Fraxinus pennsylvanica* Marsh. *Fraxinus profunda* (Bush) Bush	B
white ash	*Fraxinus americana* L.	O
PALMACEAE		
palmetto (palmeter, pametoe)	*Sabal minor* (Jacq.) Pers.	U
PINACEAE		
pine	*Pinus echinata* Mill. *Pinus taeda* L.	B
PLATANACEAE		
sycamore	*Platanus occidentalis* L.	O
POACEAE		
cane (large cane, small cane, switch cane, thin cane)	*Arundinaria gigantea* (Walt.) Muhl.	U
RHAMNACEAE		
supplejack (rattan)	*Berchemia scandens* (Hill) K. Koch	U
ROSACEAE		
red haw	*Crataegus berberifolia* T. & G. *Crataegus crus-galli* L.	B
haw	*Crataegus* spp.	B
white thorn (thorn)	*Crataegus* spp.	U
red root	*Geum canadense* Jacq.	U
wild peach	*Prunus persica* (L.) Batsch	B
black cherry	*Prunus serotina* Ehrh.	O
plum	*Prunus* spp.	U
blackberrry	*Rubus* spp.	U
RUBIACEAE		
elbow wood	*Cephalanthus occidentalis* L.	U
RUTACEAE		
prickly ash	*Zanthoxylum clava-herculis* L. *Aralia spinosa* L. [ARALIACEAE]	U

tan (tare) blanket	*Zanthoxylum clava-herculis* L. *Aralia spinosa* L. [ARALIACEAE]	U
SALICACEAE		
cottonwood	*Populus deltoides* Marsh. *Populus heterophylla* L.	O
willow	*Salix nigra* Marsh.	O
SYMPLOCACEAE		
laurel	*Symplocos tinctoria* (L.) L'Her.	B
TAXODIACEAE		
cypress (cypress knees)	*Taxodium distichum* (L.) Rich.	B
TILIACEAE		
lynn	*Tilia americana* L.	B
ULMACEAE		
hackberry	*Celtis laevigata* Willd.	B
swamp elm	*Planera aquatica* (Walt.) Gmelin	O
water elm	*Planera aquatica* (Walt.) Gmelin	O
elm	*Ulmus alata* Michx. *Ulmus americana* L. *Ulmus crassifolia* Nutt. *Ulmus rubra* Muhl.	B
sweet elm	*Ulmus americana* L.	O
red elm	*Ulmus rubra* Muhl.	O
slippery elm	*Ulmus rubra* Muhl.	O
VITACEAE		
grapevine	*Vitis* spp.	U
spice vine	*Ampelopsis arborea* (L.) Koehne	U

[a] Sometimes the surveyors used multiple spellings for the same species– these names represent the most probable intended common names.
[b] Species nomenclature and interpretations from Smith (1988) and Moore (1999).
[c] Stratum codes (reported by GLO surveyors): O = overstory only; U = understory only; B = both.

Table 2. Unknown taxa with common names too vague to identify to family as provided by the original GLO surveys of the Ashley County area.

Unknown understory taxa:

- weed	- grass	- fern
- briars	- prairie grass	- moss
- bushes	- sedge grass (sidge)	
- vines	- swamp grass	