Searching The Public Land Survey For Illinois Natural History

Jenny McBride & Marlin Bowles,
The Morton Arboretum
December 2007

Part 1: The Public Land Survey

In Their Own Words

> "Swamp about 20 or 30 chains long. It is a nasty vile place." D. A. Spaulding, 1834, Township 33 North Range 12 East section line 13-14
>
> "Left the worst of all swamps and got on dry ground." Ignatius Sprigg, Township 46 North Range 5 East section line 29-32. Section line 29-30: "Land part dry and fit for cultivation and part worse than good for nothing."
>
> "This day wet and rainy." D. A. Spaulding, July 1834
>
> "Begin to ascend handsome top of ridge." D. A. Spaulding 1834, Township 33 North Range 10 East, Indian Boundary mile 35
>
> "Land beautiful level rich prairie." Ignatius Sprigg, Oct 1837, Township 44 North Range 5 East

The surveyors working on the Public Land Survey (PLS) in northern Illinois were usually

succinct in their notes, but sometimes, as in the above examples, they added a few more words to better describe the variety of vegetation and the conditions of their work. Most of the land they traversed in the Chicago area was prairie, the majority of the remainder was timber, but the surveyors also mentioned scattering timber, barrens, swamps, marshes and thickets as they subdivided the landscape into the township system we still use today.

What was the Public Land Survey?

The purpose of the PLS was to make it easier for early European settlers in the United States to identify their land claims, as well as to advise them where to find land “fit for cultivation”. This federal project instituted a grid system made up of townships six miles long by six miles wide, resulting in 36 square-mile sections per township (figure 1). These sections are still regularly referenced in our legal property descriptions.

Figure 1. The Township Grid system. DuPage County (pictured) consists of nine complete and one partial township. The diagonal line in the southeast part of the county is one of the Indian Boundaries.

The surveyors set corner posts and marked nearby trees (bearing trees) to illustrate “you are here” at each half mile along the section lines. While they located these corners (and quarter corners, or half mile points), they also recorded much information about the

vegetation they passed through. Their notes and accompanying maps are a treasure for those of us curious about the vegetation of a relatively undisturbed northern Illinois landscape. One unfortunate shortcoming of these records is the scale imposed by the square-mile grid: since we don't have square miles of open land anymore, few of our protected areas coincide precisely with locations in the surveyors' notes. Nevertheless, there are some small scale exceptions (figure 2). As shown below, the natural savanna border at Wolf Road Prairie Nature Preserve remains intact in the position mapped by the PLS in 1821.

Figure 2. Surveyor's map of Township 39 North Range 12 East. Wolf Rd. Prairie (shown by the dashed line & "WRP") is crossed by the forest prairie border, which can be seen in the photo of Wolf Road Prairie today.

The surveyor's directions required them to designate up to four bearing trees at section corners. At quarter corners and river crossings, two bearing trees sufficed. The first tree chosen was to be the closest one in either the northwest, northeast, southwest or southeast quadrant around the corner point. The tree was "blazed" by the axeman and the survey notes recorded its species, diameter and the azimuth and distance in links from the actual corner point.

In addition to commenting on the general nature of the land, the surveyors recorded the point along each section line where the vegetation changed, perhaps from prairie to timber, or from wet prairie to marsh. They also recorded the location, species and diameter of any tree encountered growing directly on a section line (line trees). In areas with timber, they listed the tree species present along each mile, and sometimes also listed the woody undergrowth species (shrubs). Although, the undergrowth category was usually not included in the notes, we have been able to accumulate enough information

from some surveys to understand the abundance of woody undergrowth and the relative abundance of different species.

To complement the notes they took, surveyors sketched a township map showing the watercourses, timber boundaries, and settlement features described in their survey (figure 3). In the course of reviewing the notes for several counties, we have seen many discrepancies between the notes and maps. Our project has relied on the information from the notes supplemented by information from the maps to complete section interior features.

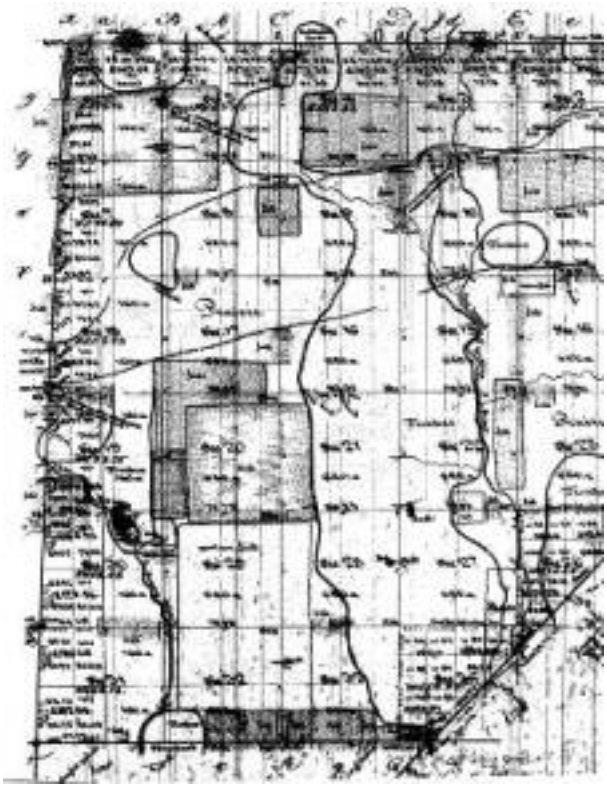

Figure 3. Surveyor's map of Township 38 North Range 10 East showing timber, prairie, roads, and agricultural fields as recorded in 1837. Diagonal line at lower right is part of the northern Indian Boundary.

How we have used these notes

Management and restoration of pre-European settlement vegetation has become a challenging priority as our largely urban society tries to evaluate the surviving fragments of natural landscape. Although the PLS notes don't include details about the ground layer species, they offer much information for land managers. Being that the landscape has

changed so much through fire suppression, agriculture, fragmentation by roads and development, logging, draining of wetlands, invasion of exotic plants and the effects of livestock, land managers are in need of references for restoration and conservation sites. We have used the PLS notes and maps to analyze the landscape pattern and timber composition of vegetation described in Cook, Dupage, Kane, Kendall, Lake, McHenry and Will counties. We hope to provide useful information for land managers by interpreting these historic descriptions.

This particular report was prepared for a general audience. We take this opportunity to include more direct quotes from the surveyors in order to highlight some of the landscape descriptions that fell through the cracks in the more formal, quantitative reports. Readers looking for a more scientific summary of our project should consult the reports prepared for each county.

The PLS in Illinois

The PLS arrived in Illinois in 1802, beginning at the southern end of the state where commerce and settlement were concentrated at that time. In 1821 the PLS reached the Chicago area. The Indian Boundaries and the strip of land between them was surveyed in 1821 and 1822 “for canal purposes”. The availability of this strip of land was the result of an 1816 treaty between the US government and the united tribes of Ottawa, Chippewa and Potawatomi which granted a 20-mile wide tract for white traders to travel between Chicago and the Illinois River. The area beyond the Indian Boundaries was surveyed in the 1830’s and 1840’s after the Blackhawk War forced the remaining native inhabitants further west.

The Survey Crew

A survey crew was required for the job. An axeman blazed (marked) the bearing trees and a flagman ventured on ahead with the survey flag. As they used chains (yes, metal chains) to measure the miles (100 links to a chain, 80 chains to a mile), a crew needed both a fore chain-man and hind chain-man to guide the heavy, clanking serpent through the obstacle course that was wild Illinois. (The notes for Township 34 North Range 13 East state that the chain carrier was to be paid five dollars per month.)

Many of the notes we looked at were from the middle of summer on the prairie – day in and day out. Some notes were from early December. It was a tough job, but these men really got to know the land. Here are some of their comments on the conditions of their work.

> "Mosquitoes plenty." John Walls, July 1821, Township 40 North Range 13 East
>
> "Land all marsh water in places 3.5 feet deep and mud. Oh horrible." John Clark 1834, meanders of Little Kalamick River
>
> D. A. Spaulding: "L. E. Waller's feet have got very sore. He therefore drives the horses and John English carries the hind end of the chain." Township 34 North Range 13 East. Then a few pages later, "Swear L. E. Waller for flagman because his feet have got sore by being wet."
>
> "Stopped work on account of rain." 1837 Indian Boundary resurvey mile 7

And the surveyors had other lives, too. See http://www.thelincolnlog.org/view/1830/8/2 for information about W.L.D. Ewing, and http://www.profsurv.com/archive.php?issue=105&article=1485 for more about D. A. Spaulding.

Part 2: Before the European Settlers

Earlier settlers

Of course there were already people living in the Chicago area long before the PLS arrived. By then the Native Americans' homelands had been drastically rearranged by the arrival of Europeans in North America. The Potawatomi were living in northern Illinois in the early 19th century, having moved down from Wisconsin.

Notes on Indians

The surveyor's notes included many references to individuals and Indian settlements, as well as surveys of short-lived reservations.

"Senajawinis wigwams in edge of prairie." D. A. Spaulding, 1834, Township 33 North Range 11 East, section line 3-10.
"Northeast of corner about 5 chains the lake bends east and in the bend of the lake a few acres of land has been cultivated by Indians." Township 46 North Range 9 East section 13. Section 3-10, "Northwest 10 chains from where line enters timber two or three acres of Indian cultivation."

"Indian campfire" along Little Kalamick meander at what is now 59th street in South Holland

"Land rolling, soil good & fit for cultivation except the bottom which is subject to occasional inundations of about five feet as appears by the water mark on the trees and as I am informed by Low-en-tip (Yellow Head) who lives in the vicinity." D.W. Beckwith 1833, Township 32 North Range 10 East section line 14-15. (For information about Chief Yellow Head see http://www.lowellpl.lib.in.us/s1993apr.htm.)

"Indian trail" Township 34 North Range 15 East section 6

"Old Sac Indian Train from Rock Island to Detroit." Township 35 North Range12 East section line 25-26, also Townships 35 North Range 13 East and 35 North Range 14 East

"Indian trace" Wisconsin state line

Reservations

The irregular lines from these reservation surveys still haunt our USGS quad maps.

Reservation "for Joseph Laughton, son of Wais-ke-shaw...This reservation is a very valuable tract...about _ well-timbered." D. A. Spaulding, 1834, Township 33 North Range 11 East.

"Reservation at Raccoon Grove" in Township 34 North Range 13 East and "land reserved for the five daughters of Monee by her husband Joseph

Bailey" (For information about these individuals See http://en.wikipedia.org/wiki/Joseph_Bailly.)

"Surveyed a half section equal to 320 acres for the son of Man-i-to-qua." Township 35 North Range 12 East

"Reservation for children of Joseph Laframboise." Township 35 North Range 12 East. Also one for the wife of Joseph Laframboise, and another for Archange Pettier.

"Reservation for Claude LaFramboise." Township 36 North Range 14 East. (For more information about Laframboise see http://www.franklinparklibrary.org/localhistory/fpnative.htm, http://www.fpdcc.com/downloads/indian_boundary.pdf, http://www.encyclopedia.chicagohistory.org/browse/bioL.html, http://homepages.rootsweb.com/~gentner/indi/329.html)

"Took no bearing trees as I thought it best to establish no line permanently within the reservation," Eli Prescott, Feb. 1839, Township 36 and 37 North Range 8 East, reservation for "Wash-kee-shaw, wife of David Laughton." This reservation had "timber splendid growth." (For more information about Wash-kee-shaw see http://www.rootsweb.com/~ilkendal/PlaceNames/KCPlaceNames.htm.)

"Reservation for Mo-ah-way." Township 37 North Range 8 East. (For more information about Mo-ah-way see http://www.ledgersentinel.com/article.asp?a=2369.)

Billy Caldwell's reservation Township 40 North Range 13 East. (For information about Billy Caldwell see http://en.wikipedia.org/wiki/Sauganash.)

Vegetation long before the PLS arrived

In order to better understand the vegetation the PLS described, we need to back up and

look at even earlier vegetation known from this area. Thousands of years ago, the northeastern Illinois landscape was covered with mixed oak and pine forests that had colonized the region following the receeding glaciers and gradual warming of the climate. This began to change more rapidly during a warming and drying trend known as the Hypsithermal Interval, which took place between 6000 and 8000 years before present. During that climatic change, fires became frequent and intense, resulting in the gradual deterioration of much of the forests. Surviving timber was most likely to be located on the east side of rivers and other firebreaks, such as topography, where it was protected from the prairie fires that moved, with the wind, from west to east. These fires that led to the forest being replaced by fire-adapted grassland were probably started by indigenous people as well as by lightning. When European settlers arrived, they constructed firebreaks and otherwise did their best to stop the wildfires. The surveyors did mention evidence of fire though:

Figure 4. Prescribed burn at a prairie restoration in DuPage County.

> “Prairie is clean and smooth and grass burned off.” D. A. Spaulding, 1834 Township 33 North Range 10 East Indian Boundary mile 40, and mile 36, “Stake nearly burned up,” mile 35, “Top of post burned off.”
>
> “Old bearing tree prostrate and nearly burned up.” 1837 Indian Boundary resurvey, mile 2
>
> “Original bearing tree supposed to have been marked. Tree is burned at the bottom where it was probably marked.” D. A. Spaulding 1834, Indian

Boundary mile 7

"The timber is nearly all white oak and that has been injured by the fire, very little good rail timber." D. A. Spaulding, May 1834, Township 34 North Range 13 East section line 12-13

Part 3: The results of our project

The Vegetation of the Seven Chicago Area Counties as the surveyors described it

Prairie

At the time of the PLS most of the vegetation in the Chicago region was prairie (table 1). Our vegetation map indicates a trend towards greater proportion of timber in the northern part of the Chicago region. This trend towards more prairie in the south corresponds to the northern boundary of the Prairie Peninsula, a wedge of prairie that extends from Iowa to Indiana (figure 5). Several townships in Will County didn't have a single tree recorded by the PLS!

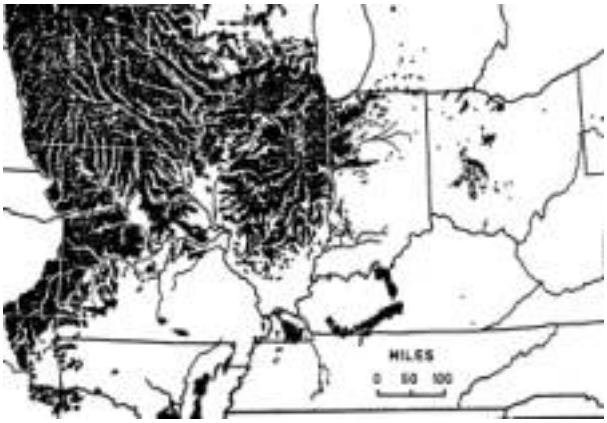

Figure 5. Distribution of prairie (shown in black) in the Prairie Peninsula (Transeau, E.N. 1935. The prairie peninsula. Ecology 16:423-437). Reproduced with permission of the Ecological Society of America.

Vegetation Type	Percent of landscape
Prairie	60.65%

Wet prairie	5.07
Brushy prairie	0.02
Prairie	**65.74%**
Timber	27.00
Scattering timber	3.10
Barrens	0.16
Brush/thicket	0.08
Woody	**30.34**
Swamp	1.43
Marsh	1.02
Lake/pond	0.82
River/creek	0.51
Slough	0.10
Grass swamp/prairie slew	0.03
Sand banks	0.02
Aquatic	**2.81***

Table 1. Percent of our study area covered by the different vegetation types recognized by the PLS. *This total is an underestimate due to the fact that our GIS software doesn't calculate area for lines, and many rivers/creeks were entered as lines rather than polygons.

Yet even areas mapped and described as prairie contained much variation, and sometimes trees. The following quotes provide a glimpse of what some of the grasslands looked like.

> "Land rolling prairie with some scattering timber." Township 37 North Range 12 East
>
> "River bottom prairie" Township 37 North Range 10 East section 25
>
> "glades of prairie" including some "plashy" glades, Wisconsin state line

> "The prairie north of creek and east of line for about 20 chains broken and covered with bushes of various sorts." D. A. Spaulding, Township 33 North Range 11 East, reservation survey

> "Prairie is partly covered with bushes." D. A. Spaulding 1834, Township 34 North Range 14 East section line 33-34

> "Bearing trees stand among a few scattering trees." D. A. Spaulding 1834, Township 34 North Range 14 East section line 7-8

> "Ridge or elevation from flat wet prairie to that somewhat high & rolling. Ridge skirted with sparse red oaks." 1837 Indian Boundary resurvey, mile 8

> "Prairie interspersed with ridges of oak land. Land and veins or streaks of wet prairie." M. T. Williams 1834, Wisconsin state line 152nd mile

> "Black oak bush in the prairie 5 inches in diameter." Township 44 North Range 4 East section 25

Brush/thicket

This vegetation type accounted for only part of one percent, but included some interesting descriptions.

> "The land is poor and covered with a thick undergrowth of oak and hickory." D. A. Spaulding 1834, Township 34 North Range 14 East section line 8-9, and section line 34-35, "Corner is in southeast edge of scattering undergrowth."

> "East of the line the land is rolling and a great part of the soil thin and covered with undergrowth." Township 34 North Range 13 East, reservation survey

> "North half of this mile a perfect timbered thicket." J. Walls, June 1821, Township 35 North Range 12 East section line 19-20

> "First part of this mile a swampy timber thicket." J. Walls 1821, Township 39 North Range 14 East section line 4-5

> "Land rich this mile, east end a thorn thicket." Township 39 North Range 12 East section line 23-26

> "Offset 50 links to avoid a very bad thicket." 1834 Indian Boundary resurvey mile 7

> "Inexcessable thicket" used many times by J. Walls in Township 37 North Range 11 East

> "Leave prairie and enter hazel bushes." Township 34 North Range 13 East section line 11-14E, also Township 35 North Range 14 East

Barrens

Barrens made up a tiny but intriguing portion of the landscape. There is still much debate about the character and origin of this vegetation type, but we interpret it as fire-affected vegetation where brush, such as American hazelnut, and the resilient black and bur oak re-sprouted after being burned off. The notes we studied suggest that barrens were usually brushy and the trees were small. Bearing trees in this vegetation were almost all oaks. Sometimes "barrens" or "bur oak barrens" were listed as undergrowth or tree species. The surveyor instructions included noting of barrens. For more details on barrens, see this link http://www.epa.gov/ecopage/upland/oak/oak94/Proceedings/BowlesPre.html

Here is how one surveyor defined barrens:

> "Entered hazel and red oak brush and scattering timber. This land is called barrens." W. L. D. Ewing May 1840, Township 38 North Range 10 East section line 33-34

Scattering timber

Surveyors used the term “scattering timber” in areas where there were large gaps between groups of trees as if the timber had become fragmented into smaller patches interspersed within prairie. Often their maps show an incomplete line for the boundary between scattering timber and prairie, as though they weren’t sure where one left off and the other began. This type of timber was probably an intermediate phase between timber and prairie, where fire was in the process of converting the area to grassland. The bearing and line trees were almost always white, black, and bur oak.

Lake County had more timber than prairie at the time of the PLS, but much of that timber was of the scattering variety.

Some descriptive examples from the notes:

> “Scrubby scattering bur oak timber.” Township 44 North Range 5 East
>
> “Timber very scattering none of it good.” D. A. Spaulding 1834, Township 34 North Range 14 East section line 21-22
>
> “This half mile can be said to be either prairie or woodland there being some scattering trees on the whole line.” Township 43 North Range 10 East section line 5-6
>
> “Uncultivated field covered with hazel brush and scattering timber.” W. L. D. Ewing May 1840, Township 38 North Range 10 East

Timber

By overlaying soils maps on our vegetation map, we were able to evaluate how well areas of alfisols (forest soils) lined up with areas surveyors described as wooded. The results showed general but not complete agreement. Soils overlays suggest that the loss of woody vegetation was happening at a slightly faster pace than the conversion of forest to prairie soils.

As may be expected, the timber category also had some notable particulars:

> “Small circular grove of young timber.” Township 40 North Range 13 East

section line 19-20

"oak openings" Township 43 North Range 9 East

"Timber a first rate growth." D. A. Spaulding 1834, Township 34 North Range 14 East section 13

"Timber a very handsome growth." D. A. Spaulding 1834, Township 34 North Range 14 East section 24, and section line 13-14, "Entered tolerable good timber."

"This corner about four chains northwest of small grove of bushes and some small timber." D. A. Spaulding May 1834, Township 34 North Range 13 East section line 14-15.

Some places in the northern part of our study area were mapped as timber, but at the corners the surveyor wrote that there were no trees near. The following examples are from McHenry county, which was over 40% timber.

"Timber very scarce, a few bur and black oaks," Township 43 North Range 7 East

"Timbered part has a few bur and black oaks," Township 45 North Range 7 East.

"Timber a few bur oaks," recorded in several places by James Thompson and the description of several miles in Township 44 North Range 7 East

Water

The surveyors used a variety of terms to describe the different wetland types they slogged through: slough, swamp, marsh, prairie slew, grass swamp, etc. Sometimes the same surveyor used different terms for the same wetland, depending on which side he approached from. While ecologists would use precise wetland terms to refer to distinctly different vegetation, we can't apply the surveyors' terms as decisively.

The next two quotes provide D. A. Spaulding's definition of "swamp."

> "The water in these two swamps is about 20 inches deep and like all other places called swamps is full of rushes, flags and water grass." 1834, Township 33 North Range 12 East section line 1-2N

> "These places designated swamp are basins or flat places from four to six feet deep full of water in spring but generally dry in fall. They grow full of high coarse grass, flags and bulrushes from four to ten or 15 feet high." 1834, Township 34 North Range 14 East

There were also many "fine" springs noted. Have a look at some other wetland descriptions.

> "There are small ponds scattered all over the driest parts of the prairie." D. A. Spaulding 1834, Township 33 North Range 12 East section 24

> "Cane swamp" James Galloway, July 1837, Township 46 North Range 8 East section line 14-23

> "Land low and washed with slews." Daniel Miller, 1821, Township 33 North Range 9 East section line 25-26

> "Swamp tremendous." J. Walls, 1821, Township 39 North Range 13 East section 33

> "Land the worst kind of a swamp, good for nothing." Ignatius Sprigg, Township 45 North Range 5 East

> "Enter swamp (cattail)." Township 44 North Range 8 East

> "A very bad swamp full of willow and other swamp bushes and undergrowth, cannot go through." D. A. Spaulding, August 1834, Township 34 North Range 15 East section line 7-18

> "This marsh grown up with bulrushes and bastard cane so high that is impossible to see the flag more than 1.5 chains." John Clark, 1834, Township 35 North Range 13 East section line 20-21

George Harrison described a slough within a marsh ("Entered marsh. Entered slough. Left slough. Left marsh") Township 42 North Range 12 East

The trees

The surveyors identified about 50 different trees by common name. We assume that most of these trees were correctly identified, though post oak and other out-of-range species did sneak onto the list. Common names are always prone to mishap.

Many researchers studying the PLS notes, both in Illinois and in other states, have discussed the possibility of "surveyor bias", i.e., did the surveyors really choose the closest trees, or did they prefer certain species or sizes for the bearing trees? They certainly wanted trees that would be around for a long time, but even if they did have a bias, they were limited by whatever selection was available near their corner point. We can look at the line trees to see if the size and type of trees encountered directly on the section lines is inexplicably different from the bearing trees chosen (table 2). Obviously, this suggests that the surveyors tended to choose bur oak more often than by chance, as white oak was more abundant along section lines.

Species	% of all bearing trees	% of all line trees
Bur oak	38.67	27.88
White oak	30.47	36.14
Black oak	11.33	13.41
"B" oak*	3.57	3.00
Hickory	3.35	4.21
Red oak	2.89	4.29
Ash	1.78	1.87
Elm	1.26	1.68

Table 2. Bearing and line trees in our study area: dominant species and percentage of total

*In the 1820's surveyors were allowed to abbreviate the tree names, so we have 344 "b" oak bearing trees from the area between the Indian Boundaries. Some of these were probably bur oaks, others black oaks.

Besides the dominants listed in Table 2, the following species were also included as bearing trees in our study area: basswood, sugar maple, pin oak, aspen, black walnut, soft maple, ironwood, pine, willow, cottonwood, black cherry, hackberry, hawthorn, birch, sycamore, Kentucky coffee tree, poplar, box elder, buckeye, cedar, tamarack (in order of decreasing frequency). The overwhelming majority of bearing trees had a diameter of 12 inches, with the maximum being 70 inches (a white oak in Will County) and the minimum two inches (also a white oak in Will County).

Although most of the vast area described as prairie by the survey didn't include trees, there were 321 corners or quarter corners in prairie that did have bearing trees. These trees were usually bur or white oaks. Bur oak, especially, with its thick, corky bark is quite fire-resistant and could have survived prairie fires.

At the other end of the fire tolerant spectrum are sugar maple ("sugartree", to the surveyors) and basswood. These species are quite vulnerable to fire. Ash and elm, usually found near watercourses, are other examples of fire-sensitive species. These types of trees were far less common than oaks in our study area. Bearing trees of these species were more likely to be found in fire-protected positions, such as the east side of watercourses.

Tree Density

Because the surveyors recorded the distance from the bearing trees to the actual corner point, we can estimate the tree density at a given corner or quarter corner. We use a technique developed by plant ecologists Grant Cottam and John Curtis called the modified point-center-quarter sampling method to calculate trees per hectare based on the distance the surveyors measured to the nearest tree in each quadrant. We established 400 trees/hectare as a maximum; higher values are possible with the point-center-quarter method, but they become nonsensical.

We began by using the usual three tree density classes: savanna (>0- 50 trees per hectare), woodland (>50-100 trees/ha) and forest (>100 trees/ha). However, we noticed that a large percentage of corners actually had densities below ten trees per hectare, so we added a fourth category: open savanna >0-10 trees/hectare (table 3).

Table 3. Tree density classes and percentage of total corners/quarter corners.

Tree Density Class	% of total
Open savanna (>0-10 trees/hectare)	39.45
Closed savanna (>10-50 trees/ha)	31.09
Woodland (>50-<100 trees/ha)	12.67
Forest (>100 trees/ha)	16.78

Density was indeed higher in areas of timber than in scattering timber (table 4). Areas of timber had a greater proportion of their corners in the woodland forest tree density categories than did scattering timber. Corners with higher density were also more likely to include fire-sensitive bearing trees. So there were fire-protected sites where the forest grew thicker, not thinned by fires, and where fire-sensitive species could persist. Though oaks were dominant in all density classes, sugar maple, ash and basswood became more abundant at higher tree densities.

Vegetation type	Open savanna	Closed savanna	Woodland	Forest
Prairie	82.43%	11.82%	3.19%	2.56%
Scattering Timber	54.30	29.46	7.96	8.28
Timber	29.96	34.45	14.93	20.66

Table 4. Percent of corners in each vegetation type according to tree density category. Some vegetation types omitted due to small sample size.

Undergrowth (also see the vegetation type “brush”)

This was mostly American hazel, or hazelnut. Oak was also commonly listed as an

undergrowth species, sometimes in the form of “oak bushes.” Willow and hickory were frequently mentioned, as were the vague “thorn” and “briers”. Other interesting undergrowth entries included “spewmake” (sumac), “barrens”, “craneberries” and whortleberries.

Other map layers

We attempted to get everything from the notes onto the map, which sometimes required simple text, or annotation. How else to handle information like “timber very thin”, “timber large”, “thickly timbered”, “timber of a dwarfish size”, “timber bur oak openings”, “timber very poor and scrubby”, “timber heavy growth,” “timber very open”, “timber first rate”, all off which offer further insight into the character of the vegetation? We did, however, opt to leave out the roads and agricultural fields mentioned in the survey; this is a vegetation map. It is important to mention, though, that there were already many cultivated fields in this area by the late 1830’s.

Points of interest

Cook County had the only willow thickets described by the PLS. There was also that spot north of what is now the Chicago loop that the survey crew described as a “swampy timber thicket.”

> La Framboise Woods near River Grove used to be a hot spot:
> “Spencer’s Tavern and quite a settlement about this point called ‘Walker’s Bridge’.” 1837, Indian Boundary resurvey mile 3

And the following structure might have affected the timber in what is now Streamwood:

> “A sawmill owned by Hill,” Township 41 North Range 9 East section 16-17.

DuPage County had a gazillion little wetlands, and those were only the ones that fell right on the section lines! It also harbored a nice example of timber on the east side of the West Branch of the DuPage River, and scattering timber on the west where the fires blazed through. That particular spot was the site of a prairie/barrens/scattering timber mix that includes what is now the West Chicago Prairie.

Kane County is home to a block of timber on the east side of the Fox River historically known as the Big Woods. A part of that grove still exists today in the Forest Preserve by the same name. Many of the bearing trees in that grove were sugar maples, and the tree density was usually in the forest category. This is a good example of the Fox River as firebreak and a protected site for fire-sensitive tree species. See this link for a description of the differences in timber east and west of watercourses. http://www.epa.gov/ecopage/upland/oak/oak94/Proceedings/Bowles.html

And then there was the following comment about staying on the survey line. Do you think he was joking?

> "Hobson's fine frame house. Passed through the passage of same," W. L. D. Ewing, May 1840, Township 38 North Range 10 East section 29-30

Kendall County had two sawmills!

> "There is a gristmill and sawmill a few chains above this point belonging to Mr. Jackson." Township 36 North Range 5 East section 25

> "Mr. Howe's sawmill about 15 chains above. Village plat of Yorkville on both sides of line and river. Village consists of six or eight buildings on south side of river." August 1838, Township 37 North Range 7 East

> And an interesting description of locally recognized brush:

> "...near north line of section two and adjoining part of the swamp is a small grove of oval shape of second rate timber filled with underbrush called brush point." Eli Prescott, August 1838, Township 37 North Range 8 East section 2-3. Also see Township 38 North Range 8 East section 35 in Kane County

Lake County, with all its scattering timber, also had a saw mill:

> "A saw and grist mill in the stream." Township 46 North Range 11 East section 32-33

Will County had a few small, isolated groves that still harbored sugar maple and other forest species. One of these places was described in a reservation survey. These small, rich groves remain impervious to our landscape models.

Will County was also the site of a mysterious mound. The following description might pertain to the Mound of Joliet.

> "A few chains west of the quarter corner is a mound of earth bearing northeast and southwest. Its length is twenty chains, breadth four chains on its surface, height 80 feet fronting the river and on the northeast 50 feet with some small timber on the northwest side," Daniel Miller, August 1821, Township 35 North Range 10 East section 19-20

In Summary

The results of our PLS study have generally confirmed what we already knew about how fire and topography determined the distribution of prairie and timber in the Chicago area. There was greater landscape cover of prairie and scattering timber in areas with little landscape fire protection, and greater tree densities as well as abundance of fire-intolerant trees (sugar maple, ash and basswood) in more fire-protected landscape positions on the eastern sides of watercourses. But there were a couple surprises (we learned things). The first one was the abundance of American hazelnut in the shrub layer. Although uncommon now, this species was the most common shrub layer plant in our woodlands at the time of the survey. The other big surprise was the very low tree density in most locations, even those areas described as timber. Canopy conditions at the time of the survey were apparently much more open than what we are used to.

Changing canopy conditions effect changes in sugar maple distribution. Compared to these historic descriptions, today we see increases in sugar maple and a decrease in oaks. This tree species shift and the increased shade in turn affects the herb layer, and even wildlife that may be dependent on oaks for food.

Now that only one-tenth of one percent of Illinois' original tallgrass prairie remains, we are beginning to grasp the enormous loss of species that went with it. Following European settlement most of the prairie quickly grew up into woodland or fell victim to

the steel plough. Prairie plants quickly die out under the shade of trees, and so do the insects that evolved to live their lives specifically on prairie plants. Grassland birds are also in alarming decline today.

Of the multitudes of wetlands the surveyors waded, only a handful remain. Drainage tiles, so beneficial for agriculture, wiped them out. It is the extent of all these changes that led to a thorough study of the PLS notes for a better understanding of what ecological restoration means in the Chicago area.

In Conclusion

This has been a delightful project to work on, not only due to the land management information we can glean from it, but also because it's so interesting to read notes written in old script, a real brush with the past (figure 6). And now that we have GIS (Geographic Information Systems) technology, we can bring these historic maps into the digital age and overlay modern maps, aerial photos, soils descriptions, etc. on them.

Figure 6. Microfilm copy of survey notes

As extensive as this project is, it still represents only a single point in the history of an ever-changing vegetation. Thousands of years ago the vegetation was quite different from what the surveyors described, and had it been left unmolested, no doubt would have continued to change in more gradual ways than those forced upon it. Still we can use this snapshot from the early nineteenth century as a reference when we dig into restoration

work or puzzle over land management practices to preserve the diverse character of our vegetation.

What happened to the section lines?

Gaze at a local road map and gradually the square-mile pattern begins to emerge. Did you travel along a section line today?

What happened to the bearing trees?

People are always eager to find any bearing trees are still standing. There probably are a few, but many of them were wiped out not too long after the survey, as the following notes attest. Also, being that many section lines became roads, bearing trees often found themselves in the way of automobiles.

Figure 7. This large bur oak in McHenry County may be an original bearing tree, as it is located at the correct distance and angle from the section corner (marked by a fence post near the tree)

> “Old witness trees are prostrate and nearly decayed.” 1837, Indian Boundary resurvey mile 5

> “Old blaze mostly overgrown and encased but when chopped out it proved quite plain.” Indian Boundary resurvey Mile 2

> “Other tree is fell down and gone.” D. A. Spaulding 1834, Indian Boundary
>
> “Other old bearing tree destroyed.” Township 35 North Range 6 East Indian Boundary mile 13
>
> “One old witness tree down and partly decayed.” September 1837, Township 39 North Range 11 East
>
> “Set 19 mile post by stump of the old witness trees. Both down and half burned up.” W. L. D. Ewing, June 1840, Township 38 North Range 10 East, Indian Boundary mile 19

The surveyors on the PLS knew they were part of a historic federal project, and probably felt twinges of immortality when looking back on their groundbreaking work. Though we still use their township system, it does not garner the fascination, the repeated readings that the more fleeting matter in their notes inspires. How could they ever have dreamed that almost 200 years later biologists and land managers would be scouring their terse notes for any tidbit of information about the now almost completely destroyed native vegetation?