

Planting 20 – Naylor Road Planting/West Heinkel Unit – Spring 1996

This agricultural ground was planted in stages for several years. First, in Fall 1995, a “waterway” was stabilized with posts and erosion fence materials and hay bales and then it was seeded to red top grass and native forbs. Then in spring 1996 a “cover crop” (red top grass?) was noted to be planted on the very driest, highest hilltop and the edges near the trees (south side of trees). Jay also in Spring of 1996 planted a rich mix of forbs and little bluestem on the hill and woods edges.

In Fall of 1997 large parts of the rest of the upper portion of the field (highly erodable hillsides and top) were planted. Some areas with diverse and higher C index forb and grass mix and other areas to redtop and common species such as little bluestem, Canada rye, *Ratibida pinnata*. Seed was added to the first hilltop that had been initially seeded in 1996.

In the Fall of 1998 more of the upper portions of the field were seeded to high quality forb mixes.

Jay notes that the diversity of plants growing now (1999) in 1998 seeded hilltop is greater than the diversity in the 1997/1996 seeded hilltop. Could this be because in 1996 that hill got little bluestem and it competes with the forbs, where as the 1998 hilltop got much less little bluestem.

In 1999 seed was added to the entire planting (overseeded) with a lot of diversity.

The water way and planting edges were mowed in summer of 1998 and 1999. In addition the front portion (south edge along Naylor Rd.) was mowed twice in summer of 1999 to reduce the seeding of wild parsnip and Queen Anne’s lace.

The area burned well in March of 1999.

Jay Stacy is the steward and adds new species frequently. He also controls many of the weeds by mowing (Canada thistle and Parsnip) and pulling or hand cutting (Queen Anne’s lace, sweet clover) or selectively herbiciding (burdock).

Restoration Plan for the Naylor Road Area
of
The Nature Conservancy's Nachusa Grasslands

Mary Vieregg
NRES 320: Restoration Ecology
Dr. Anthony Endress
May 3, 2001

The goal of this project is to continue the development of a restoration plan for the Naylor Road area of the West Heinkel Unit in The Nature Conservancy's Nachusa Grasslands Preserve located in Lee and Ogle Counties in north central Illinois. The area encompasses roughly 50 acres in northwestern Lee County previously farmed and grazed. Nature Conservancy stewardship began in earnest in 1997, and the management plan is evolving as more acreage is taken out of crop farming and the stewards gain increasing familiarity with the land. Ideally, the area will be restored to its presettlement condition in an effort to encourage and preserve biodiversity.

The site's physical characteristics:

Lee County has a temperate, humid, continental climate typical of northern Illinois. Generally, northwestern Lee County is rolling country that formed in a glacial till plain drained by the Rock River. It is included in the Rock River Hill Country Division of Illinois. Preglacially, the Rock River channel ran well east (just east of present day Rochelle) of its present location, and it joined the preglacial Mississippi River near the site of present day Princeton, IL. (figure 1). During that time, the drainage of the study area was to the east. By the time the Wisconsin glacial period ended, however, the Rock River had shifted to its present more westerly location, and the drainage of northwestern Lee County had reversed itself. One can only imagine the chaotic shifting of sands, gravels, and outwash as the landforms changed.

The specific area under study is a relatively small but diverse piece of land. Starting in the southeastern corner of the roughly rectangular parcel (figure 2), there are upland knobs that reflect the underlying Ordovician St. Peter sandstone outcrops. The land slopes down from these knobs to the west. To the north there are two wooded areas separated by an intervening lobe of grass. The western half of the parcel and the

wooded area furthest north along the eastern edge gently slope down to a creek bed draining into Franklin Creek which in turn drains into the Rock River. An additional small knoll interrupts the grade along the western edge.

As indicated by the soil map (figure 3), the soils vary with the topography. Beginning again with the southeastern corner and moving west and north, the soils transition from Martinsville silt loam through Billett fine sandy loam and back into Martinsville silt loam again before reaching the ponded Comfrey silt loam of the creek area. The small knoll interrupting this gradient is composed of a Boone variant of loamy fine sand. Moving northward from the southeastern corner, the same Boone variant loamy fine sand and Chelsea fine sand underlie the wooded areas until they transition into the Martinsville silt loam again just south of the creek bed.

Except for the Comfrey silt loam of the creek area, all of the soils are well-drained to excessively drained in character. The Boone variant loamy fine sand soil in the wooded area and the small knoll along the western edge are fairly shallow, and the sandstone bedrock can restrict root growth. It formed in sandy material weathered from the sandstone bedrock (Soil survey 102). The Chelsea soils formed from sandy glacial outwash materials reworked by the wind after the glacial meltwater receded (Soil survey 144). The poorly drained Comfrey soils formed in alluvium (Soil survey 144). The Martinsville soils formed in a thin layer of loess and in the underlying stratified, loamy sediments of the area (Soil survey 120). The Billett soils are deep, well-drained soils that formed on dunal uplands and terraces (Soil survey 120) again reflecting the shifting waters of the glacial Rock River through the area.

It is generally thought that all of these soils except the Comfrey silt loam of the creek area formed in part from the organic actions of varying degrees of tree growth following the end of the glacial period (Smith et al. 21). The Comfrey silt loam in the creek area appears to have formed as a result of wet prairie plant and tree growth

(Smith et al. 95). These suppositions are reinforced by the reports submitted to the Government Land Office by early public land surveyors and will be discussed in more detail later in this paper.

The site's historical use:

Just prior to settlement by non-native Americans, the Rock River served as the dividing line between the Winnebagoes to the west and the Pottawatomies to the east (south to the Illinois River). Members of the tribes intermingled and intermarried. They had succeeded the Illini, or Illinois Confederation of Algonquin Tribes, who had previously inhabited the area but moved out after Pontiac was murdered by a Kaskaskia tribesman in 1722. 1825 War Department estimates of Pottawatomies in Michigan, Indiana, and Illinois numbered 6500 (Stevens 2:7). Their most important village in Lee County was Shab-o-na, but most of the Potawatomes apparently lived along the Rock River in small groups of three to four families. The land was purchased from the Pottawatomies by the U.S. Government in the Treaty of Prairie du Chien in 1829. No artifacts or evidence of habitation by the Pottawatomies or others have been found at Nachusa Grasslands. It seems likely that they chose instead to live further south along Franklin Creek or west along the Rock River.

The land was surveyed for the United States General Land Office during the spring of 1840 by W.S. Hamilton. His field notes indicate that the study area was "timber" (GLO field notes, vol.486), and he identifies two hickories as the witness trees for the southwest corner of the study area. One of the hickories was 3" in diameter and the other was 6" in diameter (figure 4). The witness trees for the corner of the interior quarter section were two black oaks each about 10 inches in diameter. This point falls about ½ mile south of the study area. Two large hickories (12" in diameter and 10" in diameter) marked the section line about ½ mile east of the study area. North of the

creek at the northern end of the study area, the plat map indicates a change to prairie (figure 5) (GLO plat book). The use of a stone to serve as the witness mark underscores the map's representation. In summary, the survey notes and plat map seem to indicate that much of the study area was a black oak/hickory savanna, and that the "timber" extended north of the small creek. This meshes with the soil interpretation except for the creek area which the soils seem to indicate was a mix of wet prairie and trees.

From the U.S. government, much of the land in the study area was granted to Thomas R. Greene in a land warrant (#4097) probably for military duty perhaps in the Black Hawk War. He lived in Chicago and in May of 1850 sold the land to Robert and Eleanor Spraul (or Spraul, or Sproul, or Sprawl depending on which record you look at) (Deed W293). The New Combination Atlas of Lee County, IL 1872 indicates that during the intervening 22 years, the Sprauls cleared the western portion of the property of trees but kept the southeastern corner in "timber" (Everts et al.). This probably began a land use pattern of row cropping the Martinsville and Billett soil areas while keeping the Boone variant and Chelsea areas for grazing. (Mr. Spraul was also elected Justice of the Peace in the 1850 election, and they sold a corner of their property in 1851 to the local school district for \$1.00 to use for a school site (Deed H197).) In October of 1885, the Sprouls sold the land to James Feldkirchner (Deed 54-147) who in turn sold it to Joseph Feldkirchner the same month (Deed 51-123). The Standard Atlas of Lee County, IL 1900 (figure 6) indicates that the Feldkirchners were respected farmers and stockman suggesting that the land continued to be used for both purposes (Ogle et al). Because the soils drain so well, no drainage tiles were laid in the site. When the land was purchased by the Nature Conservancy in 1991, the Martinsville and Billett soil areas had been planted in corn. The Boone variant and Chelsea soil areas had recently been grazed and there were tree communities (albeit not black oak/hickory savanna communities) still present on them. It is likely that much of the hardwood present at time

of settlement was cut for lumber and shingles by J.H. Abbot who lived on the land just northeast of the Sprouls and built a lumber mill nearby (Stevens 1: 423).

The creek area with the ponded Comfrey soils remains a bit of a mystery. The soils seem to suggest the longstanding presence of a wet prairie community. The public land survey suggests the presence of “timber” in 1840. The 1872 Lee County atlas suggests that the area was open at that time. The 1939 aerial photo shows the area open. The 1980 wetlands inventory aerial photo (figure 7) shows the area full of trees as does the 1988 USGS aerial photo (figure 8). In the winter of 1999, the decision was made to cut and drag out the nearly 1500 box elder trees in the creek area leaving behind the beginnings of a shrub and wet prairie community including hazelnut (*Corylus americana*), wild plum (*Prunus spp.*), and a huge, old cottonwood (*Populus deltoides*) which just recently blew down in an early spring storm.

The restoration management plan:

When the property was purchased in 1991 (figure 9), active management was put on hold because of other preserve priorities. A detailed management plan was developed in 1995 that had nine unit-wide objectives (Kleiman 1):

1. Enhance diversity of woodland and areas that may have been tall grass savanna through seeding after burns and removing invasive weeds (multiflora rose, cherry, some hackberry, buckthorn, European honeysuckle).
2. Blend edges of woodland/savanna with planting to the north and east and eventually with old fields to be replanted to the west and south. Add appropriate seed into edges after burns.
3. Plant old fields back to prairie and current agricultural field back to prairie.
4. Restore diversity to riparian corridor.
5. Keep a stewardship journal to track progress, changes, tasks accomplished, and to allow for finesse in the restoration process.
6. Keep lists of all native plant species. Generate list of seed species needed for diversity.
7. Map locations of any threatened and endangered plant species. Survey for rare animal species. Generate photocopy-ready maps for each.
8. Track each problem weed (multiflora rose, Canada thistle, parsnip, sweet clover, reed canary grass, etc.) and generate a simple location map.
9. Follow burn regime and track effects of burns.

Stewardship began in earnest, however, in 1996, when volunteer steward Jay Stacy adopted the unit. His observations of the remaining plant communities in the woods and along the riparian corridor and a floristic quality study by Dr. Gerould Wilhelm of the Conservation Research Institute suggested to him the following:

1. The areas that are now woods with black oak, an occasional hickory and lots of cherry and buckthorn should be restored to a black oak/hickory savanna community.
2. The riparian community full of box elder trees but also containing a remnant native shrub community should be restored to a wet prairie/shrub community.
3. The corn fields should be restored to a dry to mesic prairie community.
4. The transitions between the communities should be encouraged to develop naturally through the reinstatement of the natural process of fire and through the removal of non-native and encroaching species.

The research for this paper suggests that all of these goals are solidly supported by the evidence available regarding the nature of the presettlement landscape except one. Both the soil types and the public land surveys indicate that the cornfield areas were woodland of undetermined density. Because the area witness trees were black oak and hickory, perhaps black oak savanna is the correct assumption. In any case, it seems likely that the cornfields were not open prairie.

The presettlement riparian corridor community may have been transitional between the timber to the south and the prairie to the north. The goal of establishing a wet prairie/shrub community seems like a reasonable choice given the uncertainty associated with its original identity.

The plan's implementation:

In 1996, the southern cornfields where the highest knobs are located were converted to red top grass (*Panicum rigidulum*) by the preserve manager. In the fall of 1997, Mr. Stacy began an aggressive seeding strategy on the two highest knobs. He planted seedlings of prairie dropseed (*Sporobolus heterolepsis*), spiderwort

(*Tradescantia ohiensis*), and prickly-pear (*Opuntia humifusa*) and a seed mix of 68 prairie grasses, sedges, and forbs (figure 10) believed to be native to the sandy, gravelly, well-drained soils in the area. During the following four years, the area has been selectively weeded, monitored, overseeded, and burned. Of the 68 species planted in 1997, 53 have been identified as presently growing. Aggressive effort is being undertaken to eliminate wild parsnip (*Pastinaca sataiva*), yellow sweet clover (*Melilotus officinalis*), and Queen Anne's lace (*Daucus carota*) from the planting.

The next area of red-topped cornfield just west of the first one was planted with a prairie mix in 1998. In 1999, a third portion of cornfield down slope was converted using a slightly different seed mix based on soil type and hydrology, and the grassy neck between the two wooded areas on the east side was plowed and planted with native seed including Canada rye (*Elymus canadensis*) as a cover crop. In the fall of 2000, a fourth area of cornfield was harvested and the stalks were burned instead of plowed under before fall planting. Volunteers hand seeded the field with an appropriate native prairie seed mix of about 85 species. In April, 2001, compass plant (*Silphium laciniatum*), *Liatris spp.*, western sunflower (*Helianthus occidentalis*), and pale purple coneflower (*Echinacea pallida*) were already making an early appearance. All of the seed used on the preserve must be harvested within a 50 mile radius, and much of it is collected by volunteers on the preserve.

The final cultivated field section will be planted in crops for the 2001 growing season and will be converted to native vegetation in the fall. This final piece of cropland is the most evident transition area between the upland and the riparian topography. Consequently, stewards are in the process of planning seed collection for three different seed mixes that will reflect that transition in their composition and relative abundances of selected species. One seed mix will be upland in nature, one will be mesic to facultative obligate for the area leading right up to the creek, and one will be a sandy savanna mix

for the remaining very sandy knob with a black oak signature on the western side of the field.

Work in the wooded areas has focused on removing non-native species, encroaching native species such as cherry (*Prunus sp.*), and domestic apple (*Malus s.p.*) while retaining the oaks (*Quercus sp.*), hickories (*Carya sp.*), walnuts (*Juglans sp.*), and some hackberry (*Celtis occidentalis*). Seeding of black oak savanna grass and forb species has also been done using a species list developed for the silt loam savannas of Nachusa Grasslands by Todd Bittner in 1995 (appendix 1). This list differs slightly from that developed by Steve Packard for bur oak savannas (Packard 166-67) and recognizes the slightly different plant associations found in the two savanna types.

Following the removal of the majority of the box elders during the winter of 1999, the focus in the riparian area has been on controlling box elder resprouts and weeds like canary grass (*Phalaris arundinacea*), wild parsnip (*Pastinaca sativa*), and Dame's rocket (*Hesperis matronalis*) while at the same time monitoring seed bank regeneration. Sedges and blue flag iris (*Iris versicolor*) that lay dormant in the heavily shaded soil for years are already starting to make their appearance. Seeding of native associates has also begun and will continue as the community identifies itself over time.

The creek itself has fairly high sinuosity and stable banks except in a small middle reach where there has been some bank collapse and gulying. While still under discussion among the stewards, it seems likely that no major artificial structures will be installed in this area to control further erosion. The consensus seems to be developing that we should try fairly passive current diversion and habitat creation techniques involving boulders and logs first and let the land alongside the stream heal itself further before taking a more active approach should it be necessary at a later date.

Summary

The Naylor Road area of the West Heinkel Unit of Nachusa Grasslands is a wonderful opportunity to restore and recreate a mosaic of interrelated presettlement Illinois landscapes --- black oak/hickory savanna habitat, wet prairie/shrub and riparian habitat, and dry to mesic prairie habitat. As the natural processes are reinstated and the gene pool is replenished, the area should provide refuge for beleaguered native species which will sort themselves out and assume their appropriate relationships on the site. It will also provide refuge for humans who crave the beauty, silence, and awesome complexity of the all too rare Illinois of old.

Works cited

- Deeds on file in the County Clerk's Office, Lee County Courthouse, Dixon, IL
- Everts, et al. New Combination Atlas Map of Lee County, IL. Chicago: Geo. A. Ogle & Co. Publishers and Engravers, 1872.
- Kleiman, William. "Management Plan for West Heinkel Unit". Nachusa Grasslands, The Nature Conservancy, 1995.
- Ogle, George A., et al. Standard Atlas of Lee County, Illinois. Chicago: Geo. A. Ogle & Co. Publishers and Engravers, 1900
- Packard, Stephen, and Cornelia F. Mutel, ed. The Tallgrass Restoration Handbook for Prairies, Savannas, and Woodlands. Washington, D.C.: Island Press, 1997.
- Smith, R.S., et al. University of Illinois Agricultural Experiment Station Soil Report No. 37. Lee County Soils. Urbana, IL. June 1927.
- Stevens, S. J.. History of Lee County, Vol. 1. Chicago: S. J. Clarke Publishing Co., 1914.
- Stevens, S. J.. History of Lee County, Vol. 2. Chicago: S. J. Clarke Publishing Co., 1914.
- U.S. Department of Agriculture, Soil Conservation Service. Soil Survey of Lee County Illinois. 1985.
- U.S. General Land Office. Public Land Survey Field Notes. 1840.
- U.S. General Land Office. Public Land Survey Plat Book for Lee County Illinois. 1870.