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Symphony in the Flint Hills Field Journal

2014 – Flint Hills Land, Sky, and People (Cathy Hoy, Jim Hoy, Marty White, Editors)

Sustainable Prairie

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Recommended Citation

Obermeyer, Brian (2014). "Sustainable Prairie," *Symphony in the Flint Hills Field Journal*.
<https://newprairiepress.org/sfh/2014/flinthills/3>

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The Field Journals are made possible in part with funding from the Fred C. and Mary R. Koch Foundation.

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Sustainable Prairie

Tallgrass prairie once blanketed approximately 170 million acres of North America, from Texas up into Canada and from Kentucky west into Kansas. Only about 4 percent of this once vast sea of grass remains, making tallgrass prairie the most altered ecosystem on the continent in terms of acres lost.

Roughly two-thirds of what's left is found in an approximate fifty-mile band of native rangeland that runs north to south across east-central Kansas and down into Oklahoma. This expanse of prairie is called the Flint Hills in Kansas and the Osage Hills in Oklahoma; collectively, the area is sometimes referred to as the Greater Flint Hills. Explorer Zebulon Pike first coined the name for this area in 1806 when he recorded in his journal while crossing what is now Chase County, "Passed very ruff [sic] flint hills. My feet blistered and very sore."

What really sets the Greater Flint Hills apart from other tallgrass remnants is the scale and intactness of the landscape. To drive this point home, I like to recount a story from a professor who told me once how he, when leading botany field trips to a small prairie remnant in Iowa, would ask students to hunker low to the ground with hands cupped to their faces to serve as blinders. At first the students were perplexed by his instructions, but they soon realized the object of the exercise: to gain an appreciation of the prairie's true essence: open space.



SQUARE DANCE II, IV, V, VII
Julie Wagner



JUNE WIND
John D. Morrison

Afterwards, he would encourage his students to visit the Flint Hills, where in many places one can stand tippy-toe on the highest ridge around without the need for blinders!

Deep-rooted prairie plants created some of the most fertile soils in the world, making the region ideal for agriculture. Much of the tallgrass prairie was plowed in just a few decades during the later 1800s. But the prairie persisted here because shallow soils and limestone outcrops discouraged the sod from being turned wrong-side-up. An elder Osage man reportedly told a homesteader passing through the Flint

Hills with a plow strapped to his wagon, “You won’t put that iron thing in the ground here.” We’ll never know if his prophetic advice was heeded. While farming may not have been suitable here, except along stream courses, ranching was. In fact, the Flint Hills uplands are one of the most productive native grasslands in the world.

The predominant ranching practice in the Flint Hills has long been to fatten cattle shipped in for the summer grazing season. Until about the mid-1950s, transient cattle, mostly from Texas, were brought here to feed on the rich tall grasses for grass fattening. After gaining

as much as four pounds per day, cattle were rounded up and shipped by rail to the large packing houses of Kansas City, Omaha, and Chicago. The Flint Hills uplands were perhaps the most important grass-fattening area in the nation, but the practice eventually fell out of favor, as consumers failed to appreciate sustainable, grass-fed beef. Today, most cattle are sent west following the summer grazing season for final finishing in feedlots.

Another ranching practice used in the Flint Hills is the extensive use of fire each spring prior to the arrival of cattle. The tradition was passed down from Native Americans who lit the prairie to lure game. Not everyone here thought pasture burning was a good idea. Some blamed burning for drought, grasshopper infestations, and failed springs and streams. Even some academics denounced the practice. But cattlemen continued to burn because they knew firsthand that burning meant better grass for cattle. Today, there is wide scientific consensus that fire is a vital ecological process in

humid grasslands like the Flint Hills.

Grazing and fire, along with climate variability, were the primary ecological drivers that historically shaped the tallgrass prairie. Estimates of pre-1850 fire occurrence in tallgrass prairie vary, but most put the historic fire-return interval between two and five years. This equates to an average of thirty to eighty million acres that burned annually!

A primary ignition source was Native



PLOWING ON THE PRAIRIES
BEYOND THE MISSISSIPPI
Theodore R. Davis (1968)
Courtesy Kansas State Historical Society

Americans. In fact, aboriginal burning is thought to have resulted in an eastward expansion of the tallgrass prairie.

In the autumn of 1832, Washington Irving led an expedition into “Indian

Territory.” Near Stillwater, at the western edge of the Osage Hills (Greater Flint Hills), one of his companions wrote: “The prairie, two miles from our camp, is immense, imposing and superb. The grass is at times green and short and at other times tall and white. . . .” The short and green grass they reported likely had been preferentially grazed by

bison following a recent burn, whereas the tall and white grass was unburned prairie that had been left ungrazed. What Irving’s expedition unknowingly documented was the interaction of fire and grazing creating a mosaic of vegetative structure. Historically, bison, and to a lesser extent elk and pronghorn, served as



TOP: PRAIRIE ROAD OF TALLGRASS
PRAIRIE NATIONAL PRESERVE
Billy Robb

ABOVE: STARTING THE FIRE
Dave Leiker

keystone species in the tallgrass prairie; they played a key ecological function, much like a keystone in an arch. Cattle commonly fill that role today. Research at Konza Prairie Natural Research Area has shown that plant diversity increases under light to moderate grazing, compared to ungrazed watersheds. Also, preferential grazing creates beneficial variability or patchiness in vegetative structure (called heterogeneity), which in turn benefits wildlife.

Clearly, fire and grazing can be beneficial, but what’s the right mix?

Fire frequency varies depending on the type of livestock operation, local fire culture, and burning constraints, such as houses, highways, and difficult terrain. Many advocate a three-year fire-return interval to control woody plants and other undesirable species—a natural, herbicide-free method of tree and shrub control. Others burn more frequently, largely to enhance livestock performance of early season stocker cattle. While some areas of the Flint Hills receive more fire

than is perhaps ecologically necessary, tree invasion due to inadequate fire poses a greater and less reversible threat to the prairie. Much of the eastern flank of the Flint Hills has already been compromised by tree encroachment due to a lack of fire. Debate continues on when and how often to burn the prairie, but few argue the need for it.

No management practice other than fire affects the prairie more than stocking rate. Long-term overstocking not only results in palatable species being replaced with less desirable ones, it also reduces the ability to use prescribed burning, due to inadequate fuel to carry a fire. Because of the variability of climate, appropriate stocking rates are a bit of a moving target from year to year. An appropriate stocking rate should be based on landowner goals, the duration of grazing, size and type of animals, and estimated forage production (based on range condition and soil types). The old adage of “take half and leave half” [of the grass] is still a good rule of thumb. This



BRAHMAN WITH CALF
Don Wolfe

means that roughly half of the potential above-ground biomass is left standing to maintain root health of the dominant warm-season grasses. Forage production in a healthy pasture is substantially better during a drought than prairie that has been “pushed” the previous couple of years. Forward thinking ranchers view this unharvested forage as a kind of insurance policy against drought.

There are few examples in agriculture where a functioning system as productive as the Flint Hills can be sustained with so little effort and input. Where else can cattle commonly gain three pounds or more per day during the grazing season without the need for fertilizer, herbicides,

or irrigation? The only agricultural inputs are a few matches and a good knowledge of prairie management.

Tallgrass prairie is a resilient community of grasses, forbs, legumes, and woody plants. However, ill-advised management coupled with unfavorable weather can cause an undesirable shift in the native plant community. Since the early 1950s, range management experts have used three plant classifications—increasers, decreaseers, and invaders—to help evaluate rangeland health. Decreasers are species that generally decline under stress, whereas increasers tend to become more common or even dominant.

Plants that are undesirable or displace native species are called invaders. The greater the proportion of increasers and invaders, the poorer the health of the prairie. In contrast, high quality prairies have a higher proportion of decreaseers.

A similar but more refined method used by prairie ecologists to evaluate the quality or health of prairie is the Floristic Quality Index (FQI). Each species is given a “coefficient of conservatism value” for its tolerance of disturbance. The common sunflower, Kansas’s state flower, is a 0 because it can grow just about anywhere. Plants found only on healthy prairies typically have values of 7 to 10, and are considered to be conservative species. A high FQI score for a prairie site—meaning a high portion of conservative species—is indicative of diverse, healthy prairie.

My favorite perception of a healthy prairie is whether or not I would be radically disoriented if somehow I were transported back 200 years to the same location. Much of the Flint Hills have

remained nearly the same as when Pike traversed this flint-strewn upland in 1806. Many of today’s uninterrupted vistas would look remarkably familiar. Even a modern prairie botanist would recognize the plant community of two centuries past, even though conservative species would have been more abundant then. And trees and invasive species would be far fewer than today. But all and all, a botanist would not be disoriented but would know this place. It’s easy to imagine being back in time during Pike’s expedition and experiencing nearly the same prairie and vistas that he christened the “ruff flint hills.”

Brian Obermeyer, Director of The Nature Conservancy’s Flint Hills Initiative, works with ranchers, landowners, and other stakeholders to help preserve the biological integrity of this impressive landscape. He also oversees stewardship activities on 13,000 acres of Conservancy-owned land, including the Tallgrass Prairie National Preserve. Brian holds a master’s degree in Environmental Biology from Emporia State University.