



Kansas State University Libraries
New Prairie Press

Symphony in the Flint Hills Field Journal

2011 – Freedom's Frontier in the Flint Hills
(Laurie J. Hamilton, Editor)

An Introduction to the Flint Hills and the Tallgrass Prairie

Rex Buchanan

Brian Obermeyer

Follow this and additional works at: <https://newprairiepress.org/sfh>

Recommended Citation

Buchanan, Rex and Obermeyer, Brian (2011). "An Introduction to the Flint Hills and the Tallgrass Prairie," *Symphony in the Flint Hills Field Journal*. <https://newprairiepress.org/sfh/2011/nature/1>

To order hard copies of the Field Journals, go to shop.symphonyintheflinthills.org.

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

This is brought to you for free and open access by the Conferences at New Prairie Press. It has been accepted for inclusion in Symphony in the Flint Hills Field Journal by an authorized administrator of New Prairie Press. For more information, please contact cads@k-state.edu.



EMERALD HILLS
Jim Richardson

An Introduction to the Flint Hills and the Tallgrass Prairie

It was Zebulon Montgomery Pike who first coined the name Flint Hills when exploring the region in 1806. In his journal, September 12th, he described the following near the headwaters of the Verdigris River in southeastern Chase County: “Commenced our march at seven o’clock. Passed very ruff flint hills. My feet blistered and very sore.” He went on to say that from one view he could see buffalo, elk, deer, cabrie [pronghorn], and panthers.



Today one can still see many of the same unobstructed vistas that Zebulon Pike witnessed more than 200 years ago. The Flint Hills owe much of their persistence as a relatively unfragmented tallgrass prairie landscape to their ranching heritage, one that has perpetuated, in many cases, the natural

disturbance regime of fire and grazing. Thin soils and local geology (in the form of limestone, chert, and shale deposits) also meant that the region was better suited for ranching.

Some 285 million years ago, when these sediments were first deposited, Kansas looked a whole lot different. At that time,



OCEANS OF KANSAS PALEONTOLOGY
Map resides in University of Nebraska State Museum

much of the state was covered by a shallow sea. Eastern Kansas probably resembled the coast of Florida. (Geologists call these similar land formations “modern analogues”—or places you can go today to help us understand what things looked like in the past.) Kansas was also much closer to the equator than it is today. So these shallow, warm oceans teemed with life. Because these seas were shallow (likely less than a hundred feet deep) and the sea floor relatively flat, slight drops in sea level would expose broad areas as dry land, and slight increases in sea level meant that vast areas would be covered by water. In short, for millennia, the seas in eastern Kansas came in and the seas went out. When someone says that Kansas was once covered by an ocean, it would be more accurate to say that the state was

covered by a series of oceans.

These seas left behind sediments that eventually became layers of limestone and shale. Limestone is the sterner, generally buff, brown, or white rock that forms prominent benches in many pastures. Varieties of shale are generally darker-colored, gray or even red or green, and much softer. Visible along road cuts in the area, shale is often grassed over in Flint Hills pastures, and is not as apparent as limestone.

Then there’s the flint that gives the hills their name. Flint (also known as chert) is a dense, microcrystalline rock that is commonly found within some limestone layers. Because of its hardness, chert resists erosion. These rocks, and

the thin soils, also deterred plowing in the Flint Hills—the primary reason these hills have remained as native grass. An Osage Indian once said that the White Man will have a hard time putting that iron thing in the ground here [Flint Hills]. Chert also fractures with a characteristic sharp edge, which is why Native Americans used it to make tools and points, and why it can wreak havoc on car tires today.

Each of these rock layers has its own name, usually based on where it was first described. The thick, blocky Cottonwood limestone is named for Cottonwood Falls. Many of the rounded hills are capped by the Florence limestone, named for the small town



ROADCUT IN CHASE COUNTY
Elaine Shea Jones



Mark Feiden

in Marion County. The Fort Riley limestone forms a rimrock in pastures near Fort Riley.

Within these rocks are the remains of animals that populated those ancient seas. These are mostly invertebrates. Corals, clams, sponges, sea urchins. A wheat-grained shaped protozoan called a fusulinid. A star-fish relative called a crinoid. Even the occasional trilobite. All provide clues about the ancient environment in which the sediments were laid down.

In the time since those sediments were deposited, parts of the Flint Hills were again inundated by oceans, but mostly the region has been exposed to erosion.

While glaciers briefly (in geologic terms) covered the northern extension of the hills about 600,000 years ago, the hills south of the Kansas River were not glaciated. Thus, the valleys were not carved by glaciers, but by water that cut down through the draws over time.

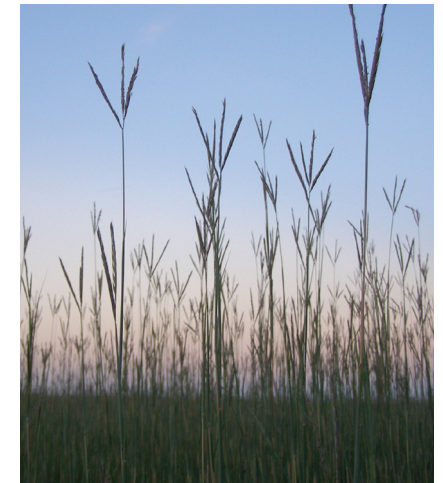
Though their geology may sound simple, the Flint Hills hold surprises. Water accumulates within the cracks, fissures, and pore space of the limestone, and shows up at the surface in the form of numerous springs and seeps. Some of the state's largest and purest springs, like Diamond Spring (Morris County), Rock Spring (Dickinson County), and Crystal Spring (Marion County) are in the Flint Hills.

With enough time, water has worn away underground channels in the limestone, and some of those channels are big enough to qualify as caves, several of which go thousands of feet back into the Flint Hills countryside. And in places, like Pillsbury Crossing, east of Manhattan, limestone ledges create impressive waterfalls.

The connection between the hills and water doesn't end there. Because so much of the Flint Hills remains in native grass, and because many of the streams here have gravel bottoms, the streams typically run clear, more like mountain streams than most silt-laden drainages in Kansas. As a result, the area holds many of the central plains' most pristine waters, supporting a rich variety of native fishes and a diverse assemblage of freshwater mussels.

The Flint Hills are also special because they represent the last functional landscape expression of tallgrass prairie, the most altered major habitat type in North America in terms of acres lost. Tallgrass prairie once stretched across approximately 170 million acres, but today less than four percent of the original tallgrass prairie remains. The Flint Hills encompass the single largest tallgrass prairie landscape remaining in North America, with more tallgrass prairie remaining here than in all the other prairie states combined.

Approximately ninety native grass species are found in the Flint Hills, with big bluestem, little bluestem, Indian grass, switchgrass, eastern gama, and sideoats grama being some of the more dominant species. But the Flint Hills are much more than grass. Over 500 native broadleaf prairie plant species (herbaceous forbs) have been documented in the Flint Hills. This rich floristic diversity is important for maintaining the ecological health of the prairie's natural communities. The region is especially important for grassland nesting birds,



BIG BLUESTEM
Michael Stubbs



Mark Feiden

such as greater prairie-chicken, eastern meadowlark, and upland sandpiper. The Flint Hills also serve as a staging area for numerous raptors, and comprise North America’s only north-south tallgrass prairie corridor used extensively by migrant birds.

Climate, grazing, and fire were the primary ecological processes that shaped the tallgrass prairie ecosystem. Weather patterns influenced the growth of vegetation, which in turn affected the availability of fuels for burning and forage for grazing. Historic herbivores, such as

bison and elk, preferentially grazed in recently burned patches of prairie, which in turn helped maintain the vegetation mosaic. American Indians also influenced these patterns and played a large role in shaping the historic landscape prior to Euro-American settlement.

The Flint Hills have recently gotten much deserved recognition as a national treasure. For example, The Nature Conservancy ranks the Flint Hills landscape as a priority conservation action site, the Kansas Natural Heritage Inventory rates the Flint Hills as the state’s No. 1 landscape

conservation priority, and the World Wildlife Fund recognizes the landscape as “one of only six grasslands in the contiguous U.S. that is globally outstanding for biological distinctiveness.” Most recently, the U.S. Fish & Wildlife Service (USFWS) announced the establishment of the Flint Hills Legacy Conservation Area, which authorizes the USFWS to purchase up to 1.1 million acres of conservation easements in the Flint Hills.



FARMER TOWNSHIP PASTURE
Mark Feiden

All of these organizations acknowledge what Kansans have known for years: The Flint Hills are a remarkable place, one that has been millions of years in the making, and one that deserves our understanding and respect today.

Rex Buchanan grew up near Little River, in Rice County, Kansas, on the edge of the Smoky Hills. He has an undergraduate degree from Kansas Wesleyan University and graduate degrees from the University of Wisconsin-Madison. He has been at the Kansas Geological Survey, based at the University of Kansas, since 1978, and is currently the Interim Director. He has been president of the Kansas Association for Conservation and Environmental Education (KACEE), the Kansas Academy of Science, and the Association of Earth Science Editors. In 2008, he was named a Fellow of the Geological Society of America.

Brian Obermeyer is the Director of The Nature Conservancy’s Flint Hills Initiative, a community-based conservation effort to help preserve the last large expanse of tallgrass prairie in North America – the Flint Hills. Brian works with ranchers, landowners and other stakeholders to help preserve the biological integrity of this impressive landscape. In addition to his work to secure conservation easements, Brian oversees stewardship activities at the Tallgrass Prairie National Preserve (owned by the Conservancy) and the Conservancy’s Flint Hills Tallgrass Prairie Preserve. Brian holds an M.S. degree in Environmental Biology from Emporia State University.