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The Tallgrass Prairie at Fort Riley

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FORT RILEY ELK HERD
Courtesy Fort Riley Directorate of Public Works

The Tallgrass Prairie at Fort Riley



Fort Riley – or Camp Center as it was originally named due to its proximity to the geographic center of the US – was first surveyed in 1852 to serve as a military post to protect traders moving along the Oregon-California and Santa Fe trails.

Situated at the junction of the Republican and Smoky Hill rivers, early Fort Riley and the surrounding countryside were comprised of unbroken prairie for as far as the eye could see, and then some. The only interruption of prairie was along timbered stream corridors and steep, wooded hillsides dominated by fire-scarred chinkapin oak.

The following is an address delivered in 1890 by Percival G. Lowe that provides a vivid description of the early character of Fort Riley and the surrounding landscape: “Of all charming and fascinating portions of our country,

probably there is none where nature has been so lavish as within the radius of 150 miles taking Fort Riley as a center. In rich soil, building material, in beauty of landscape, wooded streams and bubbling springs, in animal life, in everything to charm the eye, gladden the heart and yield to the industry of man – here was the climax of the most extravagant dream. Perfect in all its wild beauty and productiveness, perfect in all Nature’s God could hand down to man for his improvement and happiness.” Today, an impressive portion of Fort Riley (roughly 40,000 acres) remains as native prairie

and still mirrors the beauty of landscape that Lowe so eloquently described.

Native grasslands (tallgrass, mixed-grass, and shortgrass prairies) once covered much of the mid-section of North America, representing the continent's largest vegetative province. While this vast expanse of grass was greatly diminished following a surge of Euro-American settlement in the late 1800s, grasslands remain one of North America's most important ecological resources. The eastern third of this region is represented by the tallgrass prairie. Fort Riley is situated on the western edge of the tallgrass prairie, which once stretched across some 170 million acres, from Kansas east to Kentucky, and from Canada down to Texas.

Tallgrass prairie is characterized by higher rainfall than prairies to the west and is dominated by warm-season grasses like big bluestem, Indiangrass, switchgrass, and little bluestem. Tallgrass prairie is also well represented by herbaceous perennial forbs, like leadplant, roundhead

lespedeza, compass plant, and purple prairie clover. Roughly two-thirds of tallgrass prairie plants are long-lived, deep-rooted perennials. The root system of some of these plants can exceed fifteen feet in depth, with two to four times more biomass occurring belowground than above. These deep-rooted prairie plants assimilate nutrients and return them to the surface, creating over time some of the most fertile soil in the world. This soil-building recipe, multiplied over thousands of years, made the region prime for agriculture. In just a few decades, the majority of the tallgrass prairie was plowed to become the breadbasket for a growing nation. As a result of this unprecedented land conversion, tallgrass prairie is now the most altered major habitat type in North America in terms of acres lost. Less than five percent remains today.

Despite this loss, a significant swath of tallgrass prairie – the Flint Hills landscape – has been spared thanks to the underlying limestone that prevented plowing, along with a 150-year tradition



TALLGRASS PRAIRIE AT FORT RILEY, KANSAS
Courtesy of Craig Freeman, University of Kansas

Fort Riley has made a concerted effort in recent years to delineate sensitive habitats, including high quality native prairie, so that military exercises can be adjusted to minimize ecological damage.

of cattle ranching that maintained the land as native prairie. Roughly two-thirds of all remaining tallgrass is found in the Flint Hills of eastern Kansas and the Osage Hills of northeastern Oklahoma (southern extension of the Flint Hills). The Flint Hills represent the last landscape expression of tallgrass prairie. At Fort Riley, which is situated in the northwestern edge of the Flint Hills, one can still enjoy the same prairie vistas that Percival G. Lowe admired during the fort's early days.

While species like bison, gray wolf, raven, puma, and pronghorn are no

longer present, most of the original plant and animal species are still found here. One species absent for many years has since returned to Fort Riley. The North American elk (wapiti) has been reintroduced, and the herd is now estimated to number 150 animals. Elk are by nature a prairie species and would have been more numerous on the prairie prior to settlement than where most elk reside today. It becomes obvious that elk "belong" on the prairie once you've experienced the distant bugling of bull elk on a prairie dawn, witnessed a herd of elk forging through belly-deep, autumn-red bluestem, or discovered a massive antler shed near a limestone-capped ridge.

Because of the prairie that has been preserved, Fort Riley provides an important refuge for grassland-dependent birds. The greater prairie-chicken, Henslow's sparrow, grasshopper sparrow, dickcissel, Eastern meadowlark, and upland sandpiper are all common residents here. Fort Riley also serves

as a staging area for numerous raptors (e.g., bald eagle, red-tailed hawk, northern harrier, and short-eared owl) and is part of a north-south prairie corridor used extensively by migrants such as American golden plover, upland sandpiper, Smith's longspur, Sprague's pipit, and buff-breasted sandpiper. Other prairie obligate species found here include the regal fritillary butterfly and prairie mole cricket. Both are indicative of high quality habitat. Fort Riley is also an important aquatic site, with six streams harboring the Topeka Shiner, a federally threatened minnow that inhabits upland prairie streams.

Although Fort Riley receives enough rainfall (nearly 32 inches annually) to support a woodland-dominated plant community, historic fires gave grasslands a competitive advantage and kept forested areas confined to narrow corridors along streams and steep ravines. Frequent burning is an ecological necessity to prevent the encroachment of woody species and to maintain the integrity

of native plant communities. This is especially true in grasslands that receive high precipitation.

Lightning-caused fires drove the region's early beginnings as a fire/herbivore-driven plant community, but fire frequency is believed to have increased markedly after humans arrived. Burning by Native Americans may in fact have been the most significant ecological driver for the past few thousand years, and their use of fire is thought to have resulted in an eastward expansion of tallgrass prairie. Estimates of pre-1840 fire occurrence rates in tallgrass prairie vary from two to five times per decade. Assuming a three-to-five year historic fire-return interval, 30 to 60 million acres of tallgrass prairie may have burned on average each year!

In the absence of fire, deciduous trees have been shown to encroach into tallgrass prairie by as much as two percent annually. Without periodic prairie fires, Eastern red cedar can transform open prairie to an enclosed

canopy in less than forty years. Some speculate that woody encroachment may become even more problematic as atmospheric carbon dioxide levels continue to increase. Certainly, failure to routinely burn at Fort Riley would result in a rapid conversion from prairie to trees. Fortunately, the Conservation Branch at Fort Riley regularly uses prescribed fire to keep the prairie in a vigorous, healthy state; their preference is to burn at about a two or three year fire-return-interval to beat back woody encroachment. These prescribed burns are typically conducted when weather conditions are safe with adequate humidity and light winds. Other fires are sometimes ignited accidentally from military training exercises, often when conditions are hot and dry (when one would never consider a prescribed burn). While these wildfires can be unnerving to the say the least, they are actually quite beneficial, as they mimic more intense pre-settlement fires that are difficult to replicate safely. Wildfires

are most common in the 16,000-acre Impact Area of the installation where people are not permitted due to unexploded ordnance.

The history of Fort Riley has largely been a positive one for tallgrass prairie, but a less cheery story has recently developed, involving an invasive character called sericea lespedeza, a perennial legume native to Asia that was originally introduced into the United States in 1896 for use as forage and for erosion control. Sericea has become a serious invasive threat to the prairie since its introduction at Fort Riley in the mid-1980s. A recent survey found that sericea lespedeza now infests approximately nineteen percent of native prairie acres (not counting the Impact Area), an increase from eleven percent a decade ago. The data suggest that sericea lespedeza is increasing in distribution and abundance at Fort Riley despite control efforts. Control of sericea lespedeza has been especially challenging, as the herbicides used to

control it can be injurious to non-target, broadleaf plant species.

Despite this cloud of uncertainty for Fort Riley prairies, the installation still proudly boasts *the* single largest public ownership of tallgrass prairie in North America. The 40,000 acres of native prairie that has been preserved here is roughly four times as much prairie as contained in the Tallgrass Prairie National Preserve, for example. A recent Kansas Biological Survey ecological ranking assessment noted that nearly eighty percent of the prairies on Fort Riley were of A-grade or B-grade condition. The larger of these prairies, which generally received the highest ecological score, are concentrated in the south, east, and northwest portions of the installation. Native prairie is most abundant in areas with topographic relief, whereas areas with less relief have experienced a higher incidence of past cultivation.

Fort Riley has made a concerted effort in recent years to delineate sensitive habitats, including high

quality native prairie, so that military exercises can be adjusted to minimize ecological damage. We are fortunate that Fort Riley has made preservation of tallgrass prairie a high priority, but perhaps the best way to preserve this national treasure is through education and appreciation of the prairie. By continually drawing attention to the ecological significance of this landscape and the uniqueness of its culture, the likelihood is strong that the tallgrass prairies of Fort Riley and the larger Flint Hills will stand the test of time.

Brian Obermeyer is the director of The Nature Conservancy's Flint Hills Initiative. 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 on 13,000 acres of Conservancy-owned land, including the Tallgrass Prairie National Preserve. Brian has a Master's Degree in Environmental Biology from Emporia State University.