

Missouri Grasslands and Fire

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The first European visitors west of the Mississippi River were the French, so to them went the honor of naming this vast grassland so different from what they had seen before. The English term "meadow" had come to apply to wet grassland on the Atlantic Seaboard and in the glaciated states. The term did not fit these dry rolling grasslands. The French used "prairie", their word for meadow, to denote both wet (*prairie basse*) grasslands, composed mostly of prairie cordgrass, eastern gamagrass, switchgrass, sawtooth sunflower and cupplant (Figure 1), and



Fig. 1. Bottomland prairie or prairie basse. Only about 350 acres remain in Missouri of this plant community.

dry (*prairie haute*) grasslands, composed of big bluestem, indiagrass, little bluestem, prairie and tall dropseed, leadplant, slender lespedeza, rosinweeds and ashe sunflower (Figure 2) (Steyermark 1959, 1963). By the time other explorers and settlers arrived, maps of the St. Louis and St. Charles area already carried such names as Prairie la Joye, Prairie des Noyers, Prairie les Biches and Premiere Prairie (Schroeder 1981).

While prairie meant grassland, that in Missouri was not necessarily treeless. Plum thickets, sumac and isolated post, blackjack, and burr oaks were all part of the prairie. (Schroeder 1981). It was understood, however, that prairie had definite limits, i.e., it was bounded by forest, a geographically distinct tract of land. When Lewis and Clark left the western border of Missouri in 1804, the term "prairie" was left behind and "plains" or "great plains" was used for the endless sea of grass to the west.

Joseph Mudd, an early settler in Lincoln County, in northeastern Missouri, reminisced in 1888: "*Lincoln is the best timbered county in North Missouri.... When the county was first settled there was no underbrush or small timber*



Fig. 2. Dry upland prairie or prairie haute. About 15 million acres once covered Missouri but only 70,000 acres remain. A publicly owned prairie, managed by grazing, haying and burning will be a tour stop at the '93 Summer meeting in Springfield, Mo.

such as now exists. The timbered lands were open, the trees standing so far apart that the hunters could see the deer at distances from one to five hundred yards. The entire surface of the country was then covered with a rank growth of vegetation, consisting of the native grasses and wild flowers, which gave the landscape, especially in the timbered lands, a much more beautiful appearance than it now has." (Mudd 1888).

Thomas Dockery described nearby Adair County in 1855: "*In the timbered portions of the county, there was absolutely no brush. The trees were very massive and the ground underneath was covered with prairie grass. The massive trees, the prairie flowers and grass all combined to make a truly beautiful and inviting country.*" (Violette 1911). According to surveyor records, Adair County was 47% prairie (Schroeder 1981). Other north Missouri counties ranged from 11% to 83% prairie. Previous descriptions of open woods and grasslands with large massive trees was probably similar in those countries.

The Ozarks

French and English travelers felt "prairie" didn't fit the grassy Ozark woodlands and grass openings. "Grassy" was used for narrow treeless hollows and "bald" for treeless knobs. "Barrens" was applied to extensive grass-covered tracts of the Ozarks although "prairie" was probably more appropriate. "Barrens" in the Appalachians of Kentucky and Tennessee denoted thin, poor or rocky soil, or bedrock, unable to grow trees. "Glades" referred to forest openings on steep hillsides. "Savanna", a Spanish

word for grassland with trees, was not used at all in the 19th century but is today to refer to open forests with 30 to 80% canopy and prairie and shrubby or grassy under-story. (Figure 3).



Fig. 3. Savanna, rare in Missouri today but common in presettlement times. Efforts to restore this unique plant community have only recently begun.

Numerous early accounts refer to the openness of the forests of the Ozark plateau. Henry Rowe Schoolcraft (1819, 1821) described the Ozark as: "...a succession of hills of moderate elevation, covered chiefly by oaks and without underbrush. A tall, thick, and rank growth of wild grass covers the whole country, in which the oaks are standing interspersed, like fruit trees in some well-cultivated orchard, and giving to the scenery the most novel, pleasing, and picturesque appearance."

Houck (1908) described the Ozark woodlands as: "...open woods and a growth of wild prairie grasses and flowers filling the broad spaces between the trees....All the forests were free from undergrowth, and open and park like in appearance."

Even dense woods were substantially different than we think of them today. Roof (1913) wrote of the Grand River floodplain and available grazing of Livingston County: "The extensive bottoms on both sides of Grand River were covered with a heavy growth of timber of various kinds, and furnished luxuriant range for stock". Modern concepts of "heavy timber" would seem to be incompatible with the "luxuriant range for stock". C.R. Barnes (1879) stated, "Bottom prairies...(have) productive soil clothed with luxuriant native grasses.... Before these savannas were pastured the grasses grew to a height varying from five to ten feet." The editor of the 1884 *History of Callaway County* said of the "more than 50 varieties" of native grass. "Native herbage will put on more flesh on cattle from beginning of April to early autumn than the domestic grasses."

The Role of Fire

Fire, both from lightning strikes and Indian sets, had a significant hand in creating this landscape that has changed so drastically since European settlement. There are numerous reports of Indians annually burning the landscape, usually in autumn after leaf fall. Joseph Mudd (1888) wrote of Lincoln County: "Annually, after this rank growth of vegetation had become frosted, dead, and dry, the Indians set fire to it and burned it from the entire surface of the country. When this annual burning ceased, the germs of underbrush and young timber began to grow...."

From Schuyler County, in extreme northern Missouri, written the same year: "For many years prior to the settlement of the country, it had been the custom of the Indians, after the frost had killed the rank growth of vegetation, especially the wild grasses, and it had become dry, to set fire to it, and thus burn over the entire surface of the ground. This annual burning destroyed the young germs of forest trees and prevented a dense growth of timber; so, when the early settlers came, they found no undergrowth of timber. The forest trees, nearly all of which had a short, scrubby growth, stood far apart, and, there being no underbrush, the forests were so open that the deer could be seen for hundred of yards, and the pioneer could ride and drive through the timber without any difficulty. It is not so now, a gradual but distinct change having been brought about. Soon after the settlement began the annual fires ceased to occur, and as a consequence the young timber began to grow." (Stevens Publishing Co. 1888 In: Ladd 1991)

Sauer (1920) wrote of the Ozark region: *Indians and other hunters...set fire to the grass in the fall or spring in order to improve grazing for buffalo, elk and other big game. Fires were also set to drive the game towards the hunters. Through this practice sprouts and tree seedlings were killed.*

Early settlers described fall in Missouri as beautiful and comfortable but it was also a smoke-filled time of year. Elizabeth Ann Cooley, of Jackson County, recorded in her journal October 4, 1846, "Tis clear and very smoky..." Tuesday 6th.... "it has been a very windy day...the moon looks red in the smoke..." Sunday, 25th October, "It's windy and smokey. Friday, the fire burned the prairie all up most (SIC), and all the Wilmotts and Kenny's fence and wheat." (Jervey and Moss 1966).

Putting all in perspective, Pyne (1982) writes: "the dominant vegetation type in North America may well have been grassland or open forest savanna. The role of fire in sustaining these landscapes is incontestable; when broadcast burning was suppressed as a result of European settlement, the land spontaneously reverted to forest... The transformation of grasslands, prairies, and savannas into forests is one of the most fundamental and widespread outcomes of European colonization."

The Last Century

With the breaking of the prairie sod, overgrazing of the prairies, introduction of Eurasian cool-season grasses, and the accumulation of property, fire virtually disappeared from north Missouri. South Missouri, however, continued to be burned by early settlers but these fires were much lower in intensity than Indian set fires. Dendrochronology studies by Guyette and McGinnes (1982) on old growth cedars on protected sites of southwest Missouri glades indicate a fire frequency of 3.2 years. Low intensity fires do not produce a fire scar, so actual fire frequency was probably much greater. Postsettlement years show a dramatic reduction in fire frequency in spite of a relatively high occurrence of incendiary burning by local residents. Heavy grazing of prairies and woods by domestic livestock did not allow fuels to accumulate to produce the hot fires common in presettlement time. Fires were hot enough to cause fire scars on hardwoods but not to consume dead snags. Local residents recognized that it was no longer safe to have the intense fires that had kept the forest at bay.

"The ritual of spring woods burning reached a peak in 1930 at which time most of the virgin forests had been cut and every hollow had several families scraping out a living. They lived in 2 or 3 room cabins, kept a few chickens (usually in an old school bus), raised a garden and ran some hogs and cattle on the open range. Improved pasture wasn't available and if it had been, they had no money for fertilizer. It took 40 acres to graze a cow but, then, there was lots of land." (Halliwell 1991)

Fire Control

Fire control was first attempted in 1925 when the Missouri General Assembly created the office of State Forester. That effort ended in 1933 when the state forester resigned, concluding that fire control was *"impossible in the Ozarks"*.

The Conservation Commission was established in 1936 and forest fire protection districts organized in 1938. A two-pronged attack was proposed. First they would detect and fight the fires that burned an average of 1/3 of the forested area of the state each year. Second they would educate the residents on the value of fire prevention.

Over the years, fire control became more proficient and the ranks of the dedicated woods burners thinned out due to being converted or outlived. By the 1949–50 fire season, less than 1% of Missouri timberland burned. Fire in the woods and the grasslands was considered *"bad business"*.

By the late 1960's however, the effect of fire removal from a million acres of glades and the remaining quarter million acres of prairies was beginning to show. Cedar and introduced cool-season grasses were altering thousands of acres of glades and prairies. A new message was being whispered in the 1970's: *"Fires aren't all bad but some are better than others."*

"This was not a welcome message to the Conservation Department and U.S. Forest Service employees who had spent their entire careers preaching against and putting

out fires. Even if fire had possibilities as a management tool, how would the people they'd been preaching to react when they saw them setting fires instead of putting them out?" (Halliwell 1991)

Nevertheless, the Forest Service and Conservation Department began experimenting with prescribed burning to restore and manage the rapidly dwindling prairie resources. Plantings of native grasses were made to replace lost native grassland habitat and provide summer grazing for livestock in a state that had, almost without notice, been completely converted to introduced cool-season grasses.

Current Practices

After a few years of relatively incident-free prescribed burning by U.S. Forest Service and Missouri Department of Conservation (MDC) personnel on public land, training sessions were organized to develop burn bosses. Related agencies such as Department of Natural Resources, Army Corps of Engineers and Soil Conservation Service (SCS) also sent personnel for training. Eventually, a proposal was made by SCS and MDC to begin training private landowners to burn their prairies and native warm-season grass plantings. This caused considerable discomfort among foresters but to the surprise of many, the capacity of their fellow citizens to accept and safely apply fire was underrated.



Fig. 4. A prescribed burn on a private hay prairie after a year of rest.

Nearly 500 government employees have been trained in prescribed fire management. Training includes three-day indoor technical sessions, planning and conducting their own burns, and participation in private and public land burns with experienced crews. Landowners receive training through a three-hour slide and video program conducted by SCS or MDC employees and by participating in training burns on their own or neighbors' lands. Afterwards they organize their own burning crews, sharing equipment and labor. They burn native prairies used for hay and pasture (Figure 4) and conservation reserve plantings which, not being hayed or grazed, would deteriorate under heavy residue accumulation.

Experience is gained with every burn which contributes to increased safety and effectiveness of burns. Much of the ground that was lost during the era of fire control and that of low intensity incendiary burning may never be restored. However, fire that once renewed and nourished our native grasslands prior to European settlement has once again taken its rightful place in the management of Missouri's natural resources.

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Cooperation and Commitment for Improved Relations and Range Conditions

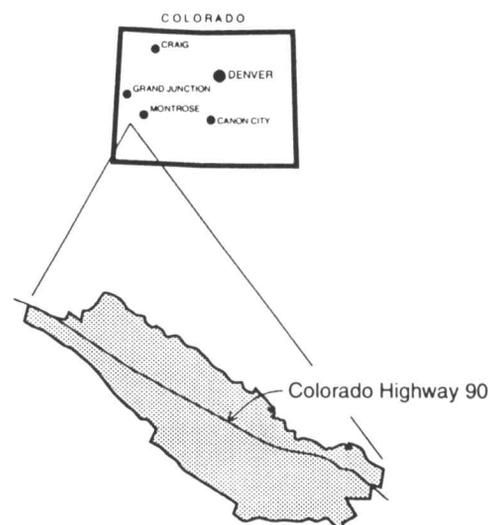
James Sazama

Grazing allotments on public lands administered by the Bureau of Land Management (BLM) range from greasewood flats to alpine tundra. When an allotment management plan (AMP) is prepared for an allotment, one problem usually identified is poor livestock distribution. There are many causes for this problem and vary with each allotment. The most common causes are:

- lack of water in an area which precludes livestock use;
- a seeding project that draws livestock to high quality nutritional forage;
- rough country and steep slopes which are grazed last, if at all; and
- a riparian area attracting livestock, like a magnet, to food, water, and shade.

One thing that can often interfere with solving livestock distribution problems is a lack of commitment by ranchers and BLM range conservationists to take action. This commitment has to be accompanied by excellent communication between the two parties or else the problem is not solved and often gets worse. Without open communication and a "win/win" attitude, it can be very difficult to solve distribution or other problems on public lands.

In the Uncompahgre Basin Resource Area of BLM's Montrose District in southwest Colorado (Figure 1), there is an example of what communication and a "win/win" attitude did to solve a distribution problem on the East Paradox Allotment. Local BLM range managers felt that by using a cooperative approach, any grazing-related



problem could be successfully overcome.

The East Paradox Allotment includes 16,250 acres of public land and about 2,600 acres of private land (Photograph 1). The climate of the area is semi-arid with hot summers and relatively mild winters. The most dependable precipitation occurs during the summer period, and brief high intensity thunderstorms are common. Plant greenup generally begins in March for native cool-season grasses. Vegetation consists of sagebrush, fourwing saltbush, galleta grass, cheatgrass, needle grass, and sand dropseed. About 500 acres of sagebrush were plowed in 1944 and another 350 acres plowed in 1984. Wheat-