

FIRE:

An Ally To FLINT HILLS Ranchers

Controlled burning is a tried and true method of tallgrass prairie management.

by Troy Smith, field editor

He is more often associated with Colorado and the mountain bearing his name, but Zebulon Pike left his mark on Kansas. Leading an 1806 expedition to the southwestern reaches of territory gained through the Louisiana Purchase, the U.S. Army officer and explorer traveled through the area that would become Kansas. Pike's journal entries from that trip contain the first known reference to the "Flint Hills".

That ragged strip of rough hills reaches across eastern Kansas, top to bottom, and spills over into northeastern Oklahoma. Pike thought the area was unfit for agricultural production. Not only was the rocky soil a barrier to the farmer's plow, but the stark absence of trees also indicated a lack of fertility. At least, that was an accepted theory in the early 19th century. Consequently, Pike couldn't see value in a hilly country covered with grass.

Later, explorers and early settlers came to understand the Flint Hills better. They learned how Native Americans periodically set portions of the prairie afire to refresh the growth of grass and attract migratory bison herds — a strategy believed to have been practiced for thousands of years. Whether kindled by men or initiated by lightning strikes, fire occurred often enough to maintain an almost tree-free grassland ecosystem. Additionally, the grass grew tall, thanks to precipitation ranging from 28 to 35 inches (in.) per year.



The Flint Hills were just a small part of the tallgrass prairie ecosystem that once dominated North America's heartland. By 1900, most of the tallgrass prairie had come under cultivation, but the Flint Hills resist it yet.

Much of its 10,000 square miles still remains unplowed and covered in native vegetation — mostly deep-rooted, perennial grasses. Big bluestem, little bluestem, Indiangrass, switchgrass and sideoats grama are the dominant species. Livestock grazing continues to be the dominant agricultural pursuit in the area. Like their forebears learned from native peoples, Flint Hills ranchers still use fire as a management tool.

“The ecosystem evolved under the influences of climate and animal impacts on plants and soil, including the actual grazing of the plants, plus the hoof action and manure deposition of grazing animals. Fire was a big factor. The native grasses are adapted to frequent fire,” says Flint Hills rancher Barb Downey. “It's hugely complex, but all of those things worked together to make these grasslands. And controlled burns are important to sustaining them.”

COMMITMENT TO MANAGEMENT

Downey Ranch, near Wamego, Kan., is home to the fourth-generation rancher; her husband, Joe

Carpenter; and their daughters, Anna and Laura.

Including both commercial and registered Angus, the ranch maintains some 550 brood cows and markets both seedstock and finished cattle. Like many Flint Hills operations, the ranch includes some acreage whose soil and topography make farming feasible.

“We raise some feed,” Downey says, explaining how home-grown grain and forage crops provide feedstuffs for backgrounding calves prior to sending them to a finishing yard.

Hay is grown for supplemental feed, and cool-season forages are planted for grazing. Along with crop residues, they complement the warm-season native pastures to provide for year-round grazing of the breeding herd with minimal supplementation. Downey emphasizes it's the native grass that forms the foundation of their ranch and the vast majority of Flint Hills grazing operations.

“We're committed to managing it well, with carefully planned grazing and smart use of fire,” Downey says, noting fire's importance in controlling woody species, especially eastern red cedar.

“We use chemical and mechanical measures, too, but prescribed fire is the most cost-effective, while providing other benefits to the soil and the

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grass. It gets rid of old ground thatch and helps recycle nutrients,” Downey says. “People that don’t understand its historical role and how fire can be a good thing are afraid we’re destroying habitat. But controlled burns help maintain habitat for wildlife adapted to the prairie.”

According to Kansas State University (K-State) Range Management Specialist Walter Fick, it was during the years following the Civil War that Flint Hills cattlemen recognized how high-quality forage regrowth, following fire, afforded increased weight gain in grazing cattle.

Fick says K-State scientists began studying how the use of fire could affect animal performance around 1918, with results first published in the ’20s. Later, researchers looked at stocker cattle gain response following controlled burns conducted in early-, mid- or late spring, or during the winter. They found that timing of the burns mattered.

“Comparisons were made in studies conducted from 1951 to ’67,” Fick says. “Results showed that late-spring burning resulted in the greatest positive response — up to 32 pounds of additional gain, compared to gains achieved on unburned pasture. We continue to see that kind of response today.”

The increased stocker gains only occur during the

grazing season immediately following a burn, and do not carry over to subsequent years if a pasture is left unburned. Consequently, Fick says, many stocker operators will burn all or most of their pastures annually. However, cow-calf producers typically do not see a significant boost to calf weaning weights as a result of annual burning.

FIRE IN THE FLINT HILLS

So cow-calf operations, like Downey Ranch, often burn every second or third year — often enough to prevent or reduce encroachment of brush and trees and maintain the dominance of warm-season grasses in their pastures.

According to Fick, Flint Hills landowners normally burn 2 to 2.5 million acres of grassland per year, with most burns occurring in April, just ahead of grass green-up. During Spring 2021, however, a total of 1.9 million acres were burned. There were too few days when the weather was dry enough and winds weren’t too strong. The window of opportunity for burning is narrow because weather conditions have to be conducive to an effective and safe burn. Fick says the normal “prescription” for a controlled burn calls for air temperatures ranging from 50 to 70 degrees Fahrenheit (F), 40-70% relative humidity and wind speeds of 5 to 15 mph.

Downey Ranch’s Joe Carpenter says area associations or burn groups consist of neighboring ranchers working together, sharing the labor and equipment necessary to conduct prescribed burns. They coordinate with local fire departments and emergency management officials to schedule burns on days that conditions are right.

“Typically, we put together a block of adjacent properties that belong to multiple landowners, using roads as boundaries for the total area designated for burning,” Carpenter says, explaining that collaborating to burn large blocks of land is more efficient, making better use of collective resources and the limited number of days when conditions are acceptable. “This year, our group held four burns, with each including about 3,000 acres.”



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— Barb Downey

MAINTAINING THE GRASSLAND

by Sarah Harris, editorial intern

Imagine you're driving through the heartland of Southeast Kansas, the land before you a vast expanse of beautiful foliage and bright blue sky. It's a warm spring day, the sun high overhead, despite the brisk March air and the gentle wind stirring the grass alongside the road. The wispy green strands dance with unbridled freedom as you edge the vehicle deeper into what used to be the nature preserve.

Driving through the Flint Hills, you see a sign designating this immense stretch of land as the tallgrass prairie. However the prairie is no longer just an ecosystem composed of native grasses. The hillsides are speckled with dark green coniferous trees, their canopies reaching towards the bright blue sky the way those sharp, glowing red flames did years ago.

This hypothetical prairie doesn't exist, but the recent encroachment of the eastern red cedar could lend itself towards becoming a reality. One of the most effective ways to prevent the forestation of eastern red cedar trees is through prescribed burning, says Joe Carpenter, seedstock and commercial cattleman from the Flint Hills in Eastern Kansas.

"We do a fair amount of prescribed burning — it's a tool that's important for this area," Carpenter says. "It keeps the eastern red cedar trees out, it keeps other [invasive] species out, it invigorates grass to grow and mainly, it's brush control — keeping this a grassland."

Together with his wife, Barb Downey, and daughters Anna and Laura, the family operates Downey Ranch near Wamego, Kan., growing crops and managing approximately 550 head of cattle. The entire family is adamant prescribed burning is the solution for preserving the natural landscape and eradicating invasive species such as the eastern red cedar that plague the prairie.

Barb Downey calls the eastern red cedar a "plant out of

place." Even though it is a native species, the eastern red cedar can grow out of control without rangeland burning, a practice that has taken place on the tallgrass prairie since the beginning of time.

Dependent upon managing strategies, the eastern red cedar can rampantly spread across the prairie, invading the landscape of indigenous grasses and native ecosystems.

"We live in a unique part of the country where prescribed burning has always happened," Downey says. "The Native Americans, going back thousands of years ago, set deliberate fire, attracting bison to fresh green, newly growing grass."

Downey says white settlers adopted these same tactics to graze their cattle, and lightning strikes frequently set fire to the grasslands, naturally ridding the prairie of underlying brush and potentially invasive species.

"This ecosystem is developed in concert with fire," she explains. "Fire is one of the legs of the stool that enables this ecosystem to function."

Without prescribed burning, Downey says invasive and noxious species will change the entire ecosystem of the natural landscape.

Carpenter says the eastern red cedar is a threat to the prairie because of its extreme consumption of water and grass space. If left alone, eastern red cedar trees will populate into a forest in about 20 years.

Downey says eradicating the eastern red cedar and maintaining the natural grassland is integral to preserving the tallgrass prairie and their family's cattle outfit.

"We're proud of continuing the legacy of maintaining the prairie with fire," Carpenter says. "It's a lot easier to maintain a prairie than try to bring it back."



When organizing controlled burns, Flint Hills ranchers are encouraged to make use of the smoke model available through the Kansas Flint Hills Smoke Management website (ksfire.org). This mobile device app predicts the direction that smoke plumes from controlled burns may be expected to drift based on weather conditions. Heavy smoke can be a concern among some residents of downwind cities. Carpenter thinks conscientious landowners try to be considerate of how the smoke may affect their city cousins. He hopes, in turn, urban-dwellers will try to understand the reasons for using prescribed fire in the Flint Hills. As a member of the local volunteer fire department, he reminds them of another reason worth consideration.

“Controlled burning also serves as a deterrent to wildfire,” Carpenter says. “If we don’t mitigate fuel loads on grasslands (buildups of old decadent vegetation), then Mother Nature will.”

K.C. Olson, a K-State specialist in range cattle nutrition and management, says researchers are looking for ways to remedy the air quality problems sometimes associated with the traditional spring burning period. They are looking at the pros and cons of alternative burning seasons. Late summer or fall (mid-August through September) burning offers some advantages. Olson says there is interest among some large stocker operators that use high stocking

rates but short grazing seasons. Typically, they ship cattle by late summer, so residual grass in the vacated pastures could be burned.

“This alternative to spring burning also works for managing invasive woody species and enhances forage production. Some native species seem to respond even more favorably to late-summer burns,” he says. “Studies also show that late-summer burning controls sericea lespedeza and some other invasive weeds, like Old World bluestems, that often survive spring burns.”

If some producers can conduct effective burns in late summer, perhaps fewer acres would have to be burned in the spring, on the few days that conditions allow. Concentrated burning in the spring, when days are warm but nights are quite cool, can result in heavy smoke plumes that hug the surface of the ground and dissipate slowly. By contrast, Olson says late-summer nights are warmer and smoke dissipates more rapidly.

Joe Carpenter thinks late-summer burning will be a hard sell to cow-calf operators or any rancher who needs to graze longer, but it could catch on among stocker operators that have emptied pastures by that time of year.

“If it means fewer total acres burned in the spring, it should lessen the air quality impact,” Carpenter says. “That would be a good thing.”

Many Flint Hills natives find it interesting their use of fire is a curiosity to producers in other parts of cow country. It’s ironic, in a way, because it’s in those other parts of the country where fire’s role in sustaining grasslands was lost and replaced by a culture of fire suppression. Eastern red cedar encroachment occurring in many Plains states is making some producers reconsider their fear of fire. Some of them are looking to the Flint Hills as an example of how prescribed fire can be an ally.

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or visit www.angus.to/flinthills for photos of the Flint Hills and to hear from Barb Downey and Joe Carpenter of Downey Ranch.

