

Spirit Mound Trust News

P. O. Box 603 | Vermillion, SD 57069 | info@spiritmound.org | www.spiritmound.org | December 2022

Was the Fire Good?

By Meghann Jarchow

On April 10th 2022, I saw plumes of smoke rising into the sky from my house. It was an extremely windy day, and the weather was very dry. I assumed it was an accidental fire because I could not imagine that anyone would intentionally start a fire under those conditions. I did not even consider that Spirit Mound could be on fire, but it was. (for more information about the fire, see the article on page 3)

The resulting landscape looked so black and dead, yet the burn was good for the prairie in many ways. By removing the dead aboveground biomass (called thatch), the fire allowed more light to reach the soil surface. This can give seedlings, which otherwise would be shaded, an opportunity to grow. The black ash on the soil makes it warm more quickly. Although prairie plants are generally efficient at moving nutrients from the aboveground parts to the roots in the fall, there are still nutrients in the aboveground biomass. The fire returns many of those nutrients back to the soil. Fire also kills most young trees. One disadvantage of fire, however, is that it kills the animals that are not able to move out of the burning area.

Tallgrass prairies are a unique, plagioclimax ecosystem. This means that they require disturbance to be maintained. The tallgrass prairie requires disturbance because it occurs



Photo by Mark Wetmore

Fire at Spirit Mound on April 10, 2022

in regions where there is generally enough precipitation to support tree growth. If Spirit Mound did not have some sort of disturbance, which historically was fire and animal grazing, it would likely become a forest.

The management of tallgrass prairies today, however, is very different from historical prairie functioning. We no longer have vast grassland fires that burn thousands of acres. The “numerous herds of buffalo” and “upwards of 800 in number” of elk that Lewis and Clark saw from Spirit Mound no longer roam and “disturb” the prairie.

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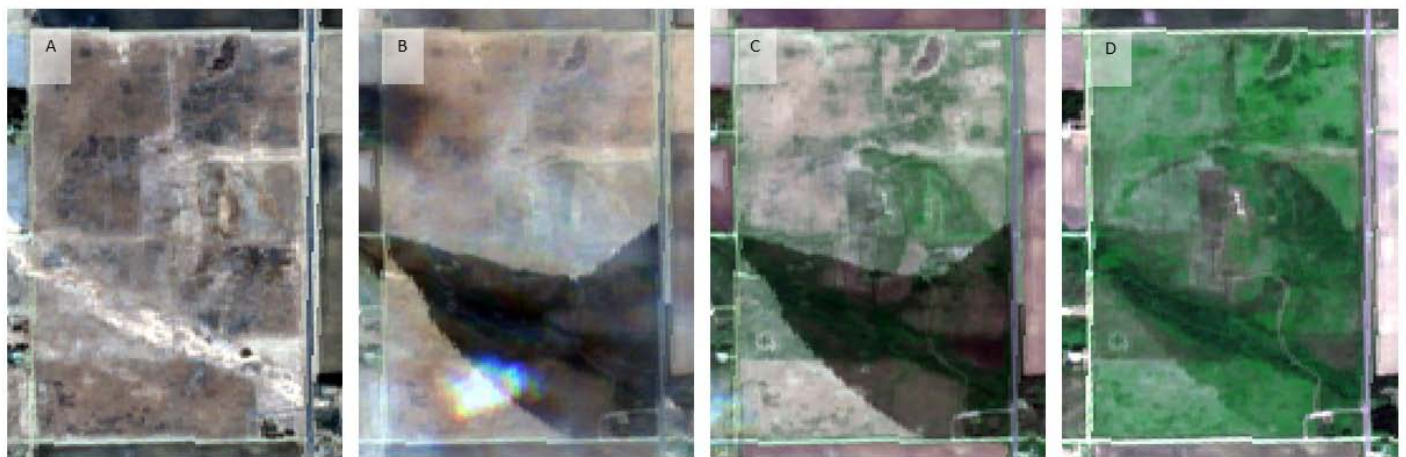


Figure 1. Aerial images of Spirit Mound from (A) March, before the fire; (B) April, after the fire; (C) May; and (D) June 2022. The black areas in panels B and C are the burned area. Images were taken by the Sentinel-2 satellite and were processed by Khushboo Jain, PhD student at the University of South Dakota.

How can we disturb the prairie today?

Although the conditions during the April fire were far different from a prescribed burn that would be conducted today, we still use fire as a management tool at Spirit Mound. The South Dakota Department of Game, Fish and Parks (SD GF&P) coordinates the prescribed burns at Spirit Mound. These burns are only conducted when the conditions are appropriate (for example, when there are low wind speeds with sufficient humidity), and many safety precautions are followed, including mowing fire breaks and using trained personnel with the required equipment. The current burn plan for Spirit Mound divides the site into three sections, each of which should be burned once over a 5-year period.

In addition to burning, mowing is a commonly used form of disturbance at Spirit Mound. Mowing can be especially useful at sites like Spirit Mound because the size of Spirit Mound is sufficiently small to make mowing manageable, and the timing of the mowing can be selected based on specific management needs. We use mowing at Spirit Mound to control invasive species including sweet clover, Canada thistle, smooth brome and small trees. We also use mowing

to knock back the fast-growing annual plants (AKA weeds) in the former feedlot so that the slower-growing prairie plants can become established.

Manual tree cutting and herbicides are two other forms of disturbance that are used at Spirit Mound. In many prairies, people use cows, goats, and/or sheep to provide disturbance, but so far, we haven't heard from SD GF&P that they want to introduce roaming herds of animals at Spirit Mound.

We hope to never have a fire like the April fire at Spirit Mound again because of the danger it posed and the damage it caused. We are, however, looking for additional help at Spirit Mound so that we can accomplish more of the small-scale—and often labor-intensive—disturbances described above on a more regular basis. This will include SD GF&P hiring another seasonal employee at Spirit Mound, and Spirit Mound Trust continuing to organize tree-cutting events in collaboration with SD GF&P. If you might be interested in helping with any of this, please contact me (Meghann.Jarchow@usd.edu). We can replace the “numerous herds of buffalo” with herds of volunteers.

Honored Visitors

By Mark Wetmore

For the past two summers, Spirit Mound Trust has been holding informal monthly meetings at the Mound, with members who can come, along with Bill Ranney our seasonal worker, and a representative of the Parks Division. These on-site meetings are an opportunity to talk about what's happening during the season and to plan for what may need more attention.

Twice this year we also had the opportunity to host visitors during these meetings.

Kristina Coby, the South Dakota Parks & Wildlife Foundation's new Executive Development Director, and Stephanie Rissler, a member of the Game, Fish & Parks Commission, spent a May morning with us. It was a great opportunity to talk with them about our successes and challenges at the Mound.



Meghann Jarchow, Stephanie Rissler, Kristina Coby

In June, Fhiliya Himasari, a fellow with the Young Southeast Asian Leaders Initiative program from North Sumatra, Indonesia, came to our meeting. Fhiliya, who spent four weeks working with Meghann Jarchow, was interested in learning more about how the successful partnership between Spirit Mound Trust and SD Game, Fish & Parks works. We talked with Fhiliya about the wildlife at the Mound, but she may not have been very impressed. There are elephants where she lives!



Fhiliya Himasari

Our Prairie Fire!

By Mark Wetmore

It's generally believed that occasional fire is beneficial for prairie plant species. Fire was part of their environment for thousands of years; started either by lightning or by Native Americans for signaling or for improving grass growth to attract the buffalo.

Controlled burns are a standard management tool for managed prairies, though the death of animals and insects is unavoidable collateral damage. (The Parks Division has agreed to keep the five-acre prairie remnant area on the west side of Spirit Mound permanently fire free, to serve as a refuge, especially for the invertebrates living there.)



Though a burn was planned at the Mound for this spring, happenstance intervened and it wasn't necessary. On a very windy Sunday afternoon, April 10th, a fire, previously thought to be extinguished, in a farmyard a mile west-northwest of the Mound, came back to life and roared one and a half miles southwest. The smoke was spectacular even from Vermillion.

Almost one third of the Spirit Mound site was burned. The fire killed several large trees by our parking lot, significantly damaged our garage, and threatened the Daryl Johnson home across Highway 19 before firefighters finally stopped it.

The Mound would have lost its dedicated tractor, purchased by the Trust in 2017, if not for some brave, quick-thinking by Bill Ranney, a retired archaeologist who serves as our seasonal worker at the Mound. He and his wife Doris Peterson live just a quarter mile south of it. Though concerned for the fate of their own home, when they saw the fire bearing down on the parking lot corner of the Mound, they drove there; and Bill moved the tractor to their yard. The fire greatly damaged the garage's back wall and interior. If the tractor had been inside the garage, the entire structure could have been destroyed.



Bill Ranney

By the end of the growing season the only obvious fire impact was to knock down the more-than-troublesome volunteer trees. Native grasses seemed to be doing relatively well, but the very dry season stressed most of the plant species this year. Walking through the blackened landscape right afterwards, it seemed like about a fourth of the many anthills had survived, but seemingly dead colonies might have survivors we didn't see. On the other hand, survivors may have failed to hang on because their food supply was temporarily gone.

Field Guide to Plants

Although he is now living in Texas, Nick Lamkey has continued to work as editor of Spirit Mound Trust's webpage. Check out the new Field Guide to Plants he has posted. You will enjoy beautiful photographs of seven prairie grasses and eight forbs that grow on the Mound at various times, from spring through fall. Russ Stone, Brian Hazlett, Dianne Blankenship and Mark Wetmore contributed photos and information for the Field Guide. <https://www.spiritmound.org/?page-id=1233>



Prairie Fires: A Suggestion for Reading

By Molly Rozum

The fire that swept over Spirit Mound last April made me think of one of my favorite histories of the Great Plains, *Prairie Fire* by Julie Courtwright. She grew up in the Flint Hills of Kansas, which has the world's largest tallgrass prairie remnant, and is Associate Professor of History at Iowa State University. I assign her study regularly in my graduate Great Plains history seminar, always to the great satisfaction of my students. This study won awards from the State Library of Kansas and Denver Public Library. Courtwright's prose is lively and engaging, full of powerful stories about prairie fires. The book is sweeping in chronological coverage, from the period when Indigenous peoples broadcast fire to encourage new grass growth to attract game through the advent of settler society's systemic efforts to suppress fires to make their vision of fenced fields and towns a reality, up to the use of controlled fires in recent years to maintain healthy grassland ecology. Courtwright argues that prairie fires, whether present or absent, helped bind people who live within the region to one another and the place. *Prairie Fire: A Great Plains History* can be purchased at www.kansaspress.ku.edu or through any bookseller. A paperback edition is expected to be released in January 2023. Courtwright and her publisher, the University Press of Kansas, have generously agreed to let the Spirit Mound Trust reprint the following excerpt from Chapter 7, "Awfully Grand." Enjoy!

As a raging prairie fire bore down on a farm or a town, sometimes moving faster than a horse could run (or, by the early twentieth century, faster than an auto could drive), thoughts of aesthetics were few.²³ Still, some observers recognized the remarkable quality of the sight in spite of their terror. Merton Field, on his father's farm in Dakota, recalled a single moment amid hours of grueling battle against a prairie fire: "Pausing in our work to turn around we saw the upper strata of the smoke column borne like a celestial canopy in our direction, its under surface seething in deep red as the smoke billowed and rolled. . . . We stood awed at the spectacle. . . . But this was no time for gazing. Our task was yet unfinished."²⁴

As with Field's "deep red" smoke column, color was a significant element of prairie fire aesthetics. Jim Metzger described the contrast of colors within a slow-moving fire in Nebraska. The advancing flames, he noted, "looked like a red fringe to a large, black rug that was being unrolled" over the muted green and brown tones of the grass.²⁵ . . .

As a child in Nebraska, Minnie Calhoun was astonished not by the color of the burning fire but by the absence of color when the fire was suddenly extinguished. Calhoun witnessed a well-placed backfire directly encounter a headfire. "It was an awesome sight to behold the two fires come together and light the sky in one great blast of fire," she remembered years

later. "In the next few minutes there was absolute darkness. Not even the spark of a burning weed could be seen from our house and yard. We had all been watching . . . in awe at the spectacle. . . . We watched a while longer, but the fire was dead."²⁸

Transfixed by speed, light, color, or just overall grandeur, prairie fire observers were occasionally almost paralyzed by the lure of the flames—not only from fear but from sheer astonishment at the sight. An 1860 correspondent for the London Times concluded his romantic view of fire on the "Grand Prairie" by noting the siren call of the flames. "Hour after hour you will stand, fascinated with the terrible beauties of the scene," he wrote, "as the mass of red, sultry ruins grows and grows each minute, till your eyes are pained and heated with its angry glare and you almost dread the grand, fierce sheet of fire, which has swept all trace of vegetation from the surface of the prairie."²⁹ This was what witnesses meant by "awful splendor." . . .

Even if no lives were lost, a fire, at minimum, left behind a much-changed prairie. The land was blackened, an effect that many found unsettling and melancholy, especially after expending so much energy and emotion fighting the fire that had caused the "wasteland." Thomas Christy, on his trip across Nebraska, noted how "discouraging" the burned-over ground looked,³² and Alan Cheales, on a hunting trip in the Cherokee Strip, walked for many miles before he found anything that was not burned. "Nothing to be seen but burnt prairie ashes blowing in one's eyes," Cheales complained.³³

More hopeful and beautiful sights, however, also emerged out of the blackened prairie. Merton Field saw the areas of "dense black" land as a refreshing change from the "drabness" of the dead, dried grass that covered the remainder of his view.³⁴ In the spring the burned-over land promised new growth. "Mother Earth, in our neighborhood, has donned a garment of mourning," the editor of a Junction City, Kansas, newspaper observed after a prairie fire. "Blackness covers the face of the earth as far as the eye can reach. But in a few weeks it will be replaced by the lovely garb of vegetation peculiar alone to our beautiful prairies."³⁵

The editor's comment is revealing. Prairie fires and the landscape they helped create were part of an emerging identity among Euro-American Plains residents. Fire, although destructive and frightening, created something unique, or peculiar—"our beautiful prairies"—a place that Easterners could not understand and that inspired awe, even as settlers did their best to change it.

Prairie Fire: A Great Plains History by Julie Courtwright, published by the University Press of Kansas, © 2011. www.kansaspress.ku.edu. Used by permission of publisher.

NOTES:

24. "By Many Trails," unpublished autobiography, Merton Field Papers, MSS 28, Box 1, Folder 6, North Dakota Institute for Regional Studies, NDSU, Fargo, N.D, 74.

25. Jim Metzger, "Metzger Memories," unpublished manuscript, Metzger Manuscript Collection No. 128, Box 1, Folder 1, University of Nebraska Special Collections, Lincoln, Nebr., 7.

28. Minnie Calhoun Splinter, "Calhoun Chronicles," unpublished manuscript, Manuscript Collection No. 37, Box 1, Nebraska State Historical Society, Lincoln, Nebr., 188.

29. Reprinted in *Louisville Daily Journal* (Ky.), November 14, 1860.

32. George Hampton Crossman to T.J. Walker, New York, October 9, 1894, George Hampton Crossman Papers, Collection No. 20189, Microfilm 21000, Roll 4, North Dakota State Historical Society, Bismarck, N.D.; Robert H. Becker, ed., *Thomas Christy's Road Across the Plains* (Denver, Colo.: Old West Publishing Company, 1969), May 5, 1850 entry.

33. Division of Manuscripts Collection, Box 10, Folder 15, October 11 (year unknown), University of Oklahoma, Western History Collection, Norman, Okla.

34. "By Many Trails," Box 1, Folder 4, 11.

35. *Smoky Hill and Republican Union* (Junction City, Kans.), March 27, 1862

Farewell to Dianne Blankenship

Thank you, Dianne Blankenship, for your many years of service on our board of directors. We greatly benefitted from your knowledge of native plants found on Spirit Mound. We will miss you at board meetings, but hope to see you outside, exploring. Happy Trails!

Mound Membership

Spirit Mound Trust membership is \$10 per year. Additional donations, as well as the purchase of Bird Pins and the Ron Backer prints are welcome. All donations are tax deductible.

Your support helps to develop a better, more diverse historic prairie and fund other programs to make the Mound a more interesting place to visit.

Thank you for your support.

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Spirit Mound Pins

Spirit Mound Trust collector pins available.
Start your collection today.

The Bird Series

The first pin in 2016 was the *Bobolink*. A limited number are still available.



The second pin was the *Northern Harrier* in 2017.



Followed the third and final bird pin in 2018 the *Upland Sandpiper*.



The Butterfly Series

This series of pins showcase the beauty of the butterfly that inhabit the area around the Mound.

The first pin in the series is the 2019 *Monarch*.



The second pin added in 2020 to the series is the *Black Swallowtail*.



Added in 2021 to complete the series is the *Regal Fritillary*.



Ron Backer 24.5 x 22 prints are still available

To order the pins or print, use the form on the back of this newsletter. Email: info@spiritmound.org to make arrangements for local pickup and avoid shipping costs.

Spirit Mound Trust Supports Grassland Research

By David Swanson

The Spirit Mound Trust (SMT) supported two \$1,500 research grants during the 2022 field season for grassland research relevant to management of the reconstructed tallgrass prairie at Spirit Mound. Brief progress reports on the two projects that SMT supported are described below.

**Principal Investigator (PI): Mary Linabury, Ph.D.
Candidate, Colorado State University
Title: Pulse-pess dynamics: the potential for
threshold responses under global change
drivers in grasslands**

The goal of this research is to understand how tallgrass (Kansas) and shortgrass (Colorado) prairie plant communities respond to interactive effects of chronic nitrogen fertilization (resulting from human activities) and intense short-term precipitation events that are predicted to increase under most climate change scenarios. The project involves experimental manipulation of long-term nitrogen levels along with simulated extreme rainfall treatments to monitor changes in plant species composition and biomass in shortgrass and tallgrass prairie treatment plots in Colorado and Kansas. This past field season, supported by funding from SMT, the PI and several undergraduate field technicians collected plant species composition and biomass data from experimental plots at both locations. Preliminary data suggest a strong influence of nitrogen on tallgrass prairie plant communities and a lesser impact of intense rainfall events on plant production.

**Principal Investigator: Lydia Westerberg, M.S.
Student, University of North Dakota
Title: Plant composition and turnover across
Midwestern and Pacific Northwest grasslands**

The goal of this research is to compare soils and plant composition among crop fields, natural grasslands and federal Conservation Reserve Program (CRP) fields to determine the effects of CRP on regional plant communities and soil characteristics. Paired crop, CRP and natural study sites extended across 12 states in the Corn Belt, southern Great Plains, northern Great Plains and Pacific Northwest regions of the United States, with 440 total study sites. This past summer, the PI and several student field technicians collected soil core samples and plant species composition and biomass data from all 440 study sites, including Spirit Mound. Analyses to be conducted over the next several months include comparisons of plant species similarity, plant species richness, plant productivity, and soil characteristics among cropland, CRP and natural grassland sites. The PI plans to present preliminary data from this project at the North Dakota Wildlife Society conference in Mandan, North Dakota, in February 2023.

The SMT plans to support another round of the Grassland Research Grant Program for the 2023 field season. Grant proposal applications must include a title for the project, a description of the objectives, significance of and methods used in the research, a budget (up to \$1,500) and budget justification, plans for dissemination of the research results, and two letters of recommendation. The deadline for submission of grant proposal applications for the 2023 field season will be 1 February 2023, with notification by 15 March 2023. The applications must be submitted by email to the SMT Grassland Research Grant Program at info@spiritmound.org.

A Few More Fire Photos



A Look Forward in Spirit Mound Management

By Jason Baumann, District Park Supervisor

As we just finished out another growing season in the area it's time to look forward to another year at Spirit Mound Historic Prairie. Who could have predicted the year we are about to complete with the wild fire in the spring, persistent drought all summer and fall and the slow re-growth of the old feedlot? As we could have never predicted those things we just have to adjust our management and move forward. So, as we look forward to next year and as we lay our plans, we will adjust to the unforeseen and hope for the best.

One item that we were all hoping would be completed in the summer of 2022 was the insurance claim that was filed regarding damage the park sustained this last spring from the fire. Most notable was the damage to the shed where we stored our tractor and tools. A reminder was recently sent to the insurance agency about the progress of the claim. With some luck we will be able to start the season off with a repaired shed and be back to normal on the maintenance side of Mound management.

This year's burn is a good reminder that fire can be a great tool for grass management. While the spring fire was in some places very destructive, there were some benefits to the large area of grass that burned. The prairie quickly recovered, and the new grass will help rejuvenate the burn areas for several years to come. Parts of the Mound do still need to be burned for the same rejuvenation benefits, but we have not been able to burn for the last several years. Notably what has been holding us back is the persistent drought. This was the last year of our 5-year burn plan, and if we want to continue to burn in the area, park staff will have to update and resubmit the plan for approval. Hopefully in the next few years, all areas of the Mound will be burned to give that disturbance the grass needs and to control invasive plants.

We have an ongoing struggle with the old feedlot. The two main obstacles we are facing are soil chemistry and weed control. It's been a difficult area, but we will not give up. I think we are going to move into a replanting phase this summer to prepare the site for a late fall planting of a basic native grass mix.

In the upcoming season we want to accomplish some trail work. The bridge needs some attention, trails need to be dressed with crushed aggregate, and the steps leading to the top of the mound need some work.

When the growing season gets started, it's a busy time with mowing weeds, controlling thistles, placing signs, removing trash, cleaning the restroom etc. For the last few years Bill Ranney has been a part-time seasonal worker. Bill has done a great job but we are also looking for a second part-time worker to help with some of these duties as they are too much for one person. I will plan to do some local advertising to see how much interest there is.

Only time will tell how we progress with our plan. One thing is for certain, we have no idea how the year will

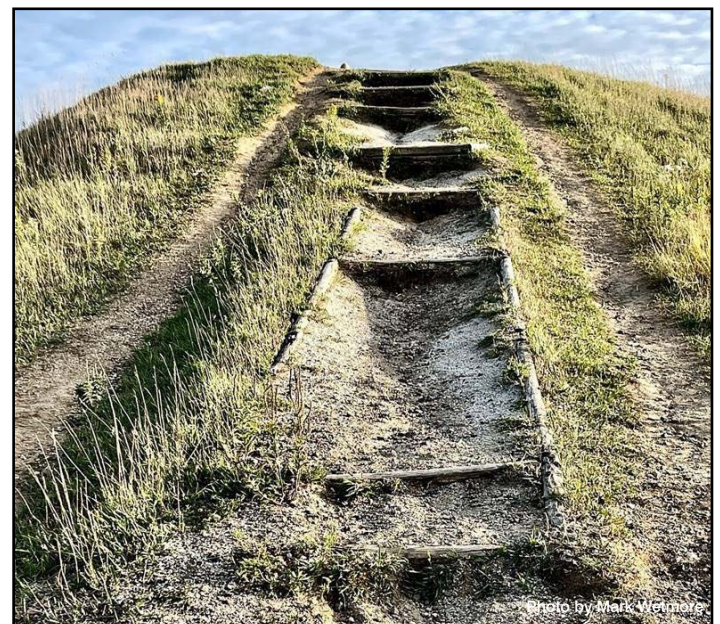
progress, but we will work with the changes that may arise and do the best we can for Spirit Mound.



Blackened area burned



View of Mound in late October 2022.



View of steps leading to the top of Spirit Mound.

Spirit Mound Trust

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Mound photo by Paulette Mehner-Wijff

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Please add my name to the 2023 membership roll of the **Lewis and Clark Spirit Mound Trust**. I enclosed my check for \$10 (tax deductible*). Members will receive our newsletter.

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*Thank
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