

Spirit Mound Trust News

P. O. Box 603 | Vermillion, SD 57069 | info@spiritmound.org | www.spiritmound.org | December 2018

Our Beautiful Prairie

By *Meghann Jarchow*

I am deeply grateful to be serving as the third president of Spirit Mound Trust, which was founded 32 years ago. Spirit Mound Trust's first president was Larry Monfore, who had the vision and perseverance to see Spirit Mound returned to prairie. Following Larry's death in 2003, Jim Heisinger became the president of Spirit Mound Trust. Jim led the Trust for fifteen years with great expertise and passion for our special place. Under Jim's leadership, Spirit Mound has transitioned from the early stages of becoming a prairie restoration area and state park to being a travel destination that has been visited by tens of thousands of people from this region and around the world. I am honored to have the opportunity to follow those first two leaders as president.



The prairie at Spirit Mound continues to thrive although there are also multiple areas where additional restoration is needed and has been occurring. For example, the creek and former feedlot area were the targets of this year's restoration efforts. The (mostly non-native) vegetation surrounding the creek was not killed with herbicide when Spirit Mound prairie was initially restored, and that established vegetation has remained dominant. Two areas near the creek where efforts to restore prairie plants were made are Monarch Meadows and the Children's Prairie. Monarch Meadows is a 10-acre area along the creek that was hayed then sprayed with herbicide in 2015, and was seeded with a high-diversity (46 species) seed mix in 2016. The Children's Prairie is a 2-acre area just east of the trail that was sprayed with herbicide and subsequently seeded by the fourth grade students from Jolley Elementary School in September 2016. These areas have been mowed to encourage the establishment of prairie plants and are being monitored. The former feedlot area is in its third, and hopefully final, round of post-prairie seeding man-

agement (the former feedlot was previously seeded in 2002 and 2007). In the fall of 2017, this 25-acre section east of the mound was seeded with a grass-heavy seed mix. The area was mowed twice this year and will be mowed again in

2019. As with most prairie restoration work, we feel a mix of anticipation and apprehension as we wait to see how well the prairie plants will establish in these areas.

In addition to the active restoration work, there were management activities this year throughout Spirit Mound. Most of the northern half of the Mound was burned last spring, and as a result of the ample precipitation, the prairie plants responded to the burn with vigorous growth. The prairie remnant on the west side of the mound was mowed in June to set back the smooth brome, and tree removal remains a never-ending management activity within this prairie. A shelter with picnic tables was installed to the south of the parking lot, so now there is a shaded area where visitors can sit and view the Mound and rest before or after hiking on the trail. We are fortunate that SD Game, Fish and Parks Department is guiding the management of Spirit Mound, and are grateful for Clarence Pederson's day-to-day caretaking of the prairie. Late in the growing season this year, Clarence experienced a sudden viral infection that caused a brain injury. We think about Clarence often and hope that he will soon be able to enjoy the sights and sounds of Spirit Mound again.

Spirit Mound Trust has had other changes this year. We mourn the loss of Jim Peterson, a long-time member of the Board of Directors. We welcome Nick Lamkey, geologist with the SD Geological Survey, who was elected secretary of our Board of Directors at our fall Board meeting.

In my new role as president, I would like to hear from all of you who care about Spirit Mound. Please reach out to me (Meghann.Jarchow@usd.edu or 605-677-6122) if you have suggestions about how Spirit Mound Trust can help to make Spirit Mound even better.



Meghann Jarchow and family enjoying the view – and wind from the top of the Mound

Honoring Jim Heisinger

By Norma Wilson

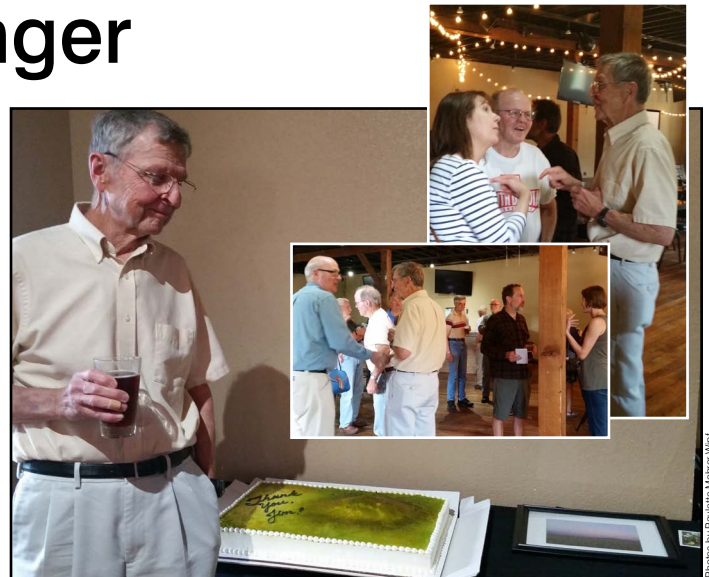
When she found out Jim Heisinger and his wife Barb would be moving to Cedar Falls, Iowa, our new President Meghann Jarchow, who chairs USD's Department of Sustainability and Environment, planned a going-away party so that Jim's friends and associates in the Vermillion community could have an opportunity to celebrate his work with Spirit Mound Trust and the Living River Sierra Club Group. The celebration took place on June 28 at the Old Lumber Company in Vermillion. There we enjoyed a unique cake in the shape of Spirit Mound. Afterwards some of the many people who worked closely with Jim over the years spoke about his love of the environment and his work to preserve it.

In her introductory remarks, Dr. Jarchow presented a biographical sketch. As a child Jim Heisinger explored the limestone bluffs, clear streams and forest of central and southern Missouri, delighting in the discovery of the fauna and flora. Heisinger earned a Ph.D. in zoology from the University of Missouri at Columbia in 1965. Dr. Heisinger's first faculty position was at the University of Missouri at Saint Louis. Tiring of big city life, he came to USD in 1968. Gradually his research shifted from physiological and biochemical environmental adaptations to the effects of toxic substances on embryonic development and animal health. In 1979 he spent a year as Visiting Professor of Toxicology and Pharmacology at the Medical College of Wisconsin. Returning to USD, he eventually served as Associate Dean of Arts and Sciences for a decade and as Chair of the Biology Department for three years.

Retiring in 1999 Jim began to engage in non-academic passions: kayaking, bicycling and running; cycling numerous states and the Lewis and Clark trail; and running many road races and one marathon. His career and life long interests in nature, and environmental conservation led him to an active involvement in the Sierra Club. In 2001 he became the Chair of the Living River Group and continued in the position for 14 years. He soon found himself with a second position, Sierra Club South Dakota Chapter Chair. He served as President of the Spirit Mound Trust from 2002 until 2018. The attempt to restore that historic prairie kept him busy and happy, and he enjoyed and deeply appreciated his associates. He also served on the boards of both Greening Vermillion and the Friends of the Missouri National Recreational River.

Mark Wetmore, a long-serving member of the Spirit Mound Trust Board, said, "Jim was so much fun to work with over the years, as he shared his insuppressible wonder, joy, curiosity, and excitement about all the small and large things we experienced at the Mound." He added, "We all love you Jim. Godspeed to your new adventures."

Clarence Pederson shared recent experiences with Jim at both at Spirit Mound and in helping Jim to find new uses for the items he couldn't take along with him and to pack what he needed before moving. Clarence said he enjoyed being with Jim who was always eager to share his extensive knowledge of the flora and fauna in our area.



Jim with his Spirit Mound cake and reminiscing with friends.

Jerry Wilson spoke of Jim's actions during the past 20 years to protect the Missouri River ecosystem and promote it as an environmental resource, including the jet ski ban; the Missouri River Trail and its interpretive signage, which our late friend Nancy Carlsen had a big hand in; and his work in the battle against Hyperion.

From Jim, Jerry learned that most of what he thought he knew couldn't be described as theory, but only as hypothesis. So Jerry hypothesized that Jim's good work would carry on, not only in South Dakota, but would also advance to Iowa. And in fact, Jim is already collaborating with new friends in Cedar Falls to plant native prairie near his new home.

John Davidson's tribute was a call to action, "No matter how contentious the issues in which [Jim] was involved, he maintained a civility and good humor which appealed to the better angels of our nature." [With apologies to President Lincoln.]

"Honoring Jim will mean little if we do not re-commit to build on his work. Right here in the Northern Plains more than 2 1/2 million acres of native grasslands have been plowed since 2015. Songbirds which rely on the northern prairies have declined by 65% to 95% since they were first counted in the 1960s. We are surrounded by polluted rivers. There is work to be done, and it can be accomplished only by active citizens."

As the Spirit Mound Trust continues the work of preserving and restoring the environment surrounding this important landmark, we continue to be inspired by Jim's example. At our meeting on October 30, our Board of Directors voted to grant Jim Heisinger Emeritus status. Jim may not be living here, but he is certainly not forgotten. Yet though we will miss him, we can also feel hopeful that the many naturalists and scholars who remain on our Board and in our university community will continue their research and interest in Spirit Mound. We gain new knowledge of the flora, fauna, history, atmosphere and cultural significance of Spirit Mound from scholars and naturalists like David Swanson and his student Amy West, who share their research in this newsletter.

A Fond Farewell

By Jim Heisinger

After living for half a century in Vermillion it became my sense of place. However, family considerations induced me to move to Iowa, leaving behind both my social and geographic senses of place, cherished friends, Spirit Mound and the rivers of Clay County. Members of the Spirit Mound Trust organized a “going away party.” Fortunately for me the event was a “celebration of life without a corpse.”

I thank the organizers and all who attended. It was indeed an honor to be standing among so many who value natural environments. It has been a great adventure and privilege to be the President of the Spirit Mound Trust for the past 17 years, working to fulfill the dream of my deceased friend and former student Larry Monfore. His dream, shared by generations of board members, was to purchase this historic site, reconstruct a facsimile of the lost prairie of Lewis and Clark and open it to the public for their education and enjoyment.

He lived to see the purchase of the land and the birth of this historic state park. Converting the degraded landscape into a highly diversified prairie is a multi-generational task. However, during this prairie birthing thousands have enjoyed the grandeur of the floral display, colorful insect and bird populations. They were also reminded of the ancient sea that covered the Midwest, the glacial sculpting of the land, the courage of the early explorers, the insights of President Jefferson, the mistreatment of native Americans, and the loss of the great prairie ecosystems. The restored prairie will serve continue to remind future generations of an historic national adventure while enjoying the beauty of a diversified prairie.

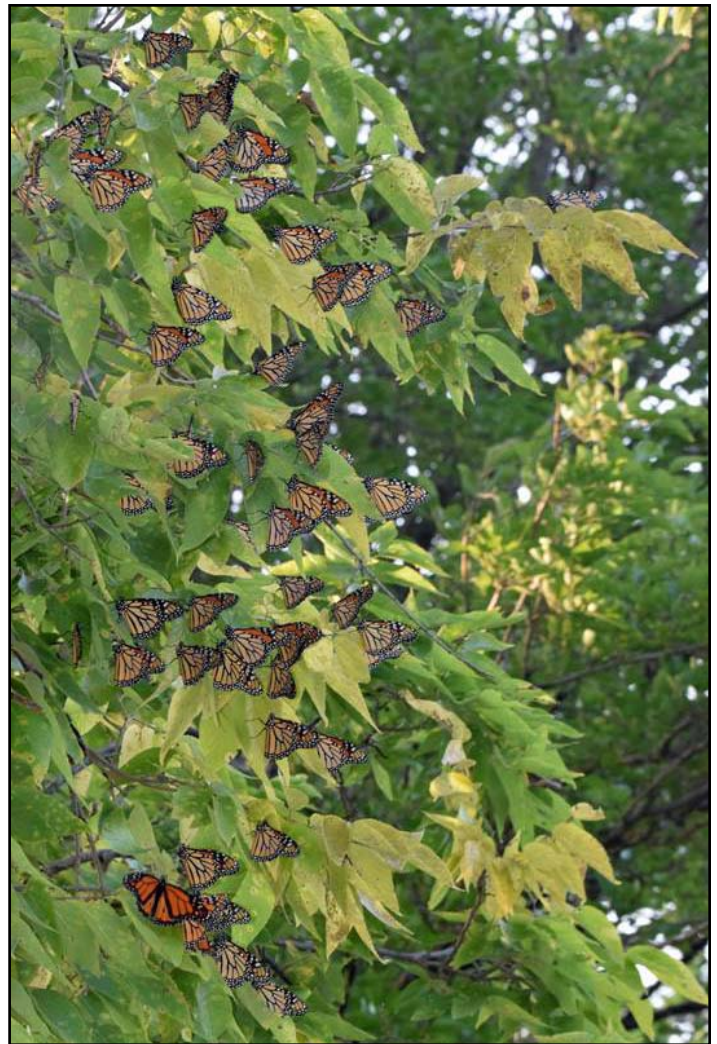
I have been surrounded by a board of hard working like-minded friends, and our efforts have been supported by generous trust members. I wish I could personally thank each and every one of you.

The future of Spirit Mound appears secure. The new president, Meghann Jarchow, is a prairie scholar, with a background in a wide variety of environmental issues, in education and community outreach. The Trust has always worked well with the dedicated states employees who do the day-to-day work that makes our tiny park special. As the years go by I can only hope that newsletter readers will follow the advice of the Sierra Club and enjoy, explore and protect Spirit Mound.



Monarch Catepillar

Photos by Mark Wetmore



There were more monarchs across the upper Midwest this year than there have been for a long time. This migrating roost was at the mound in August.



Monarch on Butterfly Weed

Migration Stopover Biology of Prairie Birds at Spirit Mound

By Amy West and David Swanson

Every year in continental climates like South Dakota, food resources become limited as the cold weather sets in during winter. As food availability declines, most birds respond by flying south for the winter to warmer climates with greater food resources. During spring the abundance of resources returns, and so do the birds.

While migration is essential to the life of migrant birds, it takes a lot of energy. During migration, birds prefer high-energy foods. Before migrating, birds will eat lots of this high-energy food to build up fat stores, which serve as fuel for the migratory flights. However, most birds cannot store sufficient fat to make the journey without stopping along the way, so migrants rebuild fat stores at sites along the migratory route. These stopover sites are essential to bird survival and to the successful completion of their migration. Not all places that birds land along the migration route contain sufficient food resources. If stopover habitats are not providing sufficient food, this slows down migration and can prevent birds from breeding or reduce their reproductive success, which can lead to population declines.

Grassland birds, as a group, are showing the greatest population decline of any bird group. Loss of habitat for breeding and migration is thought to be a primary factor involved in these population declines. In the Midwestern United States, grassland habitats have been reduced and fragmented, potentially leaving migratory grassland birds with limited options for migration stopover. In addition, while birds may be using grassland fragments as stopover habitat, this does not ensure that these habitats are providing the resources necessary for birds to rebuild fat stores. Through our research, we want to determine which birds are using prairies for stopover habitat and whether these birds are finding enough resources on the prairie to rebuild fat stores to continue migration.

For two field seasons (Spring and Fall 2018), we have been capturing birds in mist nets during migration at Spirit Mound Historic Prairie. Once we capture the birds, we take a small blood sample. We then use these blood samples to measure levels of the blood plasma metabolites: triglyceride and beta-hydroxybutyrate. Triglycerides form in the blood after birds have eaten food and transformed it to fat during the process of fat deposition. In contrast, beta-hydroxybutyrate forms when fat is broken down as fuel for activity. High plasma triglyceride levels mean that birds are fattening effectively, suggesting that a stopover habitat is of high quality. By contrast, high plasma beta-hydroxybutyrate levels indicate that birds are not successfully adding fat and that the stopover habitat is of low quality. After taking blood samples from birds, we also band the birds and weigh them, so that we can determine whether or not the birds have gained weight if we capture them later on.

Swamp Sparrow



Nashville Warbler



LeConte's Sparrow



Preliminary results suggest that numerous grassland bird species occur at Spirit Mound Historic Prairie during migration. Birds are using prairies for stopover more frequently in the fall than in the spring. Grassland, woodland/shrub, and habitat generalist bird species are all present at Spirit Mound during the migration seasons. The majority of the birds that we recaptured at least one day after their original capture were gaining weight, which suggests that birds are finding the resources that they need at Spirit Mound.

We plan to continue our research for two more field seasons (Spring and Fall 2019) to help confirm these preliminary conclusions. Studies of stopover biology for grassland birds, such as this one, are very few, but are needed to determine which features of grassland habitats facilitate successful stopover and migration. Such studies will help us to identify high quality stopover habitat, which will help inform recommendations to improve and create restored prairie habitats throughout grassland bird migratory pathways

Northern Harriers at Spirit Mound

By David Swanson

The sight of a Northern Harrier buoyantly kiting low over the prairie is an iconic Spirit Mound birding experience. Northern Harriers belong to a group of raptors known as the Harriers, which are closely related to the accipiters, a group including Sharp-shinned and Cooper's hawks along with Northern Goshawks. The Harriers have a worldwide (except Antarctica) distribution and uniformly occupy open habitats. The Northern Harrier is the only member of this group in North America and can be found across the continent in open habitats, including grasslands and marshes. The association with marshes was the basis for its former name, Marsh Hawk. Harriers in general, and Northern Harriers in particular, are characterized by slender builds with long wings and tail, and they forage by flying low over open habitats to ambush prey. Their diet consists primarily of rodents and small birds, but may also include reptiles and frogs.

The Northern Harrier is a migratory species, with the southern boundary of the breeding range extending from northeastern California, southeast to the Texas panhandle, then northeast to central Iowa and southern regions of the Great Lakes states, and east to Pennsylvania and New Jersey. The northern boundary of their breeding range extends from Alaska to eastern Canada, primarily south of the Tundra. Their winter range includes southern portions of their breeding range, including southern South Dakota, south to Central America. In South Dakota, the species can be found across the state, but is rarest in the southeast, where the percentage of grasslands on the landscape is lowest. I find that the Northern Harrier is most common at Spirit Mound during the fall migration period of September through November, where it is a relatively common sight hunting low over the prairie.

The species is sexually dimorphic, meaning that males and females have different plumage patterns. Females are generally brown overall, solid on the upperparts and streaked underneath. Males are gray and white, with gray upperparts and white underparts, including the wings, which also have prominent black wing tips. Both sexes have prominent white rumps, and this is a helpful identification feature. Another interesting feature of their appearance is that both sexes have owl-like facial disks, which help to concentrate sounds to their ears and assist them in locating prey by sound as well as by sight. A behavioral feature helping to identify this species is that they tend to soar, both at low and higher altitudes, with their wings held in a shallow V-shape, called a dihedral. Many other hawks soar on flat wings, although Turkey Vultures also soar with their wings in a dihedral.

Northern Harriers nest on the ground in grasslands and wetlands, building their nests in patches of taller vegetation for cover. The nest is an open cup with a base of coarse plants or sticks and a cup of finer grasses and sedges. The female generally lays 3-6 eggs, and the pair raises only a single brood per year. The eggs are incubated for 30-32 days, and



the young first fly about 4-5 weeks after hatching, so the nesting period lasts for 60-70 days. The nesting period in South Dakota typically occurs from late April through June. The female incubates the eggs alone, but the male provides

almost all of the food for her during incubation. Throughout the courtship and nesting period, the pairs may engage in aerial prey transfer where the males drop captured prey to the female in flight. This interesting behavior is thought to be involved in the establishment and maintenance of pair bonds.

The loss of grasslands and wetlands over the past century in the Central Plains States has created a conservation hurdle for this species. Breeding Bird Survey data suggest that populations of the Northern Harrier in the Central United States and across its range in North America have been declining at a little over 1% per year since the 1960s. The population, however, appears generally stable in South Dakota. Thus, the sight of a hunting Northern Harrier skirting just over the tops of the big bluestem will hopefully continue to be a regular occurrence at Spirit Mound into the future.

Bird Pin Series

The limited edition pins intended to honor migrating birds returning to the restored prairie habitat are still available.

In 2018 the Upland Sandpiper was added to the collection, which also includes the Northern Harrier honored in 2017 and the Bobolink honored in 2016.



The 1" by 2" enamel pins cost \$10 each, plus \$4 shipping for one, or \$5 shipping for two or more pins.

To order the pins, you may use the form on the back of this newsletter, or the pin(s) may be purchased and/or picked up at Pressing Matters, 102 East Main Street, in downtown Vermillion. If you email to info@spiritmound.org, we can arrange pickup or delivery.

Spirit Mound Cemetery Board Award

The Clay County Historic Preservation Commission presented a Certificate of Recognition to the Spirit Mound Cemetery Board at Vermillion Rotary Club on November 7th. Mark Wetmore accepted the award on behalf of the Board and spoke to the meeting about the work that has been done. His presentation, enhanced with slides, was entitled "Recovery of the Spirit Mound Cemetery." Mark spoke about the history of the cemetery, beginning with the first burial in 1875. He said the cemetery was in active use for 50 years, but as pioneer families died or moved away, it became neglected.

In 2012, the Clay County Commission established the Spirit Mound Cemetery Board of Directors at the request of Mark Wetmore, Nancy Carlsen and Cindy Kirkeby, and these three were appointed to serve on the Board. Through their oversight and work, alongside other volunteers, burial stones have been righted and anchored, the grass has been mown, trees on the site have been trimmed and nurtured, an interpretive sign has been placed at the gate, and the surrounding tallgrass prairie remnant renewed. Nancy Carlsen wrote a history of the Cemetery which was published in our 2012 newsletter. After her death, Cindy Kirkeby and Mark Wetmore installed a bench there in her memory.



Photos by Mark Wetmore

Summer Time Wildlife at the Mound

Photos by Mark Wetmore



Spirit Mound Trust Board of Directors

Meghann Jarchow, President
 Tim Cowman, Vice President and Web Editor
 Nick Lamkey, Secretary
 Mark Wetmore, Treasurer
 Norma Wilson, Newsletter Editor
 Paulette Wipf, Newsletter Format Editor
 Molly Rozum, Diane Blankenship, and Brian Hazlett.

The Night Sky at Spirit Mound

By Nick Lamkey

As an astronomy enthusiast, Perseid's meteor shower was on my radar. I was geared up to watch it on August 11th during its peak, so it was a delight to find out that there was a night sky program offered at Spirit Mound that evening. When I arrived there, I was pleasantly surprised to see the parking lot completely full. Thanks to volunteer, Clarence Pederson, parking was a breeze.

We gathered around the host, Dan Peterson, who is the Chief of Interpretation, Education and Outreach for the Missouri National Recreational River from the National Park Service. He introduced the crowd of about 90 people to Clarence and Sandy Pederson and to USD chemistry professor, James Hoefelmeyer, who had just finished setting up their telescopes and field binoculars on the trail to Spirit Mound. We would be looking at Mars, Jupiter, Saturn and Venus while we watched for meteors.

Professor Hoefelmeyer informed us that the way Jupiter, Mars, Saturn and Venus were aligned that night revealed how Earth was oriented on the plane of our solar system. As he pointed this out with his green laser, tracing the planets with a slight arc across the sky, I realized I had never before looked at the sky from this perspective. It made the planets all the more interesting to gaze upon.

Hoefelmeyer, the Pedersons and Dan Peterson walked us to the telescopes and began telling us about constellations and planets as we viewed them through each one. The first telescope was trained on Jupiter, which is always a treat to look at. Three of Jupiter's moons circled the planet's gaseous orange, red and yellow layers. The next telescope was pointed at Saturn, arguably the most exciting planet to look at through a telescope because of its striking rings and colored layers. That night was no exception. The third station held a pair of field binoculars set up for viewing Mars. Just eleven days earlier the planet had made its closest approach to Earth since 2003, causing Mars to be a brighter red than usual that night.

After viewing the planets, I located the constellation Perseus from which the meteors would radiate. There were still no meteors, but we surmised that the recent wildfires in Canada and the Western United States were to blame. We would have to wait until later that evening for the meteor shower to be more visible at its zenith.

At about 11 p.m. we began seeing meteors. The small group of eager watchers cheered when three consecutive meteors streaked across the sky. Not being used to seeing them so vivid and bright, I stared in awe as each meteor entered the atmosphere in a blaze. They put the occasional shooting star to shame. Spirit Mound was the perfect place to watch the Perseids' meteor shower. I really appreciate the efforts of Dan Peterson, James Hoefelmeyer and Clarence and Sandy Pederson. They made what would've been an ordinary night special for everyone.

Remembering Jim Peterson



By Mark Wetmore

Jim Peterson, a member of the Spirit Mound Trust board for 20 years, passed away in June 2018 at the age of 92. Born and raised in Ponca, Nebraska, he served in the Army Air Force during WW II, and taught business law at USD for over 30 years. Jim loved the Missouri River, its beauty, drama, environment and history. As president of the Lewis and Clark Trail Heritage Foundation in the years leading up to the expedition's bicentennial, he approached a former student, South Dakota Governor Janklow, and thus helped start the state's effort to acquire the Mound.

Clarence is Back Home!!

By Jerry Wilson

Spirit Mound caretaker and friend Clarence Pederson endured eleven weeks of hospitalization to treat a severe virus, first in Sioux Falls, then in a rehabilitation facility in Omaha. But he is finally back home in Vermillion! Clarence, who also chairs the Living River Group of the Sierra Club, worked closely with former Spirit Mound Trust president Jim Heisinger, then with president Meghan Jarchow, to control invasive plants and enhance restoration of native prairie. But equally important, Clarence has been an unofficial ambassador for Spirit Mound to visitors from around the nation and the world, welcoming hikers and educating them about the Mound's history and biodiversity. Clarence's friends can't wait to resume rambles with Clarence, including up Spirit Mound!



Clarence Pederson at Spirit Mound.

Spirit Mound Trust

P.O. Box 603
Vermillion, SD 57069

ADDRESS SERVICE REQUESTED

On August 25, 1804, William Clark wrote in his journal—

“from the top of the Mound we beheld a most butifull landscape; Numerous herds of buffalow were Seen feeding in various directions; the Plain to North N.W. & N.E. extends without interruption as far as Can be seen.”

Today, more than two hundred years later, Spirit Mound remains a natural wonder.

Spirit Mound Historic Prairie Membership Renewal and Order Form

Spirit Mound Trust membership is \$10 per year. Additional donations are welcome, and all 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. If you live in the Vermillion area and want to avoid shipping charges on the pins, send an email to: info@spiritmound.org to make arrangements. Please join us:*

Please add my name to the 2019 membership roll of the **Lewis and Clark Spirit Mound Trust**. I enclosed my check for \$10 (tax deductible*). Members will receive our newsletter.

Additional contributions are welcome.

Name _____

Address _____

City _____

State _____ Zip _____

Phone/email (Optional) _____

*Tax exempt 501 (c) (3) organization (No 93-0921345)

Please send me the following:

| | |
|--|----------|
| ___ Ron Backer print \$100 ea | \$ _____ |
| ___ 2016 Bobolink Pin \$10 ea | \$ _____ |
| ___ 2017 Harrier Pin \$10 ea | \$ _____ |
| ___ 2018 Sandpiper Pin \$10 ea | \$ _____ |
| + \$4 shipping for 1 pin / \$5 for 2 or 3 pins | |
| Shipping on pins | \$ _____ |
| Membership \$10 form on the left | \$ _____ |
| Total Amount Enclosed | \$ _____ |

REMIT TO:

SPIRIT MOUND TRUST

P. O. Box 603
Vermillion, SD 57069

*Thank
You!*