

Spirit Mound Trust News

P.O. Box 603, Vermillion, SD 57069 • info@spiritmound.org • www.spiritmound.org • Norma C. Wilson, Editor • December 2009

Wealth of Species

James F. Heisinger

Along the highway to Spirit Mound are fields of monocultures: soybeans and corn. Corn is the grass that replaced the species-rich prairie described by Lewis and Clark. Pulling into the parking lot at the historic prairie and glancing at the wealth of native grass and forb species, we sense the vulnerability of monocultures unattended by humans. The soybeans and corn have been replaced by a diverse, well-adapted flora and fauna. These native grasses have been adapting since the glaciers retreated 11,000 years ago.

Just south of the parking lot is a small grove of trees. To their east is a cornucopia of newly reclaimed prairie. In early summer of 2009 the transition between trees and prairie was abrupt and unnatural. Usually there is a transition zone between plant communities (ecotones). In prairies we usually see grasses blending into shrubs and bushes and finally trees. These transition zones are extremely species rich. This transition zone had been cleared long ago by farmers for monocultures.

The Spirit Mound Trust enlisted the assistance of an aspiring Eagle Scout, Andrew McCann, to re-establish some shrubs and small trees: wild plum, buffalo berry and choke cherry. All three were selected because they were plants used by the Sioux for food. They are common species of wooded and prairie ecosystems on the Great Plains, and they also happen to be plants described by Lewis and Clark. They are surrounded by fencing to protect them from deer and rabbits in winter.

Walking north on the trail and crossing the bridge, you



will see a short path to the right along the creek. Among the 80 species introduced or reintroduced to the Mound in 2009, many are inhabitants of wet areas and were seeded or planted along this trail spur. Trust members and the scout anxiously anticipate their emergence in the spring of 2010. We plan a bench

alongside the creek where you can sit and contemplate the diversity and beauty of this prairie.

As plant species increase, so do the numbers of prairie-adapted animal species. Rustling among the plants are numerous mammals, birds and insects specialized for life among the grasses, forbs and the reconstituted ecotone.

As you read the following articles you will experience how we have put your membership dollars to work promoting biodiversity. Plants and seeds were purchased; herbicides obtained (to use judiciously); signs posted to identify the plants and other inhabitants of restored prairie. It has been a busy year for Mound volunteers.

In addition to the volunteer efforts at the Mound, board member Tim Cowman has been doing a great job of managing and improving the web site at www.SpiritMound.org. The site contains historic and natural history information along with previous news letters. Please email comments and suggestions to us at info@spiritmound.org. If you have special Mound stories you would like to see published in our newsletter, please submit them to us. If you want to help as a volunteer, send us your email address and let us know the type of work you would like to do.

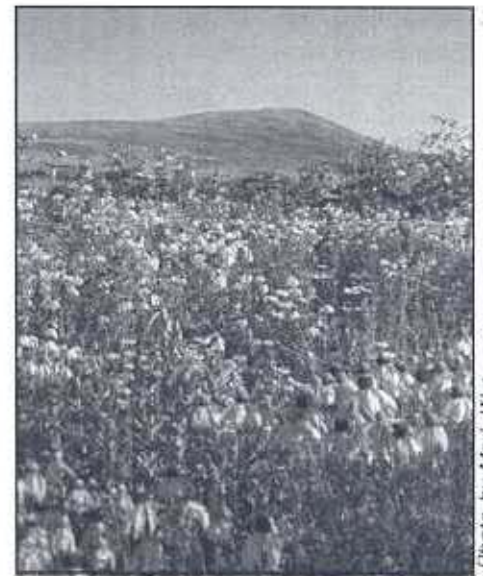


Photo by Mark Wetmore

Support the Mound

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. Our address is P.O. Box 603, Vermillion, SD 57069.

Progress Report on Restoring Diversity

Dairne Blankenship

For the 2008 newsletter I wrote about my enthusiasm for prairies and native plants. I enjoy visiting both the prairie remnant on the northwest side of the mound and the restored prairie on old corn and soybean fields. I expect this enjoyment to be enhanced as biodiversity is increased.

The focus on increasing the diversity of the plant species there, in turn, will increase the success of the prairie community, including the birds, insects and other wildlife. We can hope for a healthier and more sustainable ecosystem that will be closer to what Lewis and Clark experienced on their visit over two hundred years ago.

In 2009 we consulted the species list of plants that are historically native to Clay County and obtained seed to use in over-seeding. The aim was to utilize seed of plants from as nearby as possible, called *local ecotype seed*, and also seed from similar habitats. Seed was both collected and purchased. For two areas, plants were added.

Plants collected by Lewis and Clark or documented in their journals are called *Lewis and Clark plants*. While some already grow at the Mound, we are especially interested in re-establishing those that are missing. This year fifteen of these species of Lewis and Clark Plants have been obtained as either plants or seed: buffalo berry, clammyweed, curly-cup gumweed, cut-leaf ironweed, prairie wild rose, wild plum, aromatic aster, buffalo bean, choke cherry, death camas, Illinois bundleflower, plains coreopsis, prairie turnip, wild licorice and yucca.

The seed of dozens of additional species has also been collected or purchased. Species represented include plants that naturally would have grown at the Mound but now are either scarce or absent. This will further promote species richness at the Mound and increase the populations of some of the existing Lewis and Clark plants.

To create the best opportunity for success, the challenge is to target specific areas to be sown with appropriate seed, to prepare the areas to be sown, and to properly *time* the sowing. Special management might later be needed to help the seedlings survive. Don't be surprised if you see some mowed patches on your visits in 2010!

As plants become established (which can take years), additional signs will be made to introduce visitors to these plants. The website will also be updated with individual photos of many of these plants.

Do not expect to see sudden changes at the Mound, but over the next several years, you can expect to observe progress toward a more diverse prairie and an associated increase in butterflies and other species. Something to anticipate on your future visits!



Planting along the creek

Insects on Spirit Mound

Mark Wetmore

Bugs are the new birds. At least that's what some people are saying as insect observation, study and photography become more popular. With the macro setting on pocket digital cameras now, it's possible to photograph insects and use the photos at home to identify the species. Insect and spider photos can be posted to *bugguide.net*, a web site run by Iowa State University's entomology department where experts will add identifications. The cumulative data on location and dates on the site add to the overall knowledge of species.

These new tools seem to be putting popular insect study where the new *Peterson Field Guide to Birds* put birding in the 1930s. And it's true that more visi-



Chickweed Geometer Moth

tors to Spirit Mound each year come to see butterflies and insects. For instance, last June a high school-age young man and his father were on the mound looking for regal fritillary butterflies; other summer visitors told friends that they didn't make it to the top of the mound because they spent their time looking at insects along the trail. Jody Moats from the Adams Nature Center had over 40 people attend her monarch-tagging event at the mound this year.

You can visit the *bugguide.net* site now and search for "Spirit Mound" to see insects photographed there last summer. If you take an interesting insect photo on Spirit Mound and can post it to the site, please do so; and mention the mound in the location data.

Prairie Ants on Spirit Mound

Mark Wetmore

Ants were the first insects documented on Spirit Mound. On August 25, 1804, Lewis and Clark observed great numbers of birds attracted to swarms of flying ants at the summit.

Captain Clark wrote:

I discovered that they wer Cetechig a kind of flying ant which were in great numbers about the top of this hill, those insects lit on our hats & necks, Several of them bit me verry Sharp on the neck...

Although usually wingless, ant colonies can produce large numbers of winged individuals during breeding flights in the summer. This year colonies of two species of ants adapted to prairie habitat were found on prairie remnant areas of the mound.

In April, when there were still patches of snow on the ground, we discovered a large mound of the western thatching ant, *Formica obscuripes*, in the remnant area west of the summit. These red and black ants build their large dome-shaped mounds almost entirely of dried plant material, mostly short segments of grass, and they live on scavenged and hunted invertebrates and on the 'honeydew' they collect from aphids. The mound is at least three feet in diameter and two feet high. Scientific literature says that the mound structure, with various chambers for raising young, can extend three feet underground; one colony can remain active for ten to thirty years. The remains of an identical, relic mound lies about fifty feet upslope from this one and many other hillocks buried under the grass suggest where other old colonies may have been.

Many smaller mounds of the prairie mound ant, *Formica montana*, were also found along the north side of Spirit Mound Creek, near the new spur trail. These are smaller ants found in rich, moderately moist or floodplain prairies. Their mounds, mainly of soil particles, are very airy and chambered, using the prairie grass stalks, and roots that grow out into the mound, for structural support. The Trust placed an informational sign near one of these mounds. Parks Division staff in Pierre, believe it's probably the only South Dakota state park sign honoring an insect.

Although the ant multitudes are all that we usually see, ant colonies can actually be communities of many different creatures that have evolved various symbiotic relationships. There was a bumble flower beetle, (*Euphoria inda*), among the thatching ants this spring. This species lays its eggs in the colonies and the larvae eat plant material in the mound, apparently unmolested by the ants. A large, colorful carrion beetle, *Nicrophorus marginatus*, was also near the same mound. This species has been observed with *F. obscuripes* before, but apparently the relationship, if any, isn't known. And an adult glowworm (*Phenogodes* sp.) was seen going in and out of an *F. montana* mound; this genus preys on millipedes, so its association with the ants is a mystery. (An excellent paper on ants and the tallgrass prairie, by James Trager, can be read at www.npwrc.usgs.gov/resource/insects/ants/.)

Finding these ant populations on the mound helps confirm the value of our remnant areas and reminds us of the

wonder of the insect world. It also reinforces our desire to manage the Spirit Mound Historic Prairie with the immense diversity of prairie invertebrates in mind.



Photo by Mark Wetmore

Western Thatching Ant



Thank You Dianne

Trust board member Dianne Blankenship and her husband Bill have been tallgrass prairie enthusiasts for many years. They were instrumental almost 30 years ago in identifying and then organizing the Nature Conservancy's preservation of the 150 acre Sioux City Prairie. Our biodiversity efforts would not be possible without her knowledge and work. This year, along with botanist Brian Hazlett, board member from Briar Cliff University, she researched and tabulated over 230 species that are native to the area and appropriate for the mound's various habitats. She selected commercial seed sources, personally collected many species' seeds, determined best-practice seeding procedures, helped plant and seed on the mound, and carefully documented the entire effort.

We greatly appreciate her work.

Remnant Restoration

Mark Wetmore

In general, there are two kinds of prairie efforts on the mound: the *reconstruction* of prairie where previously there were fields or building sites, and the *restoration* of remnant areas. Although the goal of both are the same, they are working with very different resources.

Perhaps 10% of the Spirit Mound site is made up never-cultivated prairie remnants, primarily pasture areas on the summit or on steep slopes and along the creek. The state's prairie reconstruction efforts generally avoided these areas in order to leave undisturbed what native species remained.

Remnants are a precious resource for bringing back the original prairie. They are an ecosystem of plants, animals, insects, fungi, and other organisms, living in a web of interdependence which is tremendously hard to reproduce.

Unfortunately, almost all of these areas on the mound are degraded by non-native species crowding out the original ones. The most damaging is smooth brome grass, an aggressive cool-season grass that begins growing early in the year, before the native warm-season grasses and forbs get a chance to start.

One priority of the biodiversity project is to preserve and restore these remnants. Methods include burning, mowing, grazing, selected use of herbicides and over-seeding. Controlled burns are the sole responsibility of the Parks Division and will continue to be used as they are able. The trust is helping with the others.

Jody Moats Wins Award

This news item occurred just too late to be in last year's newsletter. Jody Moats, naturalist at the Adams Nature Center, won the Master Frontline Interpreter award from the National Association of Interpretation at their 2008 annual meeting in Portland, Oregon. Jody has conducted several programs at the mound every summer since it opened, and we really appreciate her efforts.

Crop Circles

Mark Wetmore

To experiment with a potential way of suppressing the brome without harming the native species, two twelve-foot diameter circles were laid out in the area west of the summit; and on April 14, both were sprayed with the comprehensive herbicide Glyphosate, isopropylamine salt (Roundup).

Although only done in two small places, tentative conclusions from the test are positive. The brome was completely absent all year and a variety of native plants grew robustly in the circles, even though they were stressed or completely missing from the area adjacent to the circles. Two natives were notable: hoary puccoon, an early-blooming forb which clearly was not harmed by the herbicide, and rough dropseed, a native grass which grew abundantly in one of the circles, but was invisible in the brome sod that surrounded the circle.

We intend to continue experimenting with herbicide on small areas of brome, including three circles that we treated November 5, when the brome was the only remaining green vegetation. Besides allowing existing native plants to grow freely, killing the brome creates open ground more conducive to over-seeding, which will be part of our continuing biodiversity project for 2010.

*These are the gardens of the desert these
The unshorn fields, boundless and beautiful
For which the speech of England has no name --
The Prairies.*

from William Cullen Bryant's
"The Prairies," 1832

Rich for a Weekend



On Friday, March 20, the Lewis & Clark - Spirit Mound Trust received an envelope from the South Dakota State Auditor's Office, containing a check made out to the trust for \$3,725,225.92. Our overjoyed treasurer thought maybe federal stimulus funds had reached the mound. But when asked the next Monday, after consulting his staff the state auditor decided the funds were really intended for the Lewis & Clark Regional Water System. He asked us to return the check, but did offer to send a stamped envelope for the purpose.

The Spirit Mound Trust Board of Directors
James Heisinger, President, Mark Wetmore, VP/Treasurer,
Dianne Blankenship, Tim Cowman, Wayne Evans,
Brian Hazlett, Jim Peterson, and Norma Wilson