Spirit Mound Trust News

P.O. Box 603, Vermillion, SD 57069 • info@spiritmound.org • www.spiritmound.org • Norma C. Wilson, Editor • December 2010

The Best of Times and the Worst of Times

Jim Heisinger

It was the best of times; it was the worst of times—a year of wild extremes that Charles Dickens might have loved. Our prairie caretaker, Spirit Mound Trust board member Ron Thaden, moved to Brookings. We knew we would miss Ron's tremendous and tireless efforts; we were surprised that agressive non-native plants seemed to sense his absence and proliferated with wild abandon.

Patches of sweet clover, hemp and Kochia scoparia (burning bush) invading areas along the trail were attacked by board members armed with lawn mowers and string trimmers.

Stimulated by record rainfalls numerous tree species began to tower above the prairie grasses. However, on May 17, the Vermillion Fire Department and state employees set a managed burn on the north third of the park. By the end of summer, a beautiful prairie populated largely by big and little bluestem, Indian grass and showy flowering forbs had reoccupied the burned area.

Junipers, buckthorn and elm had occupied the mound's central third. About 50 students from Vermillion High School came to rescue the prairie and spent "Volunteer Day" chopping and sawing them down, allowing the mound to take on a smooth natural prairie look. Because we did not apply a specialty herbicide to kill the cut stumps they will sprout with a vengeance next year. However, we plan a burn to set them back and encourage grasses and forbs next spring.

Fire is essential for maintaining a prairie. Many prairie ecologists feel that prior to European settlement Native Americans managed prairies with fire as their only tool. Lightning also can ignite prairies. Fire not only decreases trees, it increases the vigor of many prairie species. Since the retreat of the glaciers 15,000 years ago, prairie fauna and flora have been adapting to fires. This year's burn will be followed by taller grasses and a greater abundance of flowers.

Eagle Scout candidate, Andrew McCann's wild plum, buffalo berry and choke cherry trees survived their second summer and mark the transition between prairie and woodlot in the southeastern corner of the park. He also delivered a beautiful hand-built bench to the trail. This young man's efforts shined a happy light on prairie restoration.

Unfortunately the season was also a time of disappointment and loss. On or about the week of June 16th vandals who stole many botanical signs and destroyed a bench were as disruptive as the record rains, frequent flooding and omnipresent mosquitoes. However, water recedes, mosquitoes are confronted by the cold, and more people always step forward to enjoy, study and preserve Spirit Mound's flora and fauna. We anticipate another great prairie year in 2011.

Regal Fritillaries Return

Mark Wetmore

Regal fritillary butterflies are a marker species for native prairies. They have been in decline for many years and are monitored by the South Dakota Natural Heritage Program. In late summer females broadcast their eggs over prairie habitat, where they hatch; and the larvae over winter under vegetation. In the spring, only those that find prairie violet species to feed on have a chance to become adults. The regals seem to have disappeared from the mound's prairie remnant areas for the past five years, but were back this summer. Individual Regals were seen and photographed in both July and early September.

Photo by Mark Wetmore

Female regal fritillary 09-04-10

Prairie Sagewort: A Prairie Plant New to Spirit Mound Appears

Bill Blankenship

On Tuesday July 13, 2010 Jody Moats, naturalist at Maude Adams Nature Preserve, led a prairie walk at Spirit Mound. Toward the end of the walk, one of the participants noted a plant species not previously described for the Spirit Mound site. That plant was Prairie Sagewort or Artemisia frigida a member of the Sunflower Family (Asteraceae or formerly the Compositeae).

This low-spreading, tufted, woody, perennial plant, is best described as a sub shrub, generally one to one and a half feet tall (never to exceed two feet), and in dry conditions, it is often shorter. In the US it is found in western and southwestern states, but the plant is also cold-hearty and grows well in most of Canada and Alaska. In Midwestern and Great Plains sites, it prefers sandy or gravelly well-drained soils. Too much moisture can cause root rot. One of sixty-eight species of sages found in the US, (over 400 world-wide), it makes up a large percentage of sagebrush prairies. In fact, it is a dominant or co-dominant species in numerous habitat and community types. Other common names include Fringed Sage, Fringed Sagebrush, Fringed Sagewort, Pasture Sage, Prairie Sagebrush, Estafiata, Fringed Wormwood, Wormwood-Sage, Silky Wormwood, and Arctic Sagebrush. The Latin name is derived from Artemis the Greek goddess of the hunt, wild animals, and feminine matters (Diana in the Roman system). She was the twin sister of Apollo and usually carried a bow and arrow. The actual name Artemisia comes from King Mausolus's wife, Queen Artemisia who was a female botanist of Greece/Persia and died in 350 BC. She had been named for the goddess. "Frigida" means stiff and of the cold. This plant was described to science in 1804.

One of the most interesting features of the plant is its dual growth forms. Relatively few plants have this characteristic. The lower leaves have long leaf stems (petioles), that are very narrow (1 mm), and divided into three or more segments (ternate or pinnatifid). As one gazes up the plant to the taller stems, it becomes apparent that the leaves are less divided (even single) and have no leaf stem (sessile). This makes the plant appear to have fuzzier, bushier foliage below and sparser leaves on the ascending stems. It almost looks like there are two plants growing from the same rootstock. The plant as a whole has a soft texture, a silvery-white appearance (due to the many fine hairs on the leaves and even the stem), and a pleasant aromatic smell. The root structures are famous for their adaptability. In low moisture conditions (down to eight inches per year), taproots tend to form to seek deeper moisture. When water is more available, shallower, finer roots develop. The flowers are tiny, inconspicuous, dingy-yellow in color, and are usually found on the more meager upper stems. Since the disc and ray flower clusters are only ¼ inch across, the individual flowers are truly minuscule. They typically bloom in late July or August.

Photo by Bill Blankenship

Blankenship photo of sagewort

The plant is considered native to circum-boreal and steppe regions of the Northern Hemisphere. Plants found in the Northeastern US may arise from cultivars previously brought in by locals. At least some of these originated in Northeast Asia and have escaped or persisted from gardens and become naturalized. This is understandable because the plant has an attractive semi-evergreen silver color, and because of its cold and drought tolerance, it is easy to grow. It possesses a moderate ability to propagate on its own. Although two highly respected authors have categorized this plant as potentially invasive, two states (KS & WI) have listed it as threatened.

Although aromatic with the typical sage smell, the plant has not been used as a condiment (although it is edible), and it is generally considered useful for grazing and for re-vegetating suitable areas. The plant contains camphor-like terpenoids, which impart a harsh bitterness to the plant and tend to relegate it to a lower preference status for grazing. Although it lacks the small parachute (pappus) which many in this family use for seed dispersal, the strategy used by this plant is long persistence of the seeds in

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Sagewort continued

the soil seed bank. When conditions are favorable, a single plant may produce from hundreds to hundreds of thousands of seeds in a single season.

The root system has an associated fungus living within the roots (mycorrhizal association). Although fire top kills an individual plant, over time there is recovery from rootstocks, and fire is capable of increasing Fringed Sagewort due to better success of seedlings when cover is reduced.

Most ungulate animals utilize Fringed Sagewort for food, although more in winter than in other seasons. Often overlooked as a valuable forage species, it is actually quite important for this purpose as hoofed animals, small mammals and upland game birds utilize this plant as a significant food source.

Human uses of Fringed Sagewort are largely limited to its landscaping value due to its attractive foliage. Native Americans and early settlers used the plant for a variety of medicinal remedies for wide- ranging conditions as diverse as nosebleeds, sore feet, congestion, cough, colds, tuberculosis, toothache, varicose veins, eye-wash, menstrual difficulty, wound treatment, intestinal distress, cancer, diabetes, and even typhoid fever. There is no scientific verification of any of these uses. Non-medicinal uses included dyes, mosquito repellant, deodorant, to conceal the odor of unpreserved meat, as towels, toilet paper, in the treatment of hides, and for religious (ceremonial) uses.

Ours is the first recorded finding of Prairie Sagewort in Clay County South Dakota. However, the plant is distributed through most other counties in South Dakota, and it is the author's opinion, that it has been here all along, just overlooked. When you visit Spirit Mound next summer, watch for this friendly prairie citizen.

References: http://www.fs.fed.us/database/feis/plants/shrub/artfri/all.html
http://plants.usda.gov/java/profile?symbol=ARFR4

Wet Summer Impacts Spirit Mound

Mark Wetmore

An extraordinary amount of precipitation in the Vermillion area this year, including over 20 inches of rain in June and July, affected the mound in many ways.

The path was under water five times, and Parks Division staff twice reinforced washed-out underpinnings of the footbridge over Spirit Mound Creek. Their work held up well in the final, and probably severest flood after five inches of rain fell quickly on September 22nd. They also repaired a gully that had formed in the middle of the path from the parking lot, all the way to the bridge, as well as on the path north of the bridge.

Along the mowed spur trail north of the creek, the mound of prairie ants, identified by an interpretive sign placed by the Trust in 2009, was inundated by high water in July. A few workers remained around the anthill for a short while after the water receded, but the queen probably drowned. We hope that nearby ants will move into the area and start a new colony.

Disastrous conditions for some species were bountiful for others. Small fish swam in the creek all summer, and a great many more frogs than usual populated its banks. People who waded down the flooded path found, or rather, were found by, leeches. And mosquitoes were as overwhelming last summer, as in the days of Lewis & Clark. Many of the prairie plants, though adapted for dry conditions, seemed to thrive and grow larger this year; some of the big bluestem grew six or seven feet high, much taller than normal at the mound.

Photo by Mark Wetmore

Flooded mound path, 09-23-10

Celebrating the Holidays with River, Mound, Prairie, Sky

Spirit Mound Trust was a co-sponsor with Sierra Club's Living River Group and Vermillion Area Arts Council of an exhibit, "River, Mound, Prairie, Sky: Visual Art and Poetry Celebrating our Natural Environment." Works by thirty-one artists and poets were displayed December 4th and 5th at the historic Washington Street Arts Center, 202 Washington Street in Vermillion.

John Banasiak, Janet Beeman, Nancy Carlsen, Heather Cary, Sharon Gray, Susan Heggestad, Chuck Holmes, Sarah Horacek, Rick Johns, Virginia Johnson, Cindy Kirkeby, Nancy Losacker, Joe Night, Aaron Packard, Phyllis Packard, Sandy Robertson, Tori Law, Emma Pease and Tom Zak created the visual art. Ryan Allen, Mary Begley, Jan Evans, Brenda Johnson, Teniesha Kessler, Cindy Kirkeby, Ed Nesselhuf, Lindy Obach, Frank Pommersheim, Bruce Roseland, Elizabeth Schumacher and Norma Wilson wrote the poetry.

The art and poetry exhibit offering unique and diverse perspectives on our Missouri and Vermillion Rivers, Spirit Mound, prairie and sky opened Saturday, December 4th with a holiday party from 6-9 p.m. featuring jazz artists C. J. Kocher and Brad Richardson. Along with the music and art, hors d'oeuvres, desserts and drinks were provided. The exhibit continued Sunday, December 5th from 1-4 p.m., with light refreshments and a poetry reading from 2-3 p.m. This celebration of our area's art, poetry and natural environment was free and open to the public.

Big Turnout for Monarch Tagging Event

Mark Wetmore

Every September, Jody Moats, parks naturalist at the Adams Homestead and Nature Preserve, conducts a monarch tagging event at Spirit Mound. Recovered tags from the national effort yield information about the specie's life cycle and migration habits. Members of the final midwestern brood of monarch butterflies migrate to an area in the mountains of the Oyamel National Forest in western Mexico, where they overwinter and return north part way in the spring, to lay eggs for the new season's first generation of monarchs. A monarch tagged at the mound several years ago was recovered in Mexico (see the 2007 newsletter).

Participation in Jody's tagging program has grown each year, from very low attendance the first year to over 80 people this year, perhaps half of those children. Jody had to stand on a large rock near the parking lot to give her talk to the multitude. It was fascinating to watch released butterflies rise above people's heads to fly away south and satisfying to see the mound serve such a good, educational purpose.

A South Dakota public radio & TV crew filmed the event and segments were subsequently broadcast on both radio and television.

You can access them at http://sdpb.sd.gov/tv/shows.aspx?MediaID=58560&Parmtype=ADIO&ParmAccessLevel=sdpb-all and http://sdpb.sd.gov/tv/shows.aspx?MediaID=58694&Parmtype=TV&ParmAccessLevel=sdpb-all_

Photo by Mark Wetmore

Parents, children & reporters watch Jody tag a butterfly

Origin and Erosion of Spirit Mound

Cody Miller

Today Spirit Mound, known as Paha Wakan among people indigenous to the area, is of great historical and cultural significance to the surrounding area. However, little research has been done to determine the geological significance of this ice age feature. During the summer of 2010, USD Earth Science professor Dr. Mark Sweeney and Earth Science student Cody Miller studied the mound in order to classify it as one of the following glacial features: roche moutonnee, crag and tail, drumlin, or rock-cored drumlin. Sweeney and Miller also studied erosion of the mound by hand augering its soils and referencing Lewis and Clark documents to see if any erosion has taken place since the two captains stood atop the mound in 1804.

Spirit Mound Trust had previously been classified a roche mountonnee, an elongated mound of bedrock worn smooth and rounded by glacial abrasion. However, Miller and Sweeney think this designation is incorrect because the mound is not entirely constructed of bedrock, and also because the orientation of the lee (steep) and stoss (gentle sloping) sides of Spirit Mound is inconsistent with roche mountonnee gneiss from ice flowing north to south. Based on the orientation of the lee and stoss sides, the presence of Niobrara Chalk at its core, and several pieces of the Niobrara Chalk and other pebbles they found in auger samples from the till surrounding the mound, Sweeney and Miller classify the mound as a rock-cored drumlin. A rock-cored drumlin is a smooth, streamlined hill molded by glacial erosion, which has a core of bedrock usually covered with a layer of glacial till extending in the direction of ice movement, in this case, north to south.

To find out if any erosion had taken place since 1804, Sweeney and Miller surveyed the mound, comparing their measurements to those of Lewis and Clark in order to determine whether the mound has eroded during the past two centuries. Their measurements are roughly the same as those of Lewis and Clark, except for the size of the flat area at the summit. Lewis and Clark measured it half as wide and three times as long. Erosion could account for this drastic change. Sweeney and Miller sampled soil from 11 different locations around the mound looking for buried soil, a strong sign of erosion. From their data, they concluded that only the northeast corner of Spirit Mound experienced significant erosion. The erosion more than likely occurred during the mound's feedlot years because of the lack of vegetation and increased cattle traffic. Photos taken in the 1980s of the feedlot on the northeast margin of the mound show some areas of exposed soil, making erosion more likely.

In addition, they found that the trail leading up to the summit of Spirit Mound is currently susceptible to erosion, documented this summer after heavy rains. Undoubtedly, Spirit Mound is important both culturally and historically: and more research, like that of Sweeney and Miller, needs be done to better determine its geologic history.

Editor's note: Sweeney and Miller's project was featured in a front-page story by the Sioux City Journal, Novermber 7, 2010.

Support Spirit Mound

We welcome your membership in Spirit Mound Trust and invite you to join us as volunteers working to preserve and renew this important landmark. If you would like an update on Spirit Mound in 2011, please send your $10 membership fee. Additional donations are welcome and tax deductible. Our address is P.O. Box 603, Vermillion, SD 57069.

To Spirit Mound

Legends of fierce tree dwellers respected
and feared for hundreds of miles made me want
to know you. I climbed through dense sandburs and
hemp to your summit and found there a stone
placed by "Paha Wakan" Daughters who took
your name. White-faced cattle stared up at me.
I gazed in awe at the distant southern
horizon. I listened to the wind, the
Meadowlark, and Little Owl's story of
Lone Man, the flood, the cottonwood shelter
built on your summit. Turtle drum birthplace,
you renew my spirit. Pregnant with my
first child, I knew you were a woman in
repose, waiting for birth. For love we have
clothed you with butterfly milkweed, vervain,
Indian grass, little bluestem, and meadow
roses, longing to give back the life
invaders took away

Norma Wilson

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Mound Delivers for Birder Group

Mark Wetmore

In early October, the South Dakota Ornithologists' Union held their fall meeting and paper session in Vermillion. USD ornithologist Dave Swanson led an early-morning field trip to Spirit Mound, in hopes of seeing migrating Le Conte's sparrows, as well as other prairie species. Le Conte's don't nest in the area, but seek out prairie habitat in their spring and fall migrations; their status is listed as uncommon migrants in eastern South Dakota.

As the group of about 20 birders stood near the creek in the dim dawn light, an American Bittern, a brown, medium-sized heron with a wingspan of about three feet, circled silently just a few feet over their heads, and landed by the water. At about the same time, Le Conte's sparrows became visible in the grass along the path. The attractive little birds were fairly tame as well as plentiful; one participant estimated that there were over 100 of them that morning.

The group eventually reached the summit of the mound and saw several other species on the walk, including a pair of gray partridges that flushed right at the feet of some of the birders.

Photo by Mark Wetmore

Le Conte's sparrow at Spirit Mound 10-10-10