

SEEDS OF DIVERSITY



Iowa DNR Prairie Seed Harvest Team

March 2006

The Emergence of a New Wildlife Unit

Gradually developing over the last five and a half years, the Prairie Seed Harvest Team will finally fledge from its temporary roots at Ledges State Park and relocate to its new permanent home at Brushy Creek State Recreation Area in Webster County. Perched atop a prairie hilltop due south of the Brushy Creek Headquarters and due north of Mount Tired, a remnant-covered hillside emerging steeply from the Brushy Creek bottoms, are two Ivory Giants, one an office building/shop, and the other a cold-storage building. The building site, enclosed by a security fence, also contains a large maintenance yard.

The office building, which is 40 ft. by 100 ft., contains two offices, a heated shop, a seed cleaning lab, men's and women's restrooms, a kitchen/breakroom, and a conference room with an attached greenhouse. The cold-storage building is 40 ft. by 80 ft. and has a concrete floor. A parking lot is located outside the enclosure on the west side of the office building. A nice entryway will allow visitors to enter the building and have access to either office or the conference room.

The buildings are awaiting final finishing touches, and we are planning on moving in late April or early May. The cold-storage building will be available late this month to move equipment to our new headquarters.

The land available at Brushy Creek State Recreation Area is set up for habitat improvement and ecotype field establishment. The good working relationship between the Brushy Creek Crew and the Prairie Seed Harvest Team allows for the efficiency of a large, for-profit farm operation. We have been able to divide the 7500-acre recreation area into segments for each zone of seed we raise (North, Central, and South), with

IN THIS ISSUE:

- Page 1- The Emergence of New Wildlife Unit
- Page 2- Learning More About Caterpillars in Prairies
- Page 4- Feature Species: Lousewort Germination article
- Page 5- Employee Profile

enough space between segments to maintain zone integrity. We will begin to establish combinable fields of forbs for each zone to insure all seed orders can be filled. Please note that not all forbs can be grown and harvested in a field situation. Both mixed-species fields (grasses and forbs) and single-species grass fields are being established for each zone as well. All in all, we will be able to provide a minimum of five species of grasses and fifty species of forbs within a couple of years, which we have already surpassed in two zones. Between fall and spring seed orders, we have over 1600 acres of native grass and mixed forb plantings to fill, and we usually have several additional orders later.

Last, but not least, we are starting to plan for this spring's Prairie Work Days. Currently, we are planning for work days at, Big Sioux Unit Headquarters, Decorah Trout Hatchery, and Ledges State Park. If anyone else is interested in a Prairie Work Day, please let us know. Plants (plugs) may not be available this year when this newsletter comes out, but we can plan for a great event next year.

Learning More About Caterpillars in Prairies

Written by: Eric Metzler

Prairies are most often recognized by the plants growing there because plants visually dominate the natural prairie environment. Prairie enthusiasts look for beauty in plants both large and small, and prairie enthusiasts want to protect the plants and their environment. Evidence of eating by insects, often called damage, on plants is sometimes seen as a bad thing. For example, a plant with imperfect leaves or blossoms, as a result of being eaten by insects, is often considered a plant under attack, and insects are called pests. Yet, in the natural scheme of things, grazing on plants in prairies by mammalian herbivores, such as bison, is seen as a good thing. Grazing by bison is good while grazing by caterpillars and insects is not good? What is the difference?



Photo by MJ Hatfield

White Lined Sphinx Moth

Past issues of the Prairie Seed Harvest Team's newsletter have had wonderful photos of prairies, plants, and insects. Why insects? The message is subtle and very important. Of all the plants and animals on Earth, insects account for more than ½ the species. The mass of all insects is more than the mass of all other animals. In an average acre of prairie, there are nearly ten million insects. Most insects are very small, yet they are critical to the functioning environment of prairies.

Not all insects eat plants. Many species eat other insects or parasitize them. From the perspective of an insect which eats plants, they do not attack plants. Insects are doing what we all do for survival, they eat. Some insects have negative impacts where others have positive impacts, and even insects that eat leaves may have an overall positive impact. Many plants that are eaten by insects have self defense. Some of these plants emit chemicals that attract additional insects to prey on or parasitize the insects which are eating the leaves. A plant may benefit from the sacrifice of one leaf in order to benefit from increased protection by predators or parasites.

Butterflies and moths account for 13 percent of all insects. Caterpillars of nearly all butterflies and moths eat plants; they are important in the environment. We nearly all agree that butterflies

are good, but many people perceive moths as not so good. We tolerate caterpillars of butterflies because they produce butterflies, but moth caterpillars often evoke a more negative reaction. In the world of Lepidoptera, butterflies constitute 6 percent while moths constitute a whopping 94 percent. Most moths are very small, and many of them are active at night and unseen by humans, yet their impact is enormous. What good are they?



Photo by MJ Hatfield

Moth Proboscis (White Lined Sphinx)

While butterflies are active during the day, often pollinating flowers when visiting for nectar, moths do the same thing at night. Blossoms of milkweed plants which are so attractive to butterflies during the day are equally attractive to moths at night, when moths pollinate flowers. Some flowers are open only at night, and their pollinators must be moths. Some orchids require the moths' extra long proboscis, which looks like a coiled tongue, for pollination, and without moths, these flowers would never be pollinated. These species of moths are of high value because their caterpillars keep birds alive, and pollination activities of adult moths are required by the plants. This is a win/win situation.

Sadly, scientists know far too little about moths and their caterpillars. There are more than 14,000 species of moths in North America, and nothing is known about the life histories for more than 50 percent of these species. Without prairies the moths would disappear, yet the complete interactions of prairies and moths cannot be known until more is known about moths. People who visit prairies often have an excellent opportunity to contribute to the knowledge about these animals.

When caterpillars are found they should be photographed from the top, bottom and side with the head included in the photo. The plant being eaten by the caterpillar should be recorded. Some caterpillars eat only leaves, flowers, seeds, and many species bore into the leaves or stems. All these details should be noted along with exact dates of observations. When possible, location of the caterpillars should be marked with flags for further observation, and if at all possible, caterpillars should be collected along with the plant being eaten, so the caterpillar can be raised in captivity. In most cases, the only way it is possible to know the exact identity of the caterpillar is to wait for an adult butterfly or moth to emerge. The adult can be kept in a container in a freezer while waiting for identification.

A caterpillar eating rosin-weed (*Silphium integrifolium*) in a prairie in south central Wisconsin was reared and discovered to be *Tebenna silphiella*, a species of moth known from only 6 specimens and not seen for nearly 100 years (For more information visit, <http://www.dnr.state.wi.us/org/es/science/inventory/moth.htm>). If prairie expert and owner Richard A. Henderson, had not made an effort to discover the identity of this species of moth, it might still be unknown to the scientific community. Each prairie visitor can make a difference in what is known about the complex communities of prairies.

Questions or comments contact Eric Metzler at P.O. Box 45 Alamogordo, New Mexico, 88311 or email spruance@charter.net.

Feature Species: Lousewort



Lousewort, Wood betony, Canadian lousewort, and *Pedicularis canadensis* are all names for this delightful spring prairie and savannah plant. It is perennial and a member of the Figwort/snapdragon or *Scrophulariaceae* family. It is a low grower reaching heights of just 6"-10" with deeply cut, hairy, basal leaves which are sometimes mistaken for fern fronds. Over the years individual plants will off shoot to make good sized clumps. It is easily grown from seed but not in a greenhouse situation. It can

be parasitic; therefore, it is not suitable for plot production. However, it is on our list to grow in mixed forb production fields and will make a great addition to diverse prairie plantings.

If you have access to Lousewort seeds, please collect some for us so that we can eventually provide the DNR wildlife units with seed of this springtime plant. Remember to note the location of your seed source. Thank you.

My Winter Hot Spot

Written by: Susan Clark



Montrose Greenhouse

Call me crazy, but I'm not much of a warm-weather person - I'll take drifts of snow over white sand beaches any day. (What?!?! I'm the only one?) However, after a long, cold winter of cleaning prairie grass and wildflower seed with the Prairie Seed Harvest Team, I'm ready to head south for a little warmth. Oh no, not Cancun or Daytona Beach, I'm talking southern Iowa, baby. That's where I've spent a great deal of my time over the past several years working in a warm, climate-controlled greenhouse (if I squint hard enough, I can see the ocean) while the wind and snow swirl outside.

Not all of that clean seed is distributed to Iowa DNR wildlife units and state parks for wildlife habitat. Some of it is needed to germinate plants in our greenhouse located at the Iowa State Penitentiary Farm 3 near Montrose. We, also, use greenhouses at the North Central Correctional Facility (Rockwell City), Fort Dodge Correctional Facility, and Iowa Medical Classification Center at Oakdale.

The seed is prepared months in advance before it is planted. Three processes are used to mimic nature to break seed dormancy, enabling seed to germinate. Legumes (i.e. Lead plant and Purple prairie clover) or other hard seeds are scarified to scratch the seed coat, thus allowing water to enter and the seed to germinate. The scarifier is a small machine (similar to a rock polisher) with four, thick metal blades and a coffee-can-size container that is lined with coarse sandpaper. The blades spin inside the removable container to agitate seed against the sandpaper. Seed is scarified for 10 or more seconds depending on the size and delicacy of the seed. Scarifying too long can damage the seed. This seed is then stored in a refrigerator or freezer until needed.

Seed of some species (i.e. Prairie violets and Wild petunia) are treated with a gibberellic acid solution 24 hours before planting. Gibberellic acid is a natural hormone (it is extracted from a fungus) that stimulates the growth of seed that may be a little more difficult to germinate or needs prolonged treatment. Gibberellic acid is added to equal parts seed and sand in a plastic storage bag and allowed to penetrate through the seed coat.

Most of our seed is cold stratified before it can be used in the greenhouse. Stratification is a process that sends seed through a cold cycle to break dormancy before it is planted. Seed is mixed with silica sand and water then placed in a freezer or refrigerator for 30-120 days. Freezing of sand and water helps to break down the seed coat, allow water to enter, and stimulate seed growth. Mixing seed with sand, also, helps to evenly spread seed (especially tiny seed) over the potting media in the greenhouse. Once the stratification period is finished, seed is ready to be sown in the greenhouse.



Separating roots in germination tray

The seed or seed/sand mix is spread on top of moist potting media in a germination tray. Depending on the species, the seed is lightly covered with vermiculite to aid in water retention (Learn more about vermiculite at: www.vermiculite.org/aboutvermiculite.htm). The tray is then labeled and covered with a clear humidity dome (once again depending on species). The dome creates a mini-greenhouse until the seeds begin to sprout and at this point the dome is removed. At times the domes need to be vented to prevent overheating and excess moisture retention (which may lead to mold and fungus growth). The dome is removed on rainy or cloudy days to aid in air circulation. Once seedlings produce true leaves (which are the second set of leaves) or are at least an inch tall, they are transplanted to plug trays. This is the most tedious part of the germination process. Each tiny plant must be carefully separated from each other with roots intact. We use a sharpened lead pencil to separate roots. Compare this to a little girl's rat's-nest-head-of-hair and a parent trying to delicately comb out the mess without the child crying and without leaving a bald spot (flashbacks to my own childhood involving a wad of gum). Plug trays that hold 38, 72, or 98 plants are used depending on what seedling sizes are desired or that best suits a species. A plug tray is filled with moist potting media that is treated with the granular pesticide Marathon®. (Precautions are taken and protective gloves are worn during this and the following steps.) We use the pencil to push a hole in the media for the plant. Seedling roots are gently pushed into the hole and covered with media to prevent them from drying out. Newly transplanted seedlings are then saturated with a Banrot® solution to prevent and kill fungus on developing roots and stems. Banrot® is applied to the seedlings every 2-4 weeks or as needed. When all transplanting is done, each greenhouse may have as many as 30,000 plants.

After several weeks of growth, seedlings are fertilized every 4-6 weeks until they reach a desired size. If the need arises, we treat the plants with pesticides. We are currently experimenting with predatory insects at the Oakdale prison to limit the use of pesticides.

Meticulous records are kept regarding daily care, watering, insect problems, and possible die-off.

Beginning this year at Farm 3, the inmates receive guidance from Iowa DNR State Forest Nursery Manager Lisa Hoffmann and Tech 2 Christina Holtkamp. At the other prisons, prison staff members supervise inmates. After initial sowing and transplanting, inmates do the work (other than pesticide treatment). Inmates record data as they continue to transplant, water, and care for the seedlings until they are large enough to be planted. Then the seedlings are either planted in our eco-type production plots or as part of prairie workdays throughout the state. We then harvest seed from the mature plants at our plots.... when the hot sun is beating down and I'm longing for cold, snowy days.

Please welcome **Jeremiah Manken**, the newest AmeriCorps member to the Prairie Seed Harvest Team. He is a summer 2005 graduate from Iowa State with a BS in Animal Ecology with an option in wildlife. He previously worked as a Summer Aide at Ledges State Park, volunteered over 200 hours with the Wildlife Diversity Program, and has worked construction specializing in vinyl siding and windows.

Originally from Worthington, Minnesota, Jeremiah currently lives in Ogden. His hobbies include hunting and riding horses. His Golden Retriever, Sarah can be found at his side during hunting season and his horses Sheba, Breeze, and Bozo take up the remainder of his free time.

Checkout Our New Website

All of our newsletters issues are now available on the DNR website! Please follow these easy steps:

1. Go to the Iowa DNR website (<http://www.iowadnr.com/>)
2. Under **Outdoor Recreation** click on **Wildlife**
3. Then click on the **Prairie Seed Harvest Team**