SEEDS OF DIVERSITY

Pasque flower

Iowa DNR Prairie Resource Unit **March 2009**

Prairie Roots

The visual - above ground portion of the plant many times gets the recognition for the wildlife habitat it provides or the beauty that it adds to the landscape. Pasque flower (April fool's flower) is one of the early spring bloomers in the prairie. It has beauty that is valued by many early in the spring as the prairie awakens from its long winter's nap. Invisible are some of the most amazing prairie phenomena--the roots of the prairie. Prairie has two-thirds of its biomass below ground. These roots are keys to improved soil fertility, food, improved water quality, and sustainability of prairie reconstruction or remnant.

Prairie roots come in two basic forms: large, tap-rooted species and fibrous-vegetative species. Compass plant has one of the most impressive root systems. It forms a long tap root that can extend many feet below ground. I have seen a demonstration with Compass plant root that surpasses twenty feet in length. This long root has the ability to search the depths for water even in the driest of seasons. Its extensive root system stands up very well to mowing and loss of above-ground leaves. In fact, I have seen a plant located in the road ditch, where the sod and top few inches of soil were removed, and it resprouted from reserves in that massive tap root. The plant's expansive tap root lies below the earth protected from scorching fire that burns and weakens the less tolerant plants. This deep root system aerates the soil allowing slow infiltration of water into the soil, and decreases the amount of runoff after a rainfall event, reducing the quantity of water carrying soil and nutrients directly into lakes and streams.

Other prairie species have a different approach to root growth and form. Species such as Prairie cord grass have an extensive fibrous and rhizomatous root system that does not go deep into the soil but is extensive in the top 6-12 inches. These species tend to be sod forming and can typically be seen in large patches in a prairie. Species with fibrous root systems latch on to soil, keeping it in place versus flowing offsite. Many of the rhizomatous species, such as Cord grass, Blue joint grass, Coreopsis palmata, and many of the sedge species, form dense patches of above-ground plants. Seeds from these species are sometimes difficult to collect because they put a lot of their energy into asexual reproduction (rhizomes).

Roots are also a food source for a number of invertebrate and vertebrate species. We have learned this first hand with Prairie blazing star. Prairie blazing star forms small bulblike structures (corms) below the surface. They are for food storage and vegetative reproduction. Corms are espe-

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cially tasty to 13-lined ground squirrels. We planted over 1000 Prairie blazing star seedlings in our seed production plot in 2003, only to have it decimated in two weeks by 13-lined ground squirrels. They would dig and eat the corms leaving the small stem and leaves to wither in the sun. June bug's larvae eat Prairie blazing star corms, also. We discovered this when we divided some corms from our production plot. Many of the corms had a small grub in the center that ate and killed the original plant, but the surrounding corms (vegetative growth) were still viable.

Prairie legume species such as Purple prairie clover have the ability to fix nitrogen in the soil. Native legumes (Fabaceae family) have root nodules that are formed when symbiotic bacteria called rhizobia interact with the plant's roots. Rhizobia fix nitrogen for the plant and in turn the plant provides the bacteria (rhizobia) with food. When the plant dies, fixed nitrogen is released, making it available to other plants and thus improving soil fertility.

Prairie blazing star

Purple prairie clover

Many people think the ground shade provided by tall prairie grasses is a key to keeping out invasive species such as Canada thistles. Roots are probably a bigger factor to keeping out invasive species. A diverse prairie has many different root structures intertwined beneath the soil from long tap roots, fibrous-vegetative roots, and some root systems that do not fit in either category because they show pieces of both fibrous and tap root systems. A new species trying to get established has difficulty competing with an established diverse prairie reconstruction or remnant. This is especially true in times of limited resource such as drought. However, diverse prairie is not a silver bullet with invasive species; there are some invasive species that do well in a prairie system, but it does provide a good shield against most invasive species.

There are many reasons to appreciate prairie. The visual, above-ground portion of the plant many times gets recognition for the wildlife habitat it provides or the beauty that it adds to the landscape. The below-ground elements of the prairie are the under-appreciated workers that help make the system sustainable, improve water quality, provide food for wildlife and increase soil fertility.

Species spotlight: Hoary Puccoon

By Jacob Hart

Hoary puccoon *(Lithospermum canescens)* gets its name from its stone-like seeds and its hoary or whitish appearance. Hoary puccoon is in the (Boraginaceae) forget-me-not family. This plant can be found throughout the prairie in many different soil types but prefers dryer sites. It is also found in savannas and along woodland edges. Hoary puccoon is considered an indicator species because it is found only on high quality prairie and savanna remnants. Hoary puccoon can be found throughout Iowa in some of these high quality prairies.

This perennial has several stems per plant that are anywhere from six inches to a foot and a half tall. Leaves are small, alternate and have a prominent vein down the middle. Part of its name comes from the tiny white hairs that cover the stem and leaves. The root system is a central taproot that is reddish in color. Puccoon is the Native American word for plants that yield dye which is also how this species got its name. Its roots were utilized for making red dye. The flower is yellow-orange forming clusters at stem tops. It is small in size, only half an inch wide, has five distinct lobes, and can be seen flowering early May until mid June.

The seeds, an eighth of an inch long, resemble small polished stones. They were used as a sacred bead by the Menominee Indians in special ceremonies. Hoary puccoon seed is difficult to collect and very tough to germinate, which is why we have yet to add it to our propagated species. Because this species is an indicator of high quality prairie, proper care must be given to areas that contain this unique plant. Invasive species control, brush removal and fire must be used to maintain high quality sites. Next time you are out on one of Iowa's high quality prairies look for this indicator species.

Earth Day Volunteer Event

Saturday, April 18th 2009

Save the Date!

Geo-caching, Garlic Mustard Pull & Prairie Night Burn!

1:00 – 4:00 Cache-In, Trash Out

Get out and explore nature! Using GPS units participants will hike through the park locating caches (hidden "treasures") and picking up trash along the way.

4:00 Garlic Mustard Pull

Help restore habitat by removing the invasive species garlic mustard. A quick lesson on identifying the invasive mustard and learning the agency's plan of attack will precede the pull. Hot dogs will be provided for supper following the event, bring your own beverage.

7:00 Prairie Night Burn

Experience the thrill of a controlled fire at dusk! Join experts for a brief lesson in prairie management followed by a prairie burn (weather permitting) at a remote site.
Witness a glimpse into history and learn about the importance of this effective management tool.

This is a free family event sponsored by the Iowa DNR and Webster County Conservation. Each event will begin at the Brushy Creek Prairie Resource Center. Be sure to wear work clothes, sturdy shoes and gloves. Bags will be provided for trash and garlic mustard.

Directions to Brushy Creek: From Hwy 20 - Turn south on County blacktop P73. just south of Duncombe exit, there is a sign for Brushy Creek Park. Continue south approximately 3.5 miles. Turn east on Lake view drive. This road winds thru the park, past the campground, across the dam and finally turns south just east of the dam. The Prairie Resource Center will be the 2nd set of buildings on the east side of the road. There is a sign in front of the office.

For cancellation, listen to local radio stations. There is no rain date scheduled.

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