Butterfly Survey at Cedar River Natural Area
Nick Tebockhorst, Biology ’12/TPC student employee

This past summer I had the opportunity to take part in an undergraduate research program here at the University of Northern Iowa Biology Department. Our lab investigated butterfly populations at the Tallgrass Prairie Center’s experimental prairie site used for biomass harvest and ultimately electrical generation. We completed six surveys in the months of June and July and what we found was astonishing. We recorded 799 butterfly observances representing 24 different species. The most popular plants we found butterflies feeding on were pale purple coneflower (*Echinacea pallida*), wild bergamot (*Mondara fistulosa*), and oxeye sunflower (*Helianthus helianthoides*). This coincides with our hypothesis that plantings for biomass production that include forbs with grass species provide greater ecological value than plantings of just grass species. Among the butterflies we recorded were great spangled fritillaries (*Speyeria cybele*), painted ladies (*Vanessa cardui*); and a new record for Black Hawk County, a pipevine swallowtail (*Battus philenor,* photo). Over the course of the summer, it became clear to me just how important prairie flowers are to butterflies. The forbs in our prairie were one of the few available nectar sources available due to the drought. For more information on this study, contact Nick TeBockhorst at ntebockh@uni.edu. Special thanks to Dr. Mark Myers. Photos courtesy of Jarrett Pfrimmer.

Renewed Assault on Prairie
Daryl Smith

No doubt some of you have been reading about the latest assault on the formerly vast prairie ecosystem. Once again the prairie is undergoing an extensive conversion to row crops. Approximately 162 million hectares (395 million acres) of prairie vegetation once occupied mid-continent North America prior to Euro-American settlement. The vast prairie landscape of tallgrass, mixed grass and shortgrass stretched from the Wabash River in Indiana to the foothills of the Rocky Mountains. A review of the magnitude and stages of the historic loss of tallgrass prairie in the 19th and early to mid-20th centuries is in Smith 1992 (full citation at end of article).

The second assault was on the southern Great Plains when farm acreage doubled between 1900 and 1920, then tripled between 1925 and 1930. The result was the Dust Bowl affecting 100 million acres of prairie.

In the mid 1990s, Samson and Knopf (1994) provided a summary of the estimated current area, historic area, and percent decline of the tallgrass, mixed grass and short grass prairies. Like Iowa, tallgrass prairie in most states had declined 99.9%. The shallow, rocky, untillable soil of the Flint Hills of Kansas reduced the amount of decline in Kansas. The decline in tallgrass prairie exceeded that reported for any other major ecosystem in North America. Mixed grass decline ranged from lows in Wyoming and Texas to greater amounts in the provinces of Canada. Information regarding Montana was apparently not included in their survey. In the past 20 years there has been an increasing tendency in the Northern Great Plains to push cropland further west. Also, once again there is an increase in cultivating cropland in the Southern Great Plains. The trauma of the Dust Bowl Era seems to have been...
forgotten as new varieties of genetically modified corn and soybeans allow the planting of row crops on land once better suited to grazing cattle. During 1989-2003, the most rapid conversion of grassland to crop uses occurred in the northern plains prairie pothole region where loss rates sampled suggested 0.4% loss of grassland/year. However, the conversion has accelerated in recent years. More recent estimates for about the same area indicate the annual rate of loss has doubled to 0.95%. That rate is greater than the rate of deforestation of the Amazon. Satellite imagery shows that the rate of land conversion nationally has exploded since 2008. In just four years, some 9.6 million hectares (23.7 million acres) of grasslands, wetlands and shrublands have been converted to row crops. The accompanying map (Figure 1) illustrates the number of acres of grassland and wetlands converted to cropland in the prairie pothole region of the northern prairie from 2008 to 2011.

Record high commodity prices and demand for ethanol, as well as rising global demand for food and energy, and advances in farm technology have tempted many farmers to convert parts of prairies, pastures and waterways into more lucrative row crops. The accompanying map (Figure 1) illustrates the number of acres of grassland and wetlands converted to cropland in the prairie pothole region of the northern prairie from 2008 to 2011.

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Map produced by the Environmental Working Group using U.S. Dept. of Agriculture’s National Agriculture Statistics Service cropland data.

Questions/comments email daryl.smith@uni.edu, or call 319-273-2238.


Practical Data Collection: Establishing Methods and Procedures for Measuring Water Clarity and Turbidity of Stormwater Runoff from Active Highway Construction Sites.

Becky Kauten

In the spring of 2012, a new project launched at UNI in collaboration with the Iowa Department of Transportation (DOT). Through an agreement with the Iowa DOT Office of Construction, UNI is working on a water monitoring project related to stormwater runoff from active construction sites. The goal is to establish a protocol for regular sampling by DOT and its partners, as well as determine a cost-effective means of data collection that can be applied on an agency-wide scale.

Background: In 2009, The US Environmental Protection Agency (EPA) proposed including effluent limitation guidelines, or ELGs, regarding the amount of sediment allowed to discharge from an active construction site. Initially, this guideline came with a numerical standard, however no such number currently exists in the
A "stilling well" holds a pressure transducer. This device measures stream stage in 15-minute increments.

Several water samples are collected from active construction sites, analyzing the samples and reporting based on existing and developing protocols.

On-site monitoring includes similar measurements, as well as pH, dissolved oxygen, and habitat assessments based on IOWATER protocols.

To learn more about this project, email rebecca.kauten@uni.edu, or call 319-273-3856

Seven Things to consider when hand collecting prairie seed - Dave Williams

It is fall in Iowa and time to collect seed. As you go out into prairie plantings in coming weeks, here are some tips to ensure your efforts are successful:

1. Know how to identify the species you want to collect. A dried prairie plant may look quite different than when it’s actively growing. The easiest way to identify a dried plant in the field is to find them when they are flowering during the growing season, mark their location and return often to see how the plant changes as it goes dormant. If you run across an unknown plant when seed collecting in the fall and want to collect seed from it, keep it separate from the other seed until you can positively identify it. There are a lot of non-native plants out there so be careful.

2. Know what the seed looks like. Dried flower parts can sometimes look like seeds, so you need to know where to look. Seeds in a compass plant flower for example, are clustered in a circular band around the outside of the center portion of the flower (Figure 1) and are typically dark colored and swollen in the center. For more information on seed identification check out “The Tallgrass Prairie Center guide to seed and seedling identification” by Williams and Butler.

3. Know when to collect. Collecting seeds when ripe will maximize germination and collected seed can be stored longer before planting. You can predict optimum seed collecting times based upon your region’s longitude and established blooming patterns. In central Iowa for example, spring flowering species, such as prairie smoke (Geum triflorum), will have ripe seed in mid-June. In northern Minnesota however, prairie smoke seed will ripen later in June since the growing season starts later. A good rule of thumb to follow is to look at the stem below the seed head. If it is discolored (brown or black) and dry, it is likely ripe. A sure way to determine if a seed is ripe is to place the seed on a hard surface and gently apply pressure with your thumbnail.

4. Get permission. This is not a concern if you are collecting seed around the outside of the center portion of the flower (Figure 1) and are typically dark colored and swollen in the center. For more information on seed identification check out “The Tallgrass Prairie Center guide to seed and seedling identification” by Williams and Butler.

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Reachin’ Out (!) to a Different Kind of Audience
Ryan Welch

About a year ago it was with heavy heart that I left my position as Outreach Coordinator at the Tallgrass Prairie Center. I had the opportunity to take a job closer to family teaching at a local community college. Initially I was unsure of how I would be able to work my past skill set of informing the public, organizing educational seminars, and spreading the mission of the Tallgrass Prairie Center into this new role. I soon found, however, that my students were enthusiastic to learn about local ecosystems. From day one, I took my Environmental Science labs into the field to show students the natural areas around them. Many students had never been to any natural areas, even those that literally were within minutes of their homes. I took them to prairie roadside ditches, upland forests, remnant limestone prairies, and floodplain forests. While all of the locales were not glamorous, the students came away from each area with a better sense of the world around them and more aware of local opportunities to experience nature.

All too often as educators and advocates, we sometimes lose sight of the bigger picture while focusing on the finer details of our craft. It was of greater benefit for my students to go out and explore a natural area, no matter what its condition, than to hear me lecture about the finer points in a classroom with powerpoint slides. So while I may no longer be employed with the Tallgrass Prairie Center, I am still doing outreach, education, and advocacy of the prairie, just to a more localized audience, teaching them to think globally, while looking and acting locally. Reach out! No worries.

Ryan’s Reachin’ Out! Cowboy Cookies (made famous because he baked them fresh for each TPC Seminar he organized):

2 cups flour  ½ t baking powder
1 t baking soda  1 cup butter or margarine
½ t salt  1 cup sugar
2 eggs  1 cup brown sugar
1 t vanilla  12 oz choc. chips/ coconut
1 cup Rice Krispies  1 cup oatmeal

Cream together the sugars and butter/margarine. Then add all of the dry ingredients and mix. Then add all of the liquid ingredients and mix. Then stir in the cereals, chocolate chips and coconut. Place spoon sized cookies on a greased cookie sheet and bake at 375 ° for 10-12 minutes. They keep longer if you freeze them, and/or hide them from Greg.