



TALLGRASS PRAIRIE CENTER NEWS

UNIVERSITY OF NORTHERN IOWA

The Tallgrass Prairie Center restores native vegetation for the benefit of society and environment through research, education, and technology.

FALL 2015



Black Soil and Gold Hues: 29th Roadside Conference

Kristine Nemec, IRVM Program Manager

- kristine.nemec@uni.edu

The 29th annual roadside conference drew over 100 people to the Coralville Marriott Hotel and Conference Center in September. Keynote speaker Dr. Steve Hendrix, Professor Emeritus with the University of Iowa, spoke about bee species and prairie plants. He said prairie plants species that are common in prairie restorations and are especially attractive to many bee species include golden alexanders (*Zizia aurea*), leadplant (*Amorpha canescens*), purple prairie clover (*Dalea purpurea*), and grey-headed coneflower (*Ratibida pinnata*). All are typically included in the seed mixes planted along Iowa county roadsides. The Friday morning keynote speaker, Ingrid Anderson, environmental compliance specialist with the University of Iowa, spoke about the Iowa biomass and Miscanthus projects. Other topics included utilities and roadside safety, pesticide complaint investigations, the Minnesota DOT's Roadsides for Wildlife program, and roadside aquatic and bareground herbicide selection. Chris Henze, Johnson County roadside manager, tested people's botany and roadside knowledge in an entertaining game of roadside jeopardy. This year four roadside managers earned awards for 10 years of service to Integrated Roadside Vegetation Management: Wes Gibbs (Jones County), Sherlyn Hazen (Buchanan County), Ben Hoskinson (Mahaska County), and Jim Uthe (Dallas County).

Warm weather prevailed for the popular outdoor portion of the conference, which was held at U.S. Army Corps of Engineers property near Ely. Conference attendees rotated among different stations where they could view demonstrations of equipment including hydroseeders, GIS data collectors, chippers, straw blowers, and seed preparation equipment. Next year's conference will be held September 21-23 in Pottawattamie County; hope to see you there!



Prairie On Farms field day of a first year seeding of a prairie strip on an area farm.

In-Field of Dreams: Prairie Strips Will Come

Ashley Kittle, Prairie On Farms Coordinator

- ashley.kittle@uni.edu

Year One: 2015

This has been a successful first year for the Prairie on Farms project. The Prairie on Farms team consisting of Ashley Kittle, Dave Williams, Greg Houseal and Staci Mueller worked together to:

- promote awareness and education of the importance of prairie for a number of conservation efforts,
- plant a little over 23 acres of diverse prairie at six locations in the Middle Cedar Watershed on commercial farms,
- be a state wide resource for planting and managing prairie in Iowa, and
- provide six workshops and training opportunities for landowners, farm managers and technical service providers

To say the least – we were busy!

Year Two: 2016

This winter we plan to launch an online seed mix calculator developed by Dave Williams. This will serve as a valuable, easy to use, tool for those wishing to plant prairie. We will also facilitate a working group meeting of technical service providers and those involved with prairie-related conservation practices. For 2016 we anticipate developing an informational step by step brochure series on proper techniques to plan, plant and manage prairie on commercial farms. We will continue to provide demonstration workshops, as well as continue to plant diverse examples of quality prairie plantings



on commercial farms. Why is this important? The Prairie on Farms project began in response to increasing interest and concern for soil and water conservation, wildlife habitat and for pollinator recovery efforts. We work to plant in-field prairie strips that lie roughly on the contour (while fitting in with farming operations). Prairie strips can stop erosion, reduce nutrient loss, improve soil quality and support monarch butterflies and other wildlife. If you would like more information about the project, or to be added to the future workshop list, or to learn more about opportunities to plant prairie on your farm please contact Ashley Kittle at ashley.kittle@uni.edu or call 319.273.3828.



Putting TPC expertise to work on Monarch and Pollinator Conservation

Laura Jackson, Director - laura.jackson@uni.edu

On November 3rd, Iowa's August hatch of monarch butterflies began arriving at their overwintering grounds in Mexico. As caterpillars they would have escaped several kinds of predators and diseases, while gorging on the milkweeds of Iowa's roadsides, fields, gardens, pastures and prairies. As adults, they fattened up on late fall flowers along their journey south, no doubt dodging cars and other hazards as they flew (roughly 50% of monarchs tagged from our region make it to their ultimate destination). Now they will rest in the fir trees, consuming the stored sunlight of September days, until they journey north again in March to mate and lay eggs in Texas. Texas sunshine converted to milkweed leaves will greet us in the form of hungry, weary butterflies in mid-May. Will there be enough for them to eat when they arrive? And will there be any milkweed on which to lay their eggs?

Monarchs and other native pollinators such as wild bees, increasingly depend on public lands. The President's Office of Science and Technology Policy has organized a summit of state transportation leaders in Washington DC December 3-4 to advance both regional and in-state efforts to expand and improve pollinator habitat on transportation rights of way, and to identify opportunities to enhance State and local pollinator habitat restoration and maintenance efforts.

The Summit responds to the Presidential Memorandum and subsequent interagency Strategy on Protecting the Health of Honey Bees and Other Pollinators. These documents recognize a critical issue: pollinator populations are struggling nationwide. Our Nation's transportation assets and the people who manage them can play a vital role in the effort to restore and sustain the health of pollinator species and the economic value they provide. The Summit will bring Federal and State leadership together to advance both regional and in-state efforts to expand and improve pollinator habitat on transportation assets, and to identify opportunities to enhance State and local pollinator habitat restoration and maintenance efforts.

I will be participating in the Summit, representing the Tallgrass Prairie Center and our partners at Monarch Joint Venture. We were asked to summarize the costs and benefits of Integrated Roadside Vegetation Management. It is impossible to arrive at a hard number for the costs of a state-wide IRVM approach, much less the many tangible and intangible benefits. However, our Center's long association with county roadside managers and connections with other state programs puts us in a good position to be helpful to transportation leaders nationwide. There are many common principles we

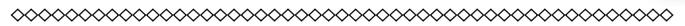
can share about reduced mowing, reduced blanket spraying, adoption of locally adapted, native seed mixes, and crucial communication with the public and neighbors.



Paddy Woodworth, Irish Author Visits UNI

Staci Mueller, Outreach Coordinator - staci.mueller@uni.edu

Irish journalist and writer Paddy Woodworth spoke at the Center for Energy and Environmental Education on the UNI campus on November 5th. The author of *Our Once and Future Planet*, Woodworth discussed ecological restoration as a key conservation strategy in the face of mounting environmental degradation and climate change. Sponsors for the event include The Tallgrass Prairie Center, Friends of the Tallgrass Prairie Center, UNI Office of Sustainability, and Office of the Provost and Executive Vice President for Academic Affairs.



2015 Iowa Prairie Conference: Working Prairies

Daryl Smith, Emeritus - daryl.smith@uni.edu

This biennial gathering of "prairie people" at the University of Northern Iowa July 16-18 was an unequivocal success. For me, it was one of the milestones of my 45 years of prairie work. The ambience was initiated the previous day by the field work-day at Cedar Hills Sand Prairie, organized by The Nature Conservancy, the Iowa Natural Heritage Association and other conservation organizations, as more than seventy committed, hard-working volunteers treated or removed invasive species.

The conference involving more than 215 participants began with a stimulating welcome by Jim Wohlpart, UNI Provost, followed by enlightening keynote presentations by Doug Ladd, "What is Prairie," and Lisa Schulte-Moore, "Tweak, Adapt, Transform: Harnessing the Power of Prairie for Agriculture." Doug provided a captivating, comprehensive overview of prairie and Lisa very skillfully and compellingly addressed the theme of working prairies. The symposia were remarkable. The "40+ years of prairie preservation and restoration, symposium" overflowed with information provided by both present and past leaders in the field. For me, it was filled with both nostalgia and promise for the future. Battle scarred veterans of the roadsides provided a historical perspective of Integrated Roadside Vegetation Management along with insights as to how they deal with this aspect of working prairies. The symposium, "Writing the Tallgrass Prairie," inaugurated another realm of prairie studies and introduced us to other prairie enthusiasts. Sixteen submitted papers, oral and poster, updated us on the work done by individuals across the state and stimulated discussion during the breaks. I was touched and overwhelmed by the informal gathering on Thursday evening to honor my pending retirement. UNI President Ruud came by the second day to greet the group and discussed the "prairie patch" near his residence on campus. One of the benefits of prairie gatherings is the friends and acquaintances one makes. Bruce Stiles was a well-deserving recipient of the Prairie Advocate Award for his long-standing contributions to prairies in Iowa. I have always maintained that prairie enthusiasts are "a touch above the crowd."

The field trip day on Saturday was a bit hot, but many braved the heat to botanize and enjoy visits to Cedar Hills Sand Prairie and Cedar Bend Savanna, the Prairie Power Project Research Plots and Bearbower Prairie or Rowley Fen and Quigley-Slattery Heritage Prairie.

There are many behind the scenes activities that make a great conference. The success of the 2016 Conference would not have been possible without the dedicated efforts of the staff and students of the Tallgrass Prairie Center, the UNI Conference Services, friends, volunteers, Maria Urice, field trip leaders, exhibitors, participants, presenters, the Iowa Natural Heritage Foundation, the Iowa Chapter of The Nature Conservancy and the support and sponsorship of the Living Roadway Trust Fund, the Iowa Prairie Network, Diversity Farms, the Truax Company, Iowa Native Plant Society, Shooting Star, the Leopold Center, the Iowa Energy Center and the University of Northern Iowa.

Most of the presentations were recorded and may be viewed via the Tallgrass Prairie Center website along with photos and a summary of the conference (www.tallgrassprairiecenter.org)



Controlling Invasive Cattails by Fire, Herbicide, and Mowing

Kenneth Elgersma, Assistant Professor, UNI

- kenneth.elgersma@uni.edu

Cattails are a common sight in roadside ditches and wetlands throughout the Midwest and an icon for healthy wetlands. While healthy native wetlands indeed often contain cattails, the presence of these plants often signals a wetland in trouble. This is because most cattails seen throughout the Midwest are not native, but rather are an invasive species from Europe (*Typha angustifolia*) or a hybrid between the native and non-native species (*Typha X glauca*) that crowds out the native vegetation. Roadside ditches are a major pathway for the spread of these invasives, but limiting the growth and spread of invasive cattails in ditches and in wetlands is a difficult task with varied levels of success. Common control techniques include using blanket herbicide spraying, fire, and mowing, as well



Cattails invading an artificial wetland in Michigan

as combinations of these three, but little guidance is available on what techniques work best.

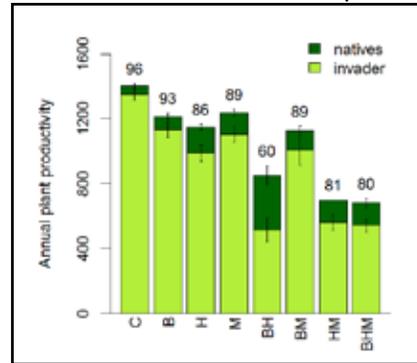
My colleagues and I have been working on a sophisticated computer simulation model to determine which of these techniques work best under various conditions.

We have found that the technique that works best depends on how much nutrient pollution the ditch or wetland receives. In pristine wetlands with little nutrient pollution, intensive treatments like blanketing the vegetation in herbicide doesn't actually help because it hurts the native vegetation just as much as the invading cattails. However, most ditches and wetlands in the Midwest receive a lot of nutrient inputs from agricultural runoff and other sources, and in these cases intensive interventions are warranted. We found that in areas with very high-nitrogen inputs, the best strategy to control invasion was a combination of mid-season herbicide and

late-season burning, applied for several years in succession. This was a nice finding because this combination of techniques is often recommended and used to control cattails, though these recommendations are based primarily on logistical concerns rather than efficacy. Our results show that this approach is also optimal for combating cattails in areas with large amounts of nutrient pollution. We also found that combining herbicide with mowing or combining all three techniques reduced cattail biomass nearly as well, but with greater detriment to the native plant community, again showing that the commonly-recommended approach is indeed the most successful one.

In summary, we've found that when nitrogen pollution is not an issue, cattail invasions can be combatted with a light-touch approach using targeted short-term treatments.

Areas like roadside ditches and heavily-polluted wetlands require a more heavy-duty approach, with multi-year treatments of herbicide and fire. We are now testing our model predictions about how nitrogen pollution affects cattail invasions with a series of 100 artificial wetlands constructed in locations in upper and lower Michigan; stay tuned for results from that study in a few more years.



Annual net primary productivity of native plants and invasive cattails after three years of simulated burning (B), herbicide (H), mowing (M), no management (control; C), or combinations of these techniques. Numbers above each bar represent the percentage of total plant productivity that comes from the invasive cattail. Simulated wetlands received 30 g N · m⁻² · y⁻¹.



Iowa IRVM Story Map Project

Eric Giddens, Prairie Energy Program Manager
- eric.giddens@uni.edu

The Tallgrass Prairie Center and UNI's GeoInformatics Training, Research, Education, and Extension (GeoTREE) Center are joining hands to create an online "story map" that will showcase outstanding native roadside plantings throughout the state of Iowa. This project is being funded by the Living Roadway Trust Fund, and will be implemented over the coming year.

Our story map will showcase photographs and brief descriptions of beautiful roadside plantings across the state. We are currently requesting county roadside officials that participate in the IRVM program to submit any photographs that they already have with the location (the road that it's on and the cross roads that it falls inbetween will suffice) and a brief description (prominent species in the photo, something historically interesting about the site, interest-

See 'Story Map' page 5



Figures 1 (left) Williams new sand mound prairie planting late April 2014 immediately after transplanting. Figure 2. (right) in year two May 2015.

A Sand Mound Prairie Attracts Butterflies... and Admirers

Dave Williams, Research and Restoration
- dave.williams@uni.edu

Imagine something so interesting in your yard that complete strangers are compelled to stop and check it out, then do something similar in their own yards. ‘Stranger-stops’ are a regular occurrence at our house since I installed a sand mound prairie in my front yard. I’d like to take credit, but I didn’t invent this novel form of landscaping. The first time I experienced a sand mound prairie plot was in the early 1990s in Mason City. At that time, I worked for the Cerro Gordo County Conservation Board. My co-worker Kurt Baker, purchased a full truck load of sand and had it dumped in his front yard, then seeded it with prairie. His project attracted both supporter and scoffers, until it bloomed and folks marveled at what a good idea it was.

My next encounter with a sand mound prairie wasn’t until many years later at the Tallgrass Prairie Center (TPC). In an innovative experiment in 2007, Greg Houseal arranged for six dump-truck loads of river sand to be deposited in the front yard of the TPC. He and former UNI graduate student Justin Huisman planted hundreds of native prairie plants into the sand, including many unusual species that prairie enthusiasts seldom experience. The TPC sand mound project has developed into a beautiful dry prairie plant community providing center visitors a unique flora and fauna display of what is possible in a pile of sand.

A sand mound prairie of any size has many advantages over traditional landscape garden design, not the least of which is that very little weeding is required. There are virtually no weed seeds in sand- and weeds that do appear can be easily pulled. Because prairie plants are adapted to dry, sandy soils, they don’t grow as high as other wetter species either; a sand mound prairie only reaches an aesthetically manageable waist-high height- perfect for residential yards (Table 1). In addition, these dry loving prairie plants are long-lived perennials, drought tolerant, and are excellent pollinator sources for native insects, including the Monarch butterfly.

A sand mound prairie is easy to install in a few simple steps.

1. Choose a full sunlight spot in the yard.
2. Purchase sand from your local quarry. The project is a whole lot easier if they can deliver and dump the sand on your planting site but if you have to haul it yourself, get a pickup or trailer load and use a wheelbarrow to cart sand to where it needs to go. Leave the turfgrass sod in place - it’s not necessary to kill the sod because three feet (or more) of sand piled over the top will kill the turfgrass for you.
3. Pile the sand on the planting site as high as you can get it when unloading. Then use a garden rake to sculpt the pile. Consider dry laying landscaping pavers around the base of the pile to keep sand from sloughing (see photo).

4. Use live plants coupled with a diverse mix of species. Live prairie plants can be purchased from a number of Iowa vendors, including Prairie Moon Nursery and Ion Exchange (www.prairiemoon.com, www.ionxchange.com). At least 1/3 of the plants should be grasses (Table 1).

5. Space the plants about 1’ apart and lightly cover the bare sand with grass clippings after installation (Figure 1). Grass clippings will hold the sand in place until plants become established. The base of the sand pile will remain wet for many days after a rainfall so if you use swamp milkweed be sure to plant this species at the base of the pile.

6. Water every 3-4 days in the first growing season if rainfall is infrequent. After the first year, no watering is needed. Don’t fertilize; these plants are adapted to nutrient poor soils and roots will quickly find their way into the nutrient rich soil beneath. By the end of the second growing season, you will not be able to see the sand because the mound will be completely covered with prairie plants and bloom throughout the summer (Figure 2).

7. Enjoy your sand mound prairie- and all the new friends you’ll make who will wander over to inquire about your sand mound prairie!

Table 1. Recommended species for a sand mound.

Grasses	
Side-oats Grama	Bouteloua curtipendula
Hairy Grama	Bouteloua hirsuta
Junegrass	Koeleria macrantha
Little Bluestem	Schizachyrium scoparium
Rough Dropseed	Sporobolus asper
Prairie Dropseed	Sporobolus heterolepis
Forbs	
Prairie Onion	Allium stellatum
Thimbleweed	Anemone cylindrica
Swamp Milkweed	Asclepias incarnata
Butterfly Milkweed	Asclepias tuberosa
Whorled Milkweed	Asclepias verticillata
Aromatic Aster	Aster oblongifolius
Silky Aster	Aster sericeus
Prairie Coreopsis	Coreopsis palmata
Purple Prairie Clover	Dalea purpurea
Pale Purple Coneflower	Echinacea pallida
Dotted Blazingstar	Liatris punctata
Hoary Puccoon	Lithospermum canescens
Spotted Bee Balm	Monarda punctata
Toothed Evening Primrose	Oenothera serrulata
Marbleseed	Onosmodium molle
Large-flowered Beardtongue	Penstemon grandiflorus
Old-Field Goldenrod	Soildago nemoralis
Prairie Spiderwort	Tradescantia bracteata
Heart-leaved Alexanders	Zizia aptera



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Tallgrass Prairie
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NEWSLETTER

This newsletter is published electronically twice per year. For subscription information or questions, contact the editor: gregory.houseal@uni.edu

*Tallgrass Prairie Center, 2412 W 27th Street
University of Northern Iowa
Cedar Falls, Iowa 50614-0294*

www.tallgrassprairiecenter.org

'Story Map' - continued from page 3

ing geological features, etc.) of each site. These photos should be submitted via email to Eric Giddens at eric.giddens@uni.edu. We are looking for 3 to 5 photos from each county.

During the summer of 2016, the Tallgrass Prairie Center and the GeoTREE Center will work together to create the story map. Then, in the fall of 2016, the Tallgrass Prairie Center will work to have the story map posted on county government websites, pertinent state agency websites, and conservation and tourism related non-profit organization websites.

The Iowa IRVM story map that we produce will be a beautiful product that will highlight the wonderful and important work that our county roadside programs do across the state. Please feel free to email Eric Giddens at eric.giddens@uni.edu if you would like any additional information or have any questions regarding this project. For more information on story maps and to view example story maps, visit this website: <http://story.maps.arcgis.com/home/index.html>.



New Publications Available from the Tallgrass Prairie Center

Greg Houseal, Natural Selections Program Manager
-gregory.houseal@uni.edu

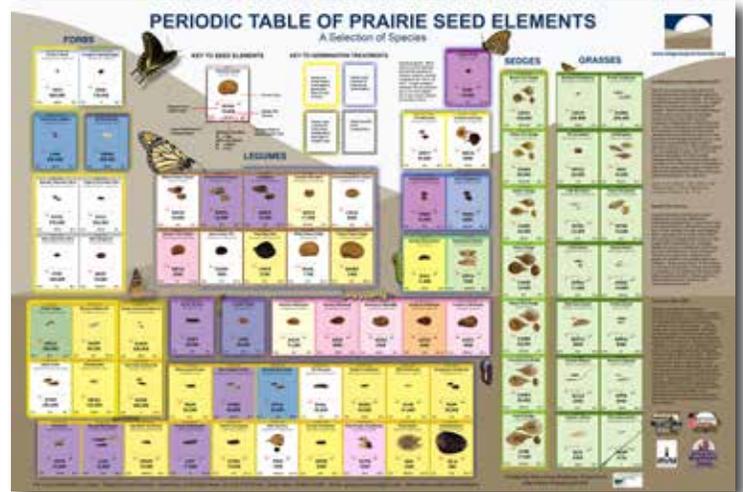
The Tallgrass Prairie Center has two new publications available, courtesy of funding from the Living Roadway Trust Fund. A *Periodic Table of Prairie Seed Elements* organizes 76 commonly planted species by seed size within family group in a visually-driven information-packed format. The table includes 55 forb (including 10 legume species), 7 sedge, and 14 grass species. Each 'element' includes a macro photograph of the seed with metric scale, seed count per ounce, moisture gradient, coefficient of conservatism (CC) for Iowa, and suggested seeding rate for a diverse prairie planting. Plant family, floral color, and seed germination treatments are also indicated. The table allows prairie restorationist and enthusiast to quickly and easily familiarize themselves with native seeds and provides a handy reference guide for the office, shop, or classroom.

A *Prairie Restoration Series* of ten technical guides have also been produced. The series highlights the entire gamut of prairie restoration, including: 1) *Seed Collecting*, 2) *Drying, Cleaning, and Storing Prairie Seed*, 3) *Propagating Native Plants*, 4) *Recognizing and Appreciating Tallgrass Prairie Remnants*, 5) *Native Seed Source and Quality*, 6) *Designing Seed Mixes*, 7) *Site Preparation*, 8) *Seeding*, 9) *Initial Post Seeding and Early Reconstruction Management*, and 10) *Evaluating Stand Establishment*. These technical guides



are adapted from chapters in the *Tallgrass Prairie Center Guide to Prairie Restoration in the Upper Midwest*.

Both publications will be distributed to IRVM Roadside programs in counties throughout Iowa. The publications are free to the public, and will be made available at the Center as well as at various events around the state. Email gregory.houseal@uni.edu to make other arrangements for copies to be sent to your organization.



Student Profiles

Jordan Young, Graduate Student, Biology



Jordan is a graduate student in the biology department working at the *Cedar River Ecological Research Site*. She is researching the effects of biofuel production on carbon cycling, specifically investigating the effects of species diversity and soil type on soil respiration and litter decomposition. Jordan has just completed her data collection and will defend her thesis this spring. With a passion for natural resource management and conservation, she plans to pursue a career working as a wildlife biologist for the U.S. Fish and Wildlife Service upon graduation.

Wynton Karanja, Global Health: Health Disparities, Sophomore at UNI



Wynton is a new lab/field assistant at the Tallgrass Prairie Center. He is very interested in sustainability, and has been involved with Green Project UNI - The Panther Plot, which is an interdisciplinary student organization focused on local food and the creation of an on-campus student vegetable garden. "I've had valuable experiences working in the outdoors with plants. I believe working at the Tallgrass Prairie Center will enrich my knowledge of managing prairie plants and diversify my experiences". Wynton plans to work in the public health sector after completion of his studies.