Blue Mounds Area Project
Promoting Ecological Restoration and Stewardship of Native Habitats

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Insects and *Wulfenia bullii*

Marci Hess, Jim Hess, and John van der Linden

In October 2016, a 7-acre parcel was identified with 500-700 *Wulfenia bullii* (Figure 1; a.k.a. kitten's-tails) plants on it. The 7 acres are bordered with oaks and the soil is sandy. It is degraded with smooth brome dominating the herbaceous community. We learned on a tour of this site that no management had been conducted on this area (M. Martin, pers. comm.). The 7 acres are located in Green County, Wisconsin in Mt. Pleasant township.

Wulfenia bullii (Scrophulariaceae) is categorized as a threatened species in Wisconsin, with a coefficient of conservation of 9. It is at risk for extinction because of its restricted range. The plant stands 8" to 16" tall and blooms from April to July with fruiting from July to August. The plant is found in full to partial sun in dry prairies, woodland openings, bluff edges, and oak savannas preferring sandy, gravelly soil (Wisflora database, Wisconsin DNR website). By July, the seeds are formed and the plant is senescing.


Photo by Marci Hess

Figure 1. *Wulfenia bullii*

Little information exists about insect associates of *W. bullii*. A search of Google Scholar resulted in one study regarding pollinators of this plant (McKone, Mark J. et al., 1995). Because this site had no history of prescribed fire, herbicide use, or other management techniques, it was deemed a good candidate for this baseline study.

Goals and Processes

The primary goals of this project were to identify insects and other invertebrates using *W. bullii* and to discover the nature of these animals' interactions with the plant. The site was surveyed once a week between February and September; observations were conducted during the day.

Protocols were drafted prior to beginning the research. Only the rearing protocol was altered, to allow for *in situ* rearing of hemipteran nymphs in specially constructed bags. Except for those we bagged, all larvae, nymphs, pupae, and eggs were collected for rearing in numbered collection vials. Rearing bags left in the field had a plastic numbered tag attached to them. Photographs of the insects in the field were taken when possible.

Results

Hemipteras abounded!! Attempts to rear the nymphs were unsuccessful. Many were collected and vouchered along with adults in hopes that identifications can be made.

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Greetings from the Blue Mounds Area Project Board of Directors

Welcome to the first newsletter of 2019. Even if you are a winter lover like me you are probably ready for spring. While this edition has plenty in it to help you get ready for warmer weather it also has a review of our winter Conservation Conversations series, the last of which included our organization's annual report. The rest of this column is a summary of the report I gave at that meeting.

The mainstay service of BMAP is the ecologist position. In his first year with BMAP ecologist Micah Kloppenburg visited 15 of our member's properties and wrote up reports on 565 acres. In addition, the monarch butterfly habitat project that we are partnering in with other area conservation groups went into full swing. Micah provided habitat site improvement recommendations for 30 landowners. The goal of the project funded by the National Fish & Wildlife Foundation is to create 1,650 acres of new or improved monarch habitat in the SW Grasslands & Stream Conservation Area which generally lies south of State Highway 18/151 between Mount Horeb and Dodgeville. BMAP is proud to be just one small component of this landscape conservation effort. Twenty more site "plans" need to be delivered in 2019. If you contact Ecologist@bluemounds.org soon you might still be able to sign up and participate in this pollinator protection project.

As for complimentary community outreach our winter Conservation Conversations series once again had high turnout. Attendees learned about restoring oak savannas, planting prairies, and the importance of wetlands. In the summer season we traveled to New Glarus, Blanchardville and Argyle on Thursday evenings to visit member's properties, hike through their restoration projects and enjoy late summer evening picnic. A special Saturday walk took place at 2016 Bur Oak Award winner Mary Trewartha's Boblink Hill Farm.

In 2018 we also retired our BMP-list and replaced it with the BMAP E-Bulletin which will be sent monthly to provide more timely updates and information to our members. We included everyone we had an email for on the distribution list. If you don't want the E-Bulletin there are instructions in it on how to unsubscribe. If you aren't on the list and want to be, send us an email and ask to be included.

The format change will retain the ability to announce events and workshops but also allows photos and provide more content. Look for pieces about other members, reflections on the Driftless Area and a stewardship calendar to remind you of when key management should occur and other tidbits. We are always looking for suggestions and contributors. If you have something you would like to provide, please contact Micah at Ecologist@bluemounds.org.

Our hardcopy newsletter will continue to be mailed 3 times a year in addition to our website and Facebook. If you miss the discussion feature of the BMP-list sign you might try starting a conversation on our Facebook site.

Marci Hess has been the editor of our newsletter working with Julie Raasch to produce an informative edition 3 times a year. After several years of volunteering, this will be Marci's last BMAP newsletter that she edits. We thank Marci for her passion and dedication helping to pull together a great education tool every 4 months. We have a "help-wanted" sign out for a new editor.

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Ecologist Report

Micah Kloppenburg, BMAP Ecologist

No ecologist report...
Micah Kloppenburg and his wife Carrie welcomed baby Isla to the world in March! Isla was born weighing in at a proper 8lbs 12oz and 21.25 inches. All are doing well. Congrats to Micah and Carrie!

Isla Renae Kloppenburg

Micah and Isla Kloppenburg

Wood-betony and the Art of Preserving Ecological Communities

John A. Raasch

The wood-betony (*Pedicularis canadensis*) plants invading the lightly vegetated sandy ground left behind by construction of a septic drain appear to be opportunists. But this species isn't simply exploiting an opening here and an opening there. Each rosette of feathery green leaves is paving the way for more of its own kind, and more than a few other species as well.

Wood-betony—which is found in dry to mesic prairies, savannas, and forests throughout much of Wisconsin—is a hemiparasite. It contains chlorophyll and can live as an autotroph, like other plants, or it can extract organic carbon, nitrogen, and additional useful chemicals from other plant species. Some hemiparasites are very choosy, relying on one or a few hosts. Others are generalists. Plant taxonomist Martin A. Piehl discovered that wood-betony can tap at least 80 different plant species in 35 families. A random selection of victims you might recognize include *Achillea millefolium*, *Allium cernuum*, *Aster laevis*, *Equisetum arvense*, *Rhus hirta*, *Rudbeckia hirta*, and *Trillium grandiflorum*. Wood-betony does this by means of haustoria that develop along lateral roots and establish connections with the host plant's roots. This occurs very early during seedling development, and water from hosts is likely essential for survival of young wood-betony growing in dry soil—something to keep in mind if you scatter the seeds in your prairie, savanna, or your perennial garden.

What does wood-betony acquire from this relationship? There are the basic products of photosynthesis. There are minerals. There's water. And there are alkaloids. Alkaloids? No one has looked at *P. canadensis*, but chemical analysis of tissue from five other Pedicularis species consistently revealed the presence of alkaloids also found in the host plant's roots. This could be a general feature of the genus and raises interesting ecological questions. Alkaloids exhibit potent biological effects—often deadly—and can protect plants from insects or other herbivores. Can hemiparasites commandeer alkaloids for their own protection? Biologist Lynn Adler demonstrated just this by growing Texas paintbrush (*Castilleja indivisa*), a southern relative of our local Castilleja species, alongside "bitter" and "sweet" varieties of lupine. Texas paintbrush plants parasitizing "bitter" lupines, which contain high levels of alkaloids, were far less prone to insect damage and produced more viable seed. What are the implications for preserving hemiparasitic plant species? For each species, it isn't just a matter of securing a host, but identifying the appropriate host—or combination of hosts—to ensure the plant is prepared to resist the local array of herbivores.

Wood-betony also acquires an indirect benefit from its relationship with host plants. By weakening the competition—by diverting resources—this generalist can suppresses the growth of other plants and open up the canopy for itself and its comrades. Ecologists noticed a tendency for wood-betony to grow alongside relatively shorter populations of certain grasses and forbs, but there was the question of which arrives first, the wood-betony or the shorter competitors. It could simply be soil conditions. But research by Andrew Hedberg and others of Illinois State University clearly showed wood-betony reduces the above-ground growth of plants such as tall goldenrod (*Solidago canadensis*) and big bluestem (*Andropogon gerardii*). Not all species studied were affected, but it is clear wood-betony can shift the balance of power on a patch of prairie sod.

This is where the hemiparasite starts contributing to and building a richer prairie or savanna plant community. By opening the canopy for itself, wood-betony inadvertently opens the canopy for others and promotes biodiversity. The researchers who demonstrated that wood-betony can suppress competition also discovered a positive correlation between wood-betony and species diversity. Three years earlier, Wisconsin DNR researcher Richard Henderson—based on observation and experiment—had suggested that wood-betony is one of several important keystone species that preserve Midwest prairie diversity. Introduction of the seed into a small established planting was followed by a substantial decline of dominant grasses and the appearance of fourteen native forbs. Richard Henderson pointed out that other factors might have contributed, but his call for further study deserves repeating. The right mix of plant species—as far as restoration and conservation are concerned—can set the stage for success or failure.

Photo by Julie Raasch

Wood-betony Flowers

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The Southwest Wisconsin Grasslands Network, SWGN

Cindy Becker

What is the Southwest Wisconsin Grasslands Network (SWGN)? The SWGN is a partnership of non-profit, federal, and state agencies involved in promoting the stewardship and protection of grassland habitat here in southwest WI, specifically, Iowa, Grant, Lafayette, and the western part of Dane County. The partnership is made of 14 organizations and around 25 individuals, give or take. My name is Cindy Becker, the newly hired coordinator of the Network; I am honored to support a collaborative effort built on the commitment and hard work of the conservation community in the area (such as BMAP), and spurred forward by a common idea that community conservation today fosters a better tomorrow.

"When land does well for its owner, and the owner does well by his land; when both end up better by reason of their partnership, we have conservation. When one or the other growers poorer, we do not."

– Aldo Leopold

The mission of the Network is to promote healthy grassland habitat, thriving farming communities, and clean water. How we plan on implementing our mission is through you, the residents and keepers of land here in the area. With 97% of the land in the region in private ownership, it is the private landowner that individually contributes to improving the health and protection of the habitats – idle grasslands, pasture, remnant prairie and savanna – that make up the grassland mosaic here in SW Wisconsin. Landowner participation and involvement is integral to any effort to reverse or stay the alarming trend of environmental issues such as declining grassland bird populations, the loss of prairie habitat, decreasing species diversity, and polluted drinking water. We can do this, folks.

We have three primary projects we will be working on in 2019 – 2020.

Stakeholder Outreach

"Every farmer, willy-nilly, is writing history and painting a new landscape for Wisconsin. The only question is whether he is aware of it, and whether he is critical of the result."

– Aldo Leopold

Through landowner mailings and surveys, focus groups, and culminating in educational programming and Q&A at four libraries in the area, we want to hear from you. If you live in and around the Perry Primrose GBCA and the Barreltown GBCA (see map), in late spring/early summer you will be receiving a survey in the mail with questions that pertain to your views and opinions on farm and land stewardship, voluntary conservation programs, and regional issues such as water quality and grassland bird population declines. Concurrently, we will be bringing together focus groups where we can discuss these issues in more depth. Focus groups will include women-farmer/landowners, recreational landowners, dairy farmers, and diversified small farm owners. This outreach effort will culminate in events at the Mount Horeb Library, New Glarus Library, Dodgeville Library, and the Mineral Point Library. These events will host a film/speaker, share information learned from the surveys and focus group sessions, and involve a Q&A session.

Protecting Prairies and Saving Savannas

"He who owns a veteran bur oak owns more than a tree. He owns a historical library, and a reserved seat in the theater of evolution. To the discerning eye, his farm is labeled with the badge and symbol of the prairie war."

– Aldo Leopold

Protecting Prairies and Saving Savannas is a project to cultivate interest in the protection and restoration of prairie and savanna remnants in the region. Over the next few years, landowners whose lands were surveyed for prairie and savanna remnants during a project conducted for the WI DNR by Applied Ecological Services in 2010 – 2011 will be contacted and offered a one-on-one site visit. Our goal is simple – to connect landowners whose lands harbor prairie and savanna remnants with the expertise and access to voluntary stewardship programs available to restore and protect these important habitats. We will be focusing this first year in the Barreltown GBCA and Perry Primrose GBCA, integrating this outreach with the stakeholder outreach I mention above, and we are also reaching out to landowners in and around Mineral Point.

Also, we'll be hosting a Prairie and Savanna Restoration Workshop this summer/fall season, bringing together partners who provide technical and financial assistance for restoration and stewardship efforts, practitioners who specialize in these services, and landowners with their own experiences to share.

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Wetland Talk with Pat Trochlell

Denise Thornton

Photo by Julie Raasch

Pat Trochlell, Wisconsin Master Naturalist instructor and retired WDNR Wetlands Ecologist

Patricia Trochlell, Wisconsin Master Naturalist instructor and retired WDNR Wetlands Ecologist, kicked off the 2019 BMAP Conservation Conversation series by sharing her 37 years of experience in wetlands restoration. Wetlands are perhaps the most misunderstood and undervalued ecosystem in the state and one of the most degraded. In some southern Wisconsin counties, the amount of wetland loss is over 75%.

This is a huge loss indeed because most of Wisconsin's wildlife depends on wetlands at some point in their lives. By removing sediments and excess nutrients, wetlands help keep our water, including drinking water, clean, and play a crucial role in flood protection as they capture and store water from heavy rains and snowmelt.

Trochlell defined a wetland based on three qualities.

1. Hydrology: as an area where water is at, near or above ground level.
2. Soils: special soils that form in water. "Organic soils are black, but the minerals in wetland turn its soil gray. There's an old saying 'Black over gray - developer, go away.'"
3. Vegetation: Wetland plants have adapted to wet conditions and have found alternative ways to get oxygen to their roots.

Wetlands come in many sizes and varieties. There are 35 different wetland plant communities recognized by the Wisconsin DNR in the natural heritage program.

Trochlell described the familiar deep wetland marsh as having standing water year-round with vegetation growing out of it and with floating plants and plant parts.

Hardwood swamps are filled with trees similar to those growing on higher ground like maples, oak and ash, but they are species adapted to wet conditions such as black ash, swamp white oak and silver maple.

Not all wetlands have standing water all year long, Trochlell noted, such as the southern sedge meadow, which has no standing water in the middle of the growing season.

"In our area, these sedge meadow wetlands have been growing in the valleys along streams where ground water is seeping or discharging," said Trochlell. "But most of them have been impacted by agriculture."

Another important wetland is the ephemeral pond. "This is a wetland you can easily miss, especially in the height of the growing season," said Trochlell. "It is a small area, maybe concave in shape with no vegetation. "These are really critical for invertebrates and amphibians."

Agriculture has long been at odds with wetlands. Many areas have been drained by laying perforated tiles underground to drain water away so the area can be cultivated and planted.

The other big enemy is invasive species. "Invasive species management is needed in all wetlands," Trochlell said. "Almost all of our wetland areas have a serious invasive weed problem, and reed canary grass is the biggest. If you have a wetland and are wondering what is the biggest bang for the buck, it may well be invasive removal. Reed canary grass burns really well even with standing water."

Another technique many wetland restorations need is removing sediment from the surrounding area that accumulated on top of native wetland soils.

"This is really important for the Driftless Area," she said. European settlers farming practices on hills and slopes caused rich topsoil to wash down into nearby wetlands."

Before any wetland restoration is attempted, Trochlell emphasized that a thorough study must be made of the area. Survey the site and look for wetland indicators:

1. Find out everything that you can about your site using information from the internet. Trochlell suggested checking out:

   The Regional Supplement to the Corp of Engineers Wetland Delineation Manual, available online. It has wonderful photos showing what wetlands look like.

   The Wisconsin Wetlands Association Tools for Communities is another good site.

2. Do a comprehensive field study. Determine the hydrology with drilling. Use a color chart to ID soil types. And, use the Meander Assessment Monitoring method available on the DNR website to learn what is growing. Trochlell suggested reading 'Wildflowers of Wisconsin and the Great Lakes Region' and 'Sedges and Rushes of Minnesota'.

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It started simply, as these things often do, with a Christmas gift of 900 square feet of prairie from a son to a father. “Just tell me where,” said the son. But, before the first seed could touch the soil the 900 square feet was enlarged to 10 acres, which was soon followed by 10 more acres. And so began the transition of the crop- and pasture land on Jim “MacD” and Betty MacDonald’s farm near Blanchardville back to prairie, savanna and wetland.

Photo by Julie Raasch

Jim “MacD” MacDonald and Carroll Schaal

Photo by Julie Raasch

About 35 acres have been converted to prairie.

Mother and Son Win 2019 Bur Oak Award

Michael Anderson, BMAP board member

Jim “MacD” and Betty MacDonald

For their effort, long-term commitment, and great success the mother and son team of Betty and MacD are winners of this year’s Bur Oak Award for Outstanding Land Stewardship. MacD is also a BMAP board member.

The Bur Oak Award recognizes BMAP members making an outstanding contribution towards protecting or restoring native biodiversity. The bur oak tree was chosen as the award’s namesake because it represents the region’s dominant native plant community (oak savanna), and because it symbolizes longevity and resilience in the face of adversity.

James and Betty MacDonald (MacD’s parents) purchased the farm in the 1980s. To the farm’s seller, it was marginal farm land. To the MacDonald family, it was a place to be outside observing and enjoying nature. At least that was the case before being bitten by the “prairie bug.”

All 20 acres were planted with only three prairie grasses - big bluestem, Indian and side oats - and four short-lived forbs, a common practice in the early 1990s. Unsurprisingly, a stand of tall, dense grass resulted, hardly an accurate replication of a prairie. That’s where MacD enters the picture with his goal of returning the former richness and diversity of York Prairie to the farm, which is embedded within the historic boundary of York Prairie.

To achieve his goal, MacD uses fire and precisely timed herbicide application to eliminate the tall grasses. Next, he hand plants the prepared area with seeds he’s collected from the remaining bits and pieces of the original York Prairie. The seed mix is very diverse, typically 120-140 species of forbs, sedges, short prairie grasses and prairie shrubs. He’s been converting about three to four acres per year, and has converted about 35 acres so far, with more acres planned.

MacD has been using similar techniques to eliminate reed canary grass along a spring-fed stream, wetland and pond shoreline. Seeding has not been necessary in these areas since the native vegetation has recovered on its own.

If you attended BMAP’s summer excursion to the MacDonald farm, I’m sure you’ll agree the results of MacD’s efforts are dramatic. Walking through the prairie we saw tall grasses with nary a forb on one side of the path; the “before”’ condition. On the other side was an abundance of colors, heights, textures and motion; the reborn York Prairie.

Thank you MacD and Betty for sharing your story and your land with BMAP. Congratulations on winning the Bur Oak Award.

2019 Bur Oak Award
Created by artist Charles Ramseyer

Photo by Julie Raasch

Prairie Restoration

Denise Thornton

More and more, prairie plantings are being established everywhere from back yards to big former farm fields, but there is no such thing as a one-size-fits-all prairie plan, Neil Diboll, president of Prairie Nursery in Westfield, told the audience at the last of the Blue Mounds Area Project 2019 Conservation Conversations recently.

We are still learning how to restore prairie, and the methods have changed a lot over time, said Diboll who has over 40 years of experience in prairie restoration.

The biggest problem in prairie plantings today - too much grass.

"Our knowledge of prairies continues to expand," he says. "Early explorers in this area talked about the flower meadows of Southwestern Wisconsin. Covered in flowers! Now you go to the remnants, and they are big blue stem, indian grass and switch grass - tall grasses".

That is because of the grazing animals attracted to prairie. Bison and elk were eating those grasses. "They don't eat flowers much," Diboll noted.

Early prairie restorations included a lot of grass seed, which quickly came to dominate attempts to replant prairie. Only a few flowers can compete with tall grass because they are tall enough to get light and have complimentary root systems with deep taproots like compass plant, prairie dock, white and purple prairie clovers, wild quinine, yellow coneflowers and pale purple coneflowers.

"When I first started growing prairie, I put all the tall grasses and short grasses into my seed mixes," said Diboll. "But it would eventually turn into a tallgrass prairie.

"Without grazing or burning, which removes all that thatch, allowing early bloomers to come up - your floral diversity decreases dramatically over time," said Diboll.

He came up with a radical idea in 1984 to plant a shortgrass prairie. "This was not done. It was heresy. But it worked. You need to optimize your flower-to-grass ratio."

To make sure those flowers will grow well, Diboll advises planting in the fall or as a frost seeding in the winter. Choose a time when there is half a foot or less - even no snow on the ground. The seeds will be buried by the frost heave of the soil when the soil freezes at night and thaws in the day. The soil opens and closes, and the seeds find their place beneath the surface.

Some plants, like wood betony, can reduce the tallgrass growing near them because it is hemi-parasitic on tallgrass. Wood betony cannot be started by itself in flats because it has to germinate with other seeds.

Diboll adds annual rye as a nurse crop when planting a prairie. It is toxic to certain weeds like canada thistle.

On the subject of killing unwanted plants, Diboll's thinking about glyphosate, the weed killer most commonly prepared as Round Up, has really changed over time.

"I do an environmental impact statement for every site preparation plan I do," he said. "I used to be totally organic in killing weeds. I went out with a tractor every month and ripped up the vegetation. But how much diesel fuel did I use? All of a sudden I had erosion and water pollution."

Some people smother weeds with a layer of black plastic for a growing season. Diboll used it on a three-acre planting in a watershed.

"But what is the environmental impact statement on three acres of black plastic?" he asked. "It's a petroleum product and nobody recycles it. Crazy."

"Now I consider glyphosate a necessary evil to achieve a greater good," Diboll said. "However, I only use it to prepare a field and then never again. You will never see it again in that field. That's different from the continual use on food crops with conventional agricultural practices."

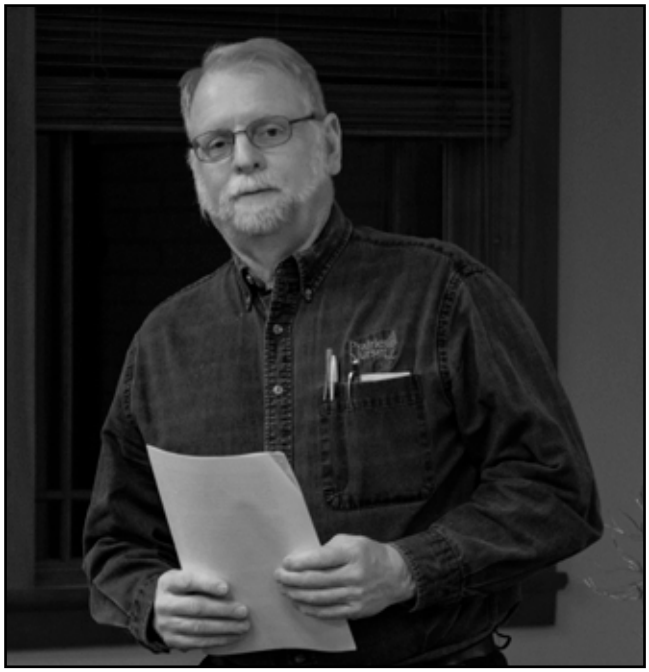

Photo by Julie Raasch

Neil Diboll, president of Prairie Nursery in Westfield

For every site, Diboll notes, you need to evaluate: How much energy, how much petro-chemicals, what are the waste products, how much resources are you using, what are the potential side effects.

Sometimes the answer may be glyphosate.

"The problem with Roundup is that it is prepared with a surfactant," said Diboll. "You can't use Roundup near an aquatic system, it's the

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INSECTS *from page 1*

A specimen of the leafhopper, *Attenuipyga platyrhynchus* (Cicadellidae; Figure 2), was found on 7 Jul 2017.

Photo by Marci Hess

Figure 2. *Attenuipyga platyrhynchus*

A total of 277 specimens – both plant and invertebrate - were documented.

The best opportunity to observe insects actually using the leaves as host plants arose from three species of caterpillars that were photographed. One species was found on three occasions with documented herbivory of the leaves.

The first larva (unidentified; Figure 3) was collected on 18 February 2017 for rearing, which was unsuccessful. A possible identification was received from a Caterpillar Identification of North America Facebook Page user, who suggested it as either a *Spodoptera* sp. or *Noctua pronuba* (Kesting-Hardy 2017).

Photo by Marci Hess

Figure 3. Unidentified caterpillar

An encounter with another caterpillar occurred on 05 May 2017. Because it was similar in appearance to the first, no identification has been ascertained. I suspect this same type of caterpillar was also encountered on 21 June and on 19 August.

5 May 2017

A second unidentified species of caterpillar (Figure 4) was first observed and collected on 5 May 2017. An additional specimen, which we think is the same species, was photographed on 21 June.

Photo by Marci Hess

Figure 4. Unidentified caterpillar

31 July 2017

On 31 July, a third species of caterpillar, 3mm long (Figure 5), was found sharing a leaf with another species of leafhopper, *Phlegyas abbreviatus* (Cicadellidae). This caterpillar was not noticed when the leafhopper was first collected.

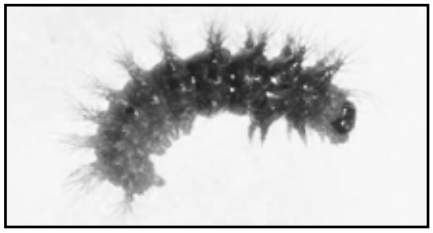

Photo by Marci Hess

Figure 5. Unidentified caterpillar

29 May 2017

On 29 May 2017, this silken webbing (Figure 6) was observed. While the Lepidoptera larvae were curling the edges of the leaves around them, this appeared toward the middle of a leaf that never curled.

Leaf and Stem Markings

Plant parts were collected and pressed as well as photographed. There were some interesting patterns, possibly herbivory, but which could also be due to mechanical or microbial damage. Whatever caused these changes, similar patterns were observed on multiple leaves. These consisted of an assortment of squiggled lines. Some completely cut through the leaf while others exhibited varying stages and depths.

In February, dried seed heads from the previous growing season were also examined and found to have markings that would indicate herbivory or possible exit holes from unknown insects. Similar, fresh markings were also noted later in May. They were confined to the seedpods and appeared to be the home of some insect.

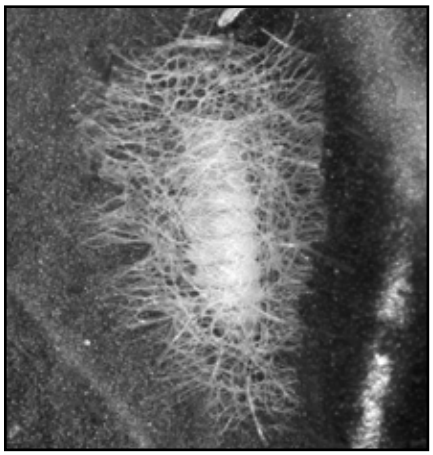

Photo by Marci Hess

Figure 6. Silken webbing around a caterpillar

A number of stem scars were also documented. These were noted in April and May.

Discussion

This study did not result in definitive answers regarding which insects are specific to *W. bullii* and how they use the plant. Further research may be appropriate in regard to some insects and insect signs observed in association with the plant. Attempts to rear caterpillars feeding on kitten's-tails were unsuccessful, leaving their identifications a mystery. Future efforts should attempt to improve on rearing adults from such larvae. Obtaining species-level identifications would be helpful in determining whether the larvae are polyphagous or oligophagous.

Although non-arthropod factors (e.g., disease or mechanical damage) may be responsible in some cases, the finding of distorted leaves and inflorescences, a gall-like stem swelling, and obvious feeding damage to *W. bullii* fruits suggests the presence of herbivorous insects that were not directly observed during this study but which could be targeted by future workers. Numerous leafhoppers and a few spittlebugs

(Cercopidae) were found using the plant and sucking its juices, but it is unknown if these plants were specific hosts for them.

Most leafhoppers were not observed feeding on the plant. As the summer progressed, the overgrowth of other the plants above and around the kitten's-tails made subtle observation challenging. Once the non-target plants were moved to view the kitten's-tails, most activity stopped. A chrysomelid beetle larva was the only one undaunted by my presence.

One particular aphid, *Therioaphis trifolii* (Aphididae), was observed throughout the spring and summer. The host plant for this aphid is clover, which was sprinkled around the research area. That these aphids were found on the *W. bullii* leaves probably means that they crawled or fell off their host plant. In researching this, only one aphid species is known to use *W. bullii* as a host plant; that is *Myzus ornatus* (Aphids of the World website).

A few other interesting finds include an unidentified rust on a *W. bullii* leaf, several snails, and a variety of flower/hover fly (Syrphidae) larvae and pupae. Many syrphid larvae are predaceous on aphids (Rotheray and Gilbert 1989) and so their presence on *W. bullii* at this site may indicate sizable populations of aphids nearby.

Many of the photos taken were placed on BugGuide in order to make these more public and allow for expert identifications. A listing of all observations and specimens with correlating info and BugGuide reference numbers can be found in the Appendix to this report. A complete version of this report may be found on the Driftless Prairies website: http://driftlessprairies.org/insects-and-wulfenia-bullii

PRAIRIE *from page 7*

surfactant that causes problems with amphibians. I'm not saying it causes no problems, but there are ways to massage it so it causes fewer problems. Rodeo is a glyphosate product designed for use near aquatic systems."

"You have to know who the enemy is and have a battle plan when you are preparing a site," said Diboll, "because it's a war out there - and if you don't do it right, you are going to lose. Brown is beautiful. You want everything dead. Take no prisoners. But remember, this only works on level ground."

Diboll explained his protocol.

My glyphosate use: I used 3 applications. When the weed get 12" tall in the spring - spray. Wait 2 months and spray. Wait two more months and spray. So it's usually around early June, mid July and early September.

Don't spray as soon as you see green. That glyphosate is completely wasted when you burn the tops off. If you want to kill quack grass, which is one of our biggest problems, it has to be at the 4-leaf stage where there are four fully formed leaves coming off that stem. Wait till then, and you'll whack it.

There will be a small percentage of survivors because of the rhizomes that will re-sprout. They will come back in July. Spray again in July.

If you have a really nasty old field with buckthorn, brome grass and some canada thistle, let everything come back. Mid September when plants are 12" -spray. You're knocking out fresh new growth. It's not old, gnarly growth that has been there since May. It's fresh, and herbicide goes right into it.

Use a surfactant. Use a water conditioner if you have a soil that is high in magnesium or calcium. Otherwise the calcium and magnesium ions will lock up your herbicide so it seems much less concentrated. Weeds like crown vetch need a broadleaf herbicide.

Dibol's final advice was, "Get your plants from a reputable nursery. Box stores work with the lowest bidder, which is generally a plant factory without much concern for the health of their workers or the environment. Know where your plants are coming from. Learn from your mistakes, and keep good records."

Acknowledgements

Many thanks to Jim Hess for assisting on every field trip, for collecting insects, including the quick leafhoppers, the GPS data, and detailing the other plant life. Thanks to John van der Linden for assisting on two field trips and offering support for protocol and report writing. Special thanks to Dr. Daniel Young, UW–Madison Department of Entomology, for serving as the scientific advisor for this project and answering numerous questions. Special thanks also to Susan Meier who sewed in situ *rearing bags on a moment's notice. We also thank members of the BugGuide online community for their valuable assistance in identifying insect specimens.*

This project was made possible with a generous grant from Prairie Biotic Research and additional funding from M.J. Hatfield. While the results are scant, the work provides a baseline for further research on this plant and its associated insects.

All specimens from this research have been donated to the Wisconsin Insect Research Collection.

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Preserving and Enjoying Wisconsin's Savannas

by Denise Thornton

Savanna, a landscape of prairie mixed with oak trees, was what the first European pioneers in this part of Wisconsin saw everywhere they looked.

Nate Fayram, Wisconsin DNR Southwest Field Ecologist told the audience at the Blue Mounds Area Project meeting last Thursday about how he and his team protect outstanding examples of Wisconsin's native landscape in State Natural Areas.

"Our job," Fayram says, "is to preserve Wisconsin's natural biodiversity and protect the best of the best so people can compare what they have to what a really high-quality site should be."

Crews throughout the state maintain 687 State Natural Areas (SNAs) encompassing almost 400,000 acres. Fayram's team working in Southwest Wisconsin conducts from 19 to 36 controlled burns a year on up to 5,000 acres. The rest of the year the crew is spraying herbicide on or pulling invasive plants on about 2,500 more acres.

We have a good idea of what Wisconsin looked like between the 1830s and 1860s because early surveyors walked the land and made detailed notes.

Photo by Julie Raasch

Nate Fayram, Wisconsin DNR Southwest Field Ecologist

Fayram mentioned a fire scar study underway in the Ridgeway Pine Relict. Pines in the state have shifted north over time, but some sites like the one near Ridgeway, contain big rocky cliffs that create a micro-climate where very old pines persist to this day. The stumps of long-dead trees can still be found there because the resin they are filled with acts as a preservative. By studying the growth rings in the stumps and also in living trees, they can pinpoint fires in the past, out of which they hope to create a fire history of the area.

"They found one stump that was cut about 1800," says Fayram.

"They can date that tree back to 1650 and see the fire scars on the growth rings and date them. Early findings show there were fire scars every two to six years, and not every fire left a scar."

Out of Wisconsin's 34.7 million acres, as many as 10 million acres may have been burned each year before settlement. The oak woodland and savanna was maintained by these frequent fires.

"Then," says Fayram, "Europeans showed up, cut the trees, plowed the fields and put cattle everywhere. Now natural woodland and savanna are super rare and critically imperiled in Wisconsin."

There are still some woodland and savanna areas left, preserved by the state and open to visitors. One of the best examples is Avoca Prairie and Savanna just north of Clyde in Iowa County. Located on an extensive outwash sand terrace along the Wisconsin River, Avoca Prairie and Savanna contains the largest natural tallgrass prairie east of the Mississippi River.

Oak openings, with large open-grown black and bur oaks, look much as they did during the original land survey of 1833. Even today, from many points on the prairie, the same pre-settlement

cont. page 11, see SAVANNAS

Photo by Julie Raasch

Meet Your New Board Members…

Cindy Becker

Cindy is happy to join the BMAP board in 2019. And why shouldn't she? BMAP is dear and close to her heart, having worked as the outreach ecologist for the organization from 2007 – 2014. Cindy has had the opportunity to work with landowners in the Driftless Area of WI, the Missouri Ozarks, and more recently, the coastal mountains of Oregon to promote conservation, stewardship and land protection. Currently, she is the coordinator for the Southwest Wisconsin Grasslands Network, a partnership of non-profit organizations and state and federal agencies committed to promoting grassland habitat, clean water, and thriving farms and communities in the SW Savanna region. In her spare time, you'll find her foraging for wilds and mushrooms, growing wildflowers in her garden, and running trails with the nimbleness of a shuffling penguin, but the mentality of a gazelle.

Greg Jones

Greg was at the University of Wisconsin Madison studying in the newly formed Institute for Environmental Studies department when he realized his chosen profession should be in Land Surveying. He then got a degree in Land Surveying at MATC. He went on to work as a Land Surveyor for the Engineering Division at the City of Madison where he worked for the next 30 years.

In 2003 he and Linda found their "dream property" about 4 miles north of Barneveld in the Town of Brigham. In January of 2004 he and his wife, Linda, closed on 22 acres. The land had 5 acres of open land and 17 acres of woods. Greg retired from Land Surveying in 2010 and built their home on the 22 acres. He had been a lifelong grower of vegetables, even truck farmed for a few years. His land stewardship really started in 2004 on that property.

The 17 acres of woods is managed two different ways. Half is oak woodland that has had prescribed fire on it for three years running. The balance of the woodland is managed as forest land with no use of fire. There are two prairie restoration projects on the property: one is about 1.5 acres and has been planted for 5 years. The other prairie area is about 2.5 acres and has had 4 growing seasons.

Linda Millunzi-Jones

When we built our house in 2010, on our 22 acres, a friend suggested that we join BMAP to learn about land stewardship and prairie restoration. Not only have we learned a lot but we've met great people with similar interests.

I grew up in Menomonee Falls, WI and graduated from UW-Madison in Recreation Resource Management in 1974. I moved up to Alaska to fulfill some dreams before returning to Wisconsin in 1983 to marry Greg Jones (another new BMAP board member) and raise our two daughters in Madison.

I worked as a Special Education Assistant in the Madison Public Schools and retired in 2015. I continue to pursue vegetable gardening, prairie and woodland restoration, outdoor recreation and the fiddling of old-time music.

I took the Master Naturalist class last summer through TPE and was excited when asked if I'd like to join the board of BMAP. I hope that my enthusiasm and ideas will help BMAP continue to be the inspirational and educational organization that it has been for me.

SAVANNAS *from page 10*

character has been preserved, with completely natural vistas still accessible in all directions.

Another great State Natural Area is Olson Oak Woods about half an hour's drive east of Dodgeville in the Madison School Forest west of Verona. This area has trails, and visitors can compare areas of white oak woods that have been managed by fire with those that have not been burned.

Fayram says that savanna and lightly wooded areas are very valuable because of the highly diverse ground layer of native plants that live there. Many plants that grow naturally in a prairie can hang on in an open savanna setting, and plants from the forest can also live there.

Savannas create a habitat for endangered animals, insects and birds. The red-headed woodpecker is a good example. This bird is distinguished from other woodpeckers by its completely red hood and large white wing patches. These gorgeous birds are declining in Wisconsin because of habitat loss.

They dart out from perches to capture flying insects or from the ground and shrubs. They rarely drill into trees for food. They make their nests in holes that they drill into dead trees.

Another bird that is suspected to be declining along with savanna and open woodland is the Eastern whip-poor-will. They nest on the ground in an open under-story.

"Savanna has the most species per square meter," says Fayram. "But when you get woody encroachment, diversity goes way down and we basically lose all our plant diversity. Some plants can hang on in a sub-optimal environment, but eventually they will die out. We have a window of time to restore them."

GREETINGS *from page 2*

Last year our net income increased significantly to $18,440. Almost our entire income is from individual memberships and donations being augmented only by $1,450 in grants and $90 in newsletter advertising. Net expenses remained steady at $7,730. The Ecologist and community education made up 86% of our expenses. Going into 2019 we have a balance of $32,765, enough to keep our Ecologist working half time year-round achieving what has been a long-time goal! Thanks to all our members and donors for their support. If you would like to get a copy of our 2018 balance sheet send us a request at info@bluemounds.org.

Speaking of membership, at the end of last year we had 121 active members, which is close to our long-term average membership with 10 new members joining. 70% of our members donate beyond the $30 basic membership. Tom and Eva Wedel were the recipients of our Bur Oak Award for outstanding stewardship on their expansive acreage near Argyle.

EVENTS

Save the Date

BMAP Summer Excursions 2019

June 20 ■ July 18 ■ Aug 15

Come meet other BMAP members and learn about their restoration and management experiences. Each month we'll tour a different member's property, see their challenges and successes and then retire to lawn chairs for an old fashion potluck and enjoy the setting sun. All tours begin at 6:30 pm so come early. We're still working out the details but reserve these dates on your calendar and watch for a postcard or email announcement. Check our website for updates.

Wrapping up, our Board of Directors experienced some turned over this year. Marie Raboin resigned to pursue business and motherhood full time and Michael Anderson stepped down after completing 2 terms. Special thanks to Mike who also served several terms as a BMAP founding member and director. On the plus side we are excited to be able to recruit 3 new directors in Greg Jones, Linda Millunzi-Jones and Cindy Becker. They join existing directors Amy Alstad, Anna Healy, James MacDonald, Carroll Schaal and Jennifer Theime who will guide BMAP through 2019. We're looking forward to a great year! Let us know what we can do for you. The best way to contact BMAP is a through an email to info@bluemounds.org or ecologist@bluemounds.org. Watch the website, future newsletter, our new E-Bulletin and post cards for reminders and update of project happenings in 2019.

WETLAND *from page 5*

2. Assess the area surrounding your wetland. You need to understand the surrounding area and how it is affecting the wetland to know if what you want to do is feasible.

Trochlell shared what she has learned from the 2009 Silvia Wilcox study of 20 restored wetlands in southern Wisconsin, namely.

— Most restored wetlands have invasive exotic species problems

— Seeding and maintenance will increase plant community integrity

— An intact seedbank increases plant community integrity

— Maintenance increases plant community integrity

— There are many wetland types not well represented in our area, such as bogs, fens or forested wetlands

Another key point Trochlell gained from the Wilcox study was that, berms are the last thing you want to do. "They are bad for plants," she said. "The process of berming distributes both the rhizomes and seeds of invasive plants in soil material and spreads them. It stimulates their growth of invasive species. All the soil horizons are disrupted, and there is compaction. When construction equipment pushes soil into piles - great damage is done."

Questions Trochlell says you need to ask before a wetland restoration:

Is the area a wetland now?

Was it a wetland prior to disturbance? You have to determine what was altered in the disturbed wetland and describe how soil, hydrology and vegetation have been impacted.

Is it practical to mitigate these impacts?

Wetland restorations can be very expensive -how much can you afford?

Will the restored wetland be maintained and protected in the future? Wetland restoration is an ongoing process.

WOOD-BETONY *from page 3*

Wood-betony might exert influence on a plant community by another, distinctly different means. The biologist Terence Laverty showed that mayapple (*Podophyllum peltatum*) fruit and seed set were higher for colonies less than 25 meters—versus 50 meters—from flowering wood-betony. Mayapple doesn't produce nectar, though most colonies are self-incompatible clones and rely on native nectar-seeking bumble bees for cross-pollination. Wood-betony, however, produces bountiful nectar and bumble bees love it. The result is a four-fold increase in the number of bumble bee visits to mayapple growing near wood-betony colonies and a corresponding 22-79% increase in fruit set and 27-42% increase in seed set. Whether wood-betony promotes pollination of other plant species, especially host species, requires further research.

What are the implications for restoration and conservation? Again, the right mix of plant species—including appropriate magnet species and those that rely on them—could set the stage for success or failure.

Wood-betony—a hemiparasite that might derive alkaloids from its hosts, can suppress the growth of some species, encourages the growth of others, and enhances pollination for a species that relies on bumble bees but has nothing to offer them—shines a light on a few of the nuances of preserving ecological communities. The loss of a species that prevents other species from overwhelming a community is essentially loss of the entire community. This is important to keep in mind when deciding where to focus efforts.

Learning about the factors that contribute to building an ecological community is reward enough to justify looking for subtle variations across the landscape. However, I also have to wonder whether restoration ecologists can exploit some the described natural processes. I'm always alert for ways to work with nature, ways to temporarily harness a natural process to achieve a goal. Are there circumstances where wood-betony, or other parasites and hemiparasites, might serve on the front line against infestations of aggressive exotic plants? Richard Henderson's simple experiment revealed there are powerful tools available if we invest time in looking for them. This is where the citizen scientist has an important role, especially given the difficulty of funding ecological research. As you enjoy the natural world, look for variations in plant communities that suggest one species is preventing another from overwhelming the whole. Do you see greater fruit and seed set when certain species appear together? Share your observations with others. Test your hypotheses. You could help find an affordable alternative to the expensive weapons—in terms of labor, machinery, toxic chemicals, and energy—currently deployed against aggressive exotic plants.

Note: This is a reprint from the Spring 2010 BMAP Newsletter (Volume 13 Number 3). It has been edited down to fit the space.

SWGN *from page 4*

Are YOU a landowner interested in participating in event planning, talking about your experiences, or attending? Please contact me!

If you are interested in learning more about the network, there are a few ways to do so. The SWGN will be distributing an updated Landowner Toolbox that will be available as a printed booklet and as a .pdf download, and a Partner Directory. Both of these useful resources are designed to connect you with the people and resources in the region. We are working on a landowner friendly interactive website that will provide information on SWGN programming, focus areas, current projects, and provide you, the landowner, with resources to help you manage grasslands of all kinds – from pasture management and grazing recommendations, invasive species control, prairie and savanna restoration, and descriptive information about the grassland birds that spend their time here during the breeding season and summer months. As for social media, a Southwest Wisconsin Grasslands Network facebook site (@SWgrasslands) is up and running, populated weekly with upcoming event listings such as pasture walks, workshops, and local volunteer opportunities, as well as job listings and information on issues pertinent to conservation in the region. This partnership seeks to implement changes at the grass roots level, as pollinators of values and partners in raising awareness and effecting change. Our goal, ultimately, is to develop effective outreach that educates, informs, and results in on-the-ground conservation actions by landowners and farm operators that protect and conserve grassland habitats and grassland wildlife in the Driftless Area of southwest WI.

If you would like to be a partner in this effort, Please! we would like to work with you. We have many ways you can volunteer – at events, in the field, in the office, or by participating in our focus group discussions. Further, we need your opinion to enrichen our understanding of the region and your voice as a spokesperson for your community. Drop by the office, call or email with questions. Thank you! Cindy B.

Cindy Becker, Southwest Wisconsin Grasslands Network Coordinator
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Prairie Spirit Wildlife Sanctuary

Our Mission:

Blue Mounds Area Project is a community–based organization that seeks to inspire, inform and empower private landowners in the southwestern Wisconsin region to enjoy, protect and restore native biodiversity and ecosystem health.

Our Objectives:

1) Promote understanding, appreciation and conservation of native woodlands, prairies, wetlands and savannas and their special species in an economically viable manner, through community outreach programs and private contacts.

2) Act as a clearing house for information from people and organizations involved in preserving native biodiversity including information about plant, animal and habitat identification, management, restoration, seed sources, native plant nurseries and invasive, nonnative species.

3) Encourage cooperative, volunteer restoration and management activities.

4) Identify public and private land use changes that may affect ecosystem health and promote community–based stewardship of the unique natural heritage of the Blue Mounds and the southwestern region of Wisconsin.

The Blue Mounds Area Project Newsletter is published three times yearly.
We welcome your comments, submissions, and advertisements.

Deadlines for submissions for 2019 newsletters:
Spring Newsletter — March 15, 2019
Summer Newsletter — August 1, 2019
Fall Newsletter — November 1, 2019

Send submissions to: newsletter@bluemounds.org
Editor: Marci Hess, mhess5599@gmail.com — Designer: Julie Raasch, jul@creative-zoo.com

If you are interested in assisting or volunteering for Blue Mounds Area Project, please contact us:

info@bluemounds.org
608-561-2627
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Name(s): _____

Address: _____

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Membership Status:
❍ Renewal ❍ New Member ❍ Gift Membership for

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❍ Other contribution to further the BMAP mission _____

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Make check payable and return to: Blue Mounds Area Project, PO Box 332, Mount Horeb, WI 53572

❍ Yes, I would like to receive information about site visits.

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"Look deep into nature and then you will understand everything better."

— Albert Einstein

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