



# Blue Mounds Area Project

Conservation and Community. Together.

Fall 2021  
Volume 24 Number 2

## Natural Communities of Southwestern Wisconsin

### — A New Summer 2021 BMAP Class Offering

by Denise Thornton

BMAP formed an exciting new alliance with the Botanical Club of Wisconsin this summer. The result was a four-session outdoor Natural Communities of Southwestern Wisconsin class, the brainchild of Micah Kloppenburg, BMAP ecologist, and Kevin Doyle, DNR botanist and member of the Botanical Club of Wisconsin.

“The UW-Milwaukee field station offers a class called Vegetation of Wisconsin - where they travel around the state,” said Doyle. “I felt the Botanical Club was uniquely qualified to provide similar classes for our area.”

The classes were led by:

- Doyle, who provided overviews of each plant community to put plant ID into context so that people can better understand what pressures plants are responding to and how to encourage native plants to thrive.
- Stephanie Lyon, Assistant Professor of Biology at UW-Stevens Point, who provided reproductive strategies of plants in the context of their environment.
- Mary Ann Feist, Senior Academic Curator of the Wisconsin State Herbarium, who offered specific details to help with plant ID.

**This summer’s new alliance with Botanical Club of Wisconsin**

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BMAP Natural Communities Class participants at the Pleasant Valley Conservancy.

Photo by Brooke Lewis

# President's Message

Doug Hansmann, BMAP President



Doug Hansmann

Greetings from your new BMAP board president.

I came onto the board a little over a year ago, primarily to facilitate the connection between the board and its communications to BMAP members. My

wife, Denise Thornton, and I had recently taken on the job of co-editing our BMAP newsletter.

Denise has a master's degree in science journalism, and has long applied her craft to writing about ecological awareness and restoration. For the past several years, building on my own career as a

scientist, including a background in conservation biology, I have been teaming up with Denise to write about earth-enriching issues.

Did you know that individuals and families own well over half of Wisconsin's forestland? And while Southwestern Wisconsin is recognized as one of the best grassland conservation opportunities in the Upper Midwest, less than one percent of this exceptional region is publicly owned. So while it is essential to restore and preserve parks, forests, and state natural areas, there is also great value in fostering a focus on privately owned natural lands.

Restoring and caring for our own private lands is what brought many members like Denise and me to BMAP. And our vibrant 150-member-strong organization clearly aids in making a broader impact.

As the beauty of another Wis-

consin autumn unfolds across our many local remnants and restorations, let's take joy in our conservation efforts at both the day-to-day individual level and in the broader connections that keep us happily ensconced in the Driftless.

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## There is great value in fostering a focus on privately owned natural lands.

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Like a lot of organizations, BMAP continues to navigate the pandemic waters as best we can. We hope to get back to "normal" soon, but our summer events were more restrictive than desired, and it's still not clear whether our winter lecture series will be virtual or in person. More to come on that subject when the lectures are announced in December.

*cont. page 3, see PRESIDENT*

# Ecologist's Report

Micah Kloppenburg, BMAP Ecologist



Micah Kloppenburg

## Using Goats in Your Restoration

In the four summers that I've been conducting site visits as the

BMAP Outreach Ecologist, this is the first summer where I worked with not one, but two landowners who have employed goats as part of their restoration tool set! The landowners' goals? To clear invasive brush, allow for the planting of an open savanna and woodland, and support native herbaceous growth. In both cases, the land-

owners were using goats (quite successfully) to browse down dense woody brush on steep, wooded slopes.

While I had herd (pardon the pun) of goats being useful for woody brush control, I had never seen them in action, and I really enjoyed seeing their impact on the landscape firsthand. These two site visits were exactly the motivation and sense of excitement I needed to inform myself and dig into the research and practitioner experience of goat grazing for

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### Landowners are using goats to browse down woody brush on steep, wooded slopes.

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restoration. Outlined below are a summary of what I've learned and my reflections on goats as native habitat engineers.

Two key goat facts:

1. Goats do not graze, they browse. This means they prefer to eat all manner of herbaceous and woody plants (stems, twigs, buds, and leaves) starting just below their eye-level and up to six-feet or more. In contrast, grazers prefer herbaceous species and nip off plant material at ground level.
2. Goats really prefer to eat woody brush. According to data collected in Wisconsin by Cherrie Nolden, goat forage preference was highest for woody species (85%), then forbs (12%), and lastly grasses (3%).<sup>2,3</sup> In addition, diet preference is both a heritable trait and a teachable fancy (they learn from their mothers and herd members)!<sup>1,2</sup>

Goat browse top kills woody species by defoliating them of their leafy growth and by girdling the

*cont. page 3, see ECOLOGIST*

## ■ BMAP ON LINE ■

Our website: [bluemounds.org](http://bluemounds.org)

BMAP's monthly eBulletin for announcements, habitat restoration tips, and more:

[bluemounds.org/ebulletin.html](http://bluemounds.org/ebulletin.html)

BMAP's Facebook page for events and environmental news:

[facebook.com/BMAPcommunity](https://facebook.com/BMAPcommunity)

BMAP's Facebook group for sharing photos, ideas, and activities:

[facebook.com/groups/BMAPcommunity](https://facebook.com/groups/BMAPcommunity)

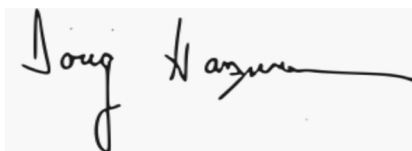
### PRESIDENT *from page 2*

As an organizational reminder, BMAP shifted to a calendar-year membership cycle earlier this year. That means membership renewals received this fall will keep you a member in good standing on through the end of 2022. This change was made to simplify our record keeping and streamline our membership appeal/renewal messaging. This minimizes Micah's administrative tasks, allowing him to focus more on our conservation and education mission.

*Please note that for the first time in over 20 years, our membership dues have increased.*

For 2022, a Basic membership is \$40. Other levels are: Contributor \$70, Supporter \$100 and, new this year, we're offering a Lifetime Membership for \$1000.

BMAP relies on your generosity in terms of memberships and additional donations, and we greatly appreciate your continued support!



### ECOLOGIST *from page 2*

stems when the goats chew off bark. Most importantly, continued browsing over multiple years manages the resprout and regrowth of top killed woody species and effectively prevents complete closure of the shrub canopy. As a result of the increased sun penetration to the herbaceous understory, goat browse helps preserve remnant sun-loving prairie, savanna, or woodland herbaceous plants that were being choked out by the dense shade (see my "pressing pause" comment below).

Overall, the efficacy of goat browse as a means for woody control is dependent on the browsing system and browsing longevity (number of years or seasons browsing is to be employed). Reflecting on all that I've read, heard, and seen, an open goat paddock seems like an easy entry point to A) simply press pause on woody succession in a given habitat while a broader management plan can be designed and implemented; and/or B) initially support the access and efficacy of dedicated mechanical brush control (i.e. cut-and-treat).

In comparison, rotational browsing or managed intensive browsing seems like an exciting and effective approach that will A) in just few years, temporarily suppress the woody understory and really allow for prescribed fire (depending on fuel) to complement woody control; or, B) over many more years, and in combination with prescribed fire, completely eliminate the woody understory. In either browsing system, a well-designed management plan that combines goats, fire, and mechanical control appears to be a winning combination!

One goat management scenario that I believe could be particularly helpful is in woodlands where implementing a regular prescribed

fire regime is a challenge. In the years between woodland burns, goats may be an especially effective option to "organically" chew back and top kill shrubby regrowth. Essentially, a land manager would integrate or incorporate goat browse into their fire rotation, supplementing or, at times, even substituting goat browse in place of fire as a woody deterrent.

## **In the years between woodland burns, goats may be an especially effective option to "organically" chew back and top kill shrubby regrowth.**

In the end, I came away with a number of lessons learned on using goats for native habitat restoration and management. Here are the top three:

1. The impact of browse depends on your goat browsing system: whether you have a single open, continuous paddock, or sectioned, rotational paddocks (many small paddocks). Open paddocks with limited browsing years will never result in brush eradication. As such, you should match your restoration goals, expectations, and additional management needs to the type of browsing system you are able to employ and the configuration of your paddock(s).
2. Regardless of browsing system, one growing season of goat browse alone will not control brush. Five or more years of high intensity browse should cause significant shrub mortality and may even eliminate some targeted woody species. The best practice is to rotationally browse goats through small paddocks with a high stocking rate, making sure the goats browse each

*cont. page 14, see ECOLOGIST*

# Summer 2021 BMAP Property Tour Recaps

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June 5th, at

## Lynn and Jane Knutson's Arena Township Property

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Lynn Knutson grew up on a farm in Minnesota and always wanted to have some land of his own. He came to Madison in 1968 where he earned a PhD in nuclear physics and then joined the faculty and worked on campus till he retired. "I needed something more," he said. "Having land to take care of got me back outside and wandering the woods."

"There is so much good land in the Driftless Area," he said. He was particularly looking for land that did not have to be accessed by a road down in the valley. "The beauty of Blue Ridge Road is that it runs along the ridge. There aren't many places like that."

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### "The beauty of Blue Ridge Road is that it runs along the ridge."

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"The property was in good shape," he said. "Anything that wasn't in the woods had been farmed. We bought in 1984 but within about 10 years the area that had been pasture was starting to get ugly with multiflora rose and other invasives. I decided I needed to be able to burn it so I could have someone plant some prairie grass."

The Knutsons hired a company in the mid 1990s to do an installation on two acres that had been pasture. "The plan was burn it in the

spring, wait for it to green up, hit it with RoundUp and then plant," said Lynn. "They convinced me to put down more grass seed than normal, so I have the worlds biggest stand of indian grass and big blue stem. When I burn that, it is a gigantic fire."

After that first planting, Lynn started doing the planting and burns himself, relying on good conditions and good breaks. "I had another four open acres that I wanted to establish in prairie. I would do a little each year following the same procedure: a spring burn, glyphosate application in late spring and summer, then plant in the fall with seed sourced from the tall grass prairie, purchased seed, and seed shared by friends."

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### "It does a lot of nice things if you can carry a fire through your woods, which means you need oaks."

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It's taken about six years to get that four acres, and that prairie, which we think of as the short grass prairie, is really pretty nice right now.

Lynn burns everything he can burn — including woods. "One of the reasons I got started burning was because of a colleague, Tom Wise," said Lynn. "He's well known today for his work with the Ice Age Trail. We worked in the same lab, and he urged me to take a burn class. He was burn boss for our first few burns."

Lynn shared a lot about woodland burning during the visit. He said a well-time spring burn can greatly help eliminate garlic mustard seedlings. "It really does a lot of nice things if you can carry a fire through your woods, which means you need oaks. Their leaves burn. It clears out a lot of underbrush,

and I start to see nice things appearing in the woods.

Micah Kloppenburg said the understory plants (herbaceous species) there are indicative of southern dry-mesic woodland, with sweet cicely (*Ozmorhiza* sp.), black snakeroot (*Sanicula* sp.), wood avens (*Geum* sp.), tick trefoil (*Desmodium glutinosum*), maidenhair fern (*Adiantum pedatum*), yellow bellwort (*Uvularia grandiflora*), may apple (*Podophyllum peltatum*), hog peanut (*Amphicarpa bracteata*), lop seed (*Phryma leptostachya*), baneberry (*Actea* spp.), geranium (*Geranium maculatum*), berry brambles (*Rubus* spp. and *Ribes* spp.), and spikenard (*Aralia racemosa*) among many other native species.

"I think a lot of people are not sure how to burn in the woods," said Lynn, "but the woodland burns are so easy. If you burn in the spring, a firebreak path is all you need, use a side discharge lawn mower to blow all the leaves off, and you are left with mineral soil. Walk along, light your fire and do a multi-acre burn."

Lynn warned the tour participants to be careful in pines. "We've got our own mini tension zone on our land — just like Wisconsin has — between the prairie and the pines. I once lost a fire into pines for a short period of time. If people aren't paying attention, fire runs across the pine needles. Then the pine tar lights, and it starts to burn up the trunk."

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### "A well-timed spring burn can greatly help eliminate garlic mustard seedlings."

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Then eight years ago, Lynn and Jane found a remnant on adjacent land and managed to buy it. "We are working like crazy to get all the buckthorn and multiflora rose

out of it and expanding it by cutting brush, trees, and occasionally burning.

Micah said the remnant includes pussytoes (*Antennaria* spp.), hoary puccoon (*Lithospermum canescens*), blue-eyed grass (*Sisyrinchium*

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**“We’ve got our own mini tension zone on our land — just like Wisconsin has — between the prairie and the pines.”**

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*campestre*), robins fleabane (*Erigeron pulchellus*), prairie rose (*Rosa carolina*), pale spiked lobelia (*Lobelia spicata*), thimbleweed (*Anemone virginiana* and *cylindrica*), flowering spurge (*Euphorbia corollata*), new jersey tea (*Ceanothus* sp.), milkwort (*Polygala sanguinea*), leadplant (*Amorpha canescens*), bergamot (*Monarda fistulosa*), prairie dodder (*Cuscuta* sp.), ground cherry (*Physalis longifolia*), whorled milkweed (*Asclepias verticillata*), poke milkweed (*Asclepias exaltata*), Canada and

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**“One of the joys for the Knutsons is watching new species appear in their restorations.”**

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Illinois ticktrefoil (*Desmodium canadense* and *illinoense*), hoary vervain (*Verbena stricta*), blue vervain (*Verbena hastata*), Missouri goldenrod (*Solidago missouriensis*), stiff goldenrod (*Solidago rigida*), old field goldenrod (*Solidago nemoralis*), showy goldenrod (*Solidago speciosa*), hawkweed (*Hieracium* sp.), pasture thistle (*Cirsium discolor*), black-eyed susan (*Rudbeckia hirta*), prairie violet (*Viola pedatifida*), evening primrose (*Oenothera* sp.), sky-blue aster (*Symphyotrichum oolentangiense*), aromatic aster (*Symphyotrichum oblongifolium*), round-headed bush clover (*Lespedeza capitata*),

yarrow (*Achillea millefolium*), dogbane (*Apocynum cannabinum*), and joe pye (*Eutrochium purpureum*) among many others.

One of the joys for the Knutsons is watching new species appear in their restorations. “Shooting stars appeared two years ago in the short grass prairie,” he said, “and other species that I have no idea where they came from like cream gentian.

“Jane was a floral designer and event decorator in Madison,” said Lynn, “and she’s always working with our native flowers now.”



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**June 19th, at**  
**Mike Samuel’s**  
**and**  
**Nancy Thomas’**  
**Perry Township Property**  
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For over 25 years, Mike Samuel and Nancy Thomas have been working to create native prairies and manage for oak woods on their 66 acres in the Town of Perry that includes a dry, sandy goat prairie, sedge meadow, and oak woods.

“We came out on New Year’s Day 1993 and tromped up one of the creek beds in the snow, saw lots of turkey tracks, and said, ‘Yup. This is it,’” said Mike. “We could see the remnants of prairie plants sticking through the snow and saw the potential,” added Nancy.

Mike and Nancy were well suited to see that potential. Nancy worked as a veterinary pathologist at the National Wildlife Health Center, which does diagnostic and research work for the Department of the Interior and Mike is a wildlife ecologist.

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**“We came out on New Year’s Day 1993 and ... could see the remnants of prairie plants sticking through the snow, and saw the potential.”**

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Their primary goals are to manage for wildlife. They have about 50 acres in a managed forest program in a mixture of oak, hickory, and cherry, and also 20 acres in vari-

*cont. page 6, see PROPERTY TOURS*

ous states of historic prairie in the Conservation Reserve Program. “We have been slowly managing the prairies to get more diversity of forbs, grasses, and insects,” Mike said.

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**They converted a small corn field by spraying, then planting with no-till drilling. “We’ve been quite pleased with the no-till.”**

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They planted their first prairie with the help of friends from work. “That was a learning experience,” Mike remembers. “That field was dominated by tall grasses by 1999. We’ve slowly increased diversity through fall burning and mowing.”

Next they converted a small corn field by spraying, then planting with no-till drilling. “We’ve been quite pleased with the no-till,” said Mike. “We have about 12 acres we did in 2008, and in 2014 we burned and inter-seeded for more diversity. We just burned that prairie again last fall and it seems to be doing well.”

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**Mike and Nancy have set up a conservation easement on 50 acres ... and are working to set up an endowment to provide management funds into the future.**

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Their most recent project is a 2-acre pollinator field, with spraying last fall followed by drill planting and mowing this year. This fall they will hand spray the few thistles coming up. “Hopefully in five to six years, we will have something nice up there,”

said Mike. “We are just beginning to see things we planted in our second prairie years ago.”

Mike and Nancy have set up a conservation easement on 50 acres with the Driftless Area Land Conservancy and are working to set up an endowment to provide management funds into the future through the National Resources Foundation.

Mike and Nancy also put effort into their woods; removing invasive species, particularly honeysuckle, multiflora rose, buckthorn, and garlic mustard. They have been gratified to see native brush coming back, including viburnum, dogwoods, native honeysuckles, and hazelnuts. They have found that burning followed by spraying really sets garlic mustard back — at least temporarily.

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**“Our terrain is hilly. In between the hills, we have three wet drainages, and two of them do well as sedge meadow.”**

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“Our terrain is hilly,” said Nancy. “In between the hills, we have three wet drainages, and two of them do well as sedge meadow. In the year-round creek we have battled reed canary grass and hold that back pretty well, even though the neighbor upstream has a lot of it. The sedges have a good foothold, so it is possible to hold it back a bit.”

Nancy’s pride and joy are the seven orchid species they have identified in the wet areas and also in the fields and woods. “I’m particularly excited about trying to maintain good habitat for them,” she said.

“We are finding as we age that we are depending more and more on Quercus Land Stewardship Ser-

vices for projects that we used to take care of ourselves,” said Mike. “They have been a real benefit for

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**“We have been fortunate to get some cost share and help ... to remove brush and garlic mustard in the woods, and ... with some of our burns.”**

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us in their help, expertise and advice, and they are our burn crew these days.”

Mike said, “We have been fortunate to get some cost share and help on doing the work from the managed forest program to remove brush and garlic mustard in the woods, and some DNR funds thru the Driftless Area Land Conservancy to help with some of our burns.”

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**“I have a tendency to focus on the weeds ... and tour members gave us a more balanced view.”**

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“We had a good mix of people with different backgrounds at the tour,” said Mike, “who were able to share their information. Getting feedback from others made us feel better. I have a tendency to focus on the weeds I don’t like, and tour members gave us a more balanced view. Some have even offered to help inventory the wetter areas.”



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July 10th, at

## Jim Elleson's Vermont Township Property

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Many people know Jim Elleson as the founder of Quercus Land Stewardship Services, helping land owners with management challenges since 2003. That business was inspired by Jim's experience managing his own 115 acres: with about 40 acres of forest, 40 acres of prairie and wetland sedge meadow, and 11 acres of cropped field.

"I wanted some land to take care of, and the property we were living across the street from came up for sale," he remembers. "It was available and attractive, and we bought it in 1988 — but it was in the late 1990s that I really started managing it and understanding better what management meant."

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### **"Fire was an integral part of how our native ecosystem and vegetation developed."**

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One of Jim's first acts was to plant a few thousand white pines that still trace a hillside contour. "A lot of people like white pines," he said. "But I learned that this is not a place they belong." He noted that he was not alone in this blunder and that even Aldo Leopold planted pines before embracing a better-informed dedication to ecological restoration and native habitat.

Early on, a neighboring farmer suggested Jim burn a field. "Since then I have done a lot of fire management," said Jim. "Fire was an integral part of how our native

ecosystem and vegetation developed, and I feel that returning fire to the land is a critical part of restoration."

Jim shared with tour participants how he divided the property into burn units, and how they were burned in the past year. "As you get to landscape-scale burns, there is inherently a patchiness to the burn, which provides refugia," he said. "Also, there is a limitation on how much I can burn in a given year, so you always have unburned areas."

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### **"As you get to landscape-scale burns, there is inherently a patchiness to the burn, which provides refugia."**

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There was not time on the tour to explore the wetland Jim has restored. "It was actually strips of pasture along Vermont Creek with cropped field on either side when we bought it," said Jim. "One field was becoming too wet to farm. Another field, I put into CRP. Then I got some help from the Fish and Wildlife Service to break up the drainage tiles, fill the ditches, and put in a couple of wildlife scrapes (shallow ponds of about half an acre each)."

The DNR also provided funds to re-establish a meandering trout stream that had been ditched and straightened before 1937. "It has been successful for trout," said Jim. "But they did not have the funds to complete the restoration to fully connect the stream channel to the flood plain."

His wetland restoration efforts in the valley below have been primarily focused on cattail cut-and-treat (effective, though very slow) and reed canary grass suppression (fire and herbicide).

Jim has been removing invasive

brush in his woodlands for over 10 years. He got some funding in 2018-19 to accelerate the process and was able to uncover the rock outcroppings on the south-facing slope and open up the whole slope. He's been spreading native seeds and has established some prairie openings while trying to stay on top of the invasive weeds. "That's been a gradual process and pretty successful with the help of herbicides."

When asked about his thoughts or concerns around Canada goldenrod dominance, Jim responded that he doesn't do much to manage for it in his plantings. A Quercus employee and ecologist, Rob Schubert, mentioned that species of dodder are parasitic to goldenrods and exhibit specificity in host selection. Canada goldenrod growth is noticeably suppressed when parasitized by the vining dodder.

Jim said he has been watching dodder, which is a parasitic vine that climbs up plants like goldenrod and lives off its host. "I've seen it on goldenrod, jewel weed, teasel, and queen anne's lace. A good patch of dodder seems to affect five- or six-foot square patches of golden rod. It doesn't spread massively, but here and there you get these little pockets of suppressed golden rod where other things can start filling in."

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### **"Canada goldenrod is noticeably suppressed when parasitized by vining dodder."**

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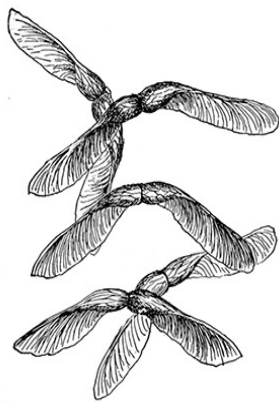
Jim has had more time for his own restoration projects since retiring from Quercus Land Stewardship Services in 2020, though he is staying on for the next few years to support the transition to the new owner, Alex Wenthe.

## NATURAL COMMUNITIES *from page 1*

Linda Millunzi-Jones facilitated the classes, and the first class explored the ecosystem of Southern Mesic Forests, in a pocket of sugar maple-basswood forest on the east side of Blue Mound State Park on May 15. The second class met June 19 to examine Dry Prairie at the Shea Prairie unit of the Mounds View Grasslands. On July 10, the third class met to study Oak Savanna at the Pleasant Valley Conservancy State Natural Area. The group met July 24, at the property of Mike Samuel and Nancy Thomas, where the class got an overview of sampling practices and then applied their new plant ID skills in the Samuel/Thomas prairie restoration. [Learn more about the Samuel/Thomas restoration work in the 'property tour' summary article on page five of this newsletter.]

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## SOUTHERN MESIC FOREST



In pre-settlement times, oaks were dominant in the southern part of the Driftless area because southern mesic forests, dominated by sugar maple and basswood (then covering about 18% of the Driftless Area, and only 3% of the region south of the Military Ridge) are not as well adapted to fire as oaks. They don't put as much energy

below ground as oaks do, so they can't re-sprout as effectively, and their relatively thin bark is more susceptible to the fire. Today we find sugar maple forests on steep east- and north-facing slopes that were protected from the frequent fires that swept in from predominant westerly winds.

"One reason we get sugar maples on slopes is because they are fire protected, but it could also be because there is often water seeping out of these slopes providing nutrients, and in this case dolomite from the limestone provides minerals," said Doyle. "And it's also the slow breakdown of all the material on the forest floor that isn't getting burned up."

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### The Botanical Club is uniquely qualified to teach about Wisconsin's Natural Plant Communities.

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Maples allow only about 1% of sunlight to make it to the forest floor. Compared to an oak woodland, there is not a lot of structural complexity and almost no shrub layer. Wind (not fire) is the most important factor in southern mesic forests because it creates openings in the canopy when a tree comes down.

Maple saplings can survive a long time waiting for an area of light to open up in a way that oaks can't, although red oak can sometimes be found in the mesic forest. "Red oak has more shade tolerance and can hang on for an opening in the canopy," said Doyle. "Also red oaks grow straight up to reach the light like sugar maples. White oaks tend to stretch out searching for light, and bur oaks, with low-growing branches, are at the far end of shade intolerance." Basswood and ironwood are also common in the Southern Mesic Forest.

The floor of this type of woods is dark, closed in, and fairly wet, Stephanie Lyon noted. Once mature maples become the dominant life form on the landscape, they maintain this through massive seed production, a strategy that helps ensure that the deer won't get them all.

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### The spring canopy closes in fast, and spring ephemerals can take 7 years from seed to flowering.

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In the spring, the canopy closes in fast, so the forest floor plants may need a long time to build up the resources to reproduce. Spring ephemerals like trout lily can take seven years from seed to flowering. Most of these herbaceous plants have well-developed underground storage systems.

"They might come up as vegetative plants for several years, using the narrow window of light to photosynthesize and then die back down, waiting for a year when they can get big enough to produce flowers. Then they have to get pollinated," said Lyon.

"Some plant species like those in the buttercup family use wind to pollinate," said Lyon. "They flower very early when there is more possibility of wind."

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### Jack-in-the-pulpit can be a male 'Jack' or a female 'Jill' — depending on conditions.

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Some plants time pollination to when the first insects are just starting to emerge. "As with the last several years in particular we can get a random hard frost in early May, and the timing with insects is tough," Lyon said.



Most plants in the understory that are insect pollinated must be generalists. A lot of them have fairly open, bowl-like flowers in yellows and whites to attract whatever is around. That tends to be a lot of small, ground-nesting native bees who have made a nest in an exposed patch of soil.

Jack-in-the-pulpit can actually be a male “Jack” or a female “Jill” — depending on conditions. “They are a fine example of the waiting-it-out strategy,” said Lyon. “They can change year by year. Their vegetative form produces a leaf, and takes what resources it can, then dies back down. When they have more stored energy, they come up as female. Jacks are usually single-leaved individuals and tend to be smaller than the Jills. A lot more

energy goes into the female end of reproduction.”

### - Nutrient Cycle -

Sugar maple leaves are different than oak leaves. Oak leaves have more carbon and lignin, and they burn better, so when fires are coming through, oak leaf litter sustains the burn. Sugar maple leaves have a higher nitrogen-to-carbon ratio, and they break down a lot faster.

Another source of nutrient comes from downed woody debris. Downed trees release a slow trickle of energy back into the system. This benefits soil microbes and fungi that the plants form symbiotic relationship with and need to survive.

“When I’m looking for a high quality southern mesic forest, I am looking for those downed trees and snags,” said Doyle. “Nineteen snags per acre is a good average for an old growth sugar maple forest. You will notice in a managed

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## **Nineteen snags per acre is a good average for an old growth sugar maple forest.**

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forest, the downed trees are often absent because the timber harvest machinery is taking everything. You’ll even see stands that have really big trees, but the ground looks like it’s been vacuumed. Not good. Different micro-habitats that provide nutrients and moisture are a critical part of the plant community.”

### - Mesic Forest Stressors -

**Earthworms:** Earthworms are the biggest threat to the mesic forest because they are not native to Wisconsin. They were brought in by European settlers. Today there are different kinds of earthworms that affect different parts of the soil, but the bottom line is that they munch up all the decomposing material in the upper levels of the soil, and they speed up the nutrient cycling too fast for plants to get to them. They also eliminate a lot of the essential fungi and soil microbes either by breaking them up or eating them. Now, a lot of the relationships that plants once depended on are gone.

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## **Areas with earthworms “feel more like walking on pavement.”**

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“Wormed areas are easy to spot,” Doyle said. “You can feel it with your feet. Wormed areas feel more like walking on pavement.”



Photo by Denise Thornton

The southern mesic forest at Blue Mound State Park.

cont. page 10, see NATURAL COMMUNITIES

There are not a lot of management opportunities with earthworms. However, studies are also finding that there are connections being drawn between deer and earthworms, indicating that if you control the deer, the earthworms will decrease as well. “It’s likely that the deer are adding nutrients in their pellets, and earthworms are surviving on that,” he said.

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**“When the native seed source is gone, but there are a lot of nutrients available, invasive generalists move in.”**

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**Invasives:** Garlic mustard and honeysuckle are breaking up important connections between the plants and soil microbes and fungi because their leaves contain chemicals that change the soil’s nutrient recycling. “It’s not necessarily a crowding out (although in some cases it is),” Doyle said.

**Grazing:** Deer, of course, play into this by creating openings for invasives to come in - adding nutrients to the soil that earthworms take advantage of.

“Basically everything in Wisconsin that could be grazed for agriculture has been grazed,” said Doyle, “and there are impacts from that, including soil erosion and compaction.” Livestock browse preferentially, and even after they are removed, the Southern Mesic Forest seed bank is affected. When the native seed source is gone, but there are a lot of nutrients available, invasive generalists move in. “When I see a heavily-grazed site, there are a lot of prickly ash, grasses, sedges, and ferns,” Said Doyle. “The other grazer is deer, and they don’t eat a lot of sedges and grasses or ferns; those are the plants that are left.

## DRY PRAIRIE



Doyle noted that the word prairie comes from a French word meaning meadow because the French had no word for what they saw when they encountered the American Prairie. “It’s cool to think how unique in terms of global ecology this is,” Doyle said.

John Curtis, in *Vegetation of Wisconsin*, states that prairies covered about 6% of Wisconsin pre-settlement, but south of the Military Ridge was the biggest prairie area in the state, and the landscape was a continuum of prairie into savanna into oak woodlands. Dry prairies are commonly found on hill tops.

“As we walk upslope,” said Doyle, “we’ll watch vegetation transition from about knee height to ankle height. That is in large part due to the hemi-parasitic plants. These plants siphon off water and nutrients from the surrounding vegetation. The result is not unlike large herbivores grazing a grassland. They can spread by long rhizomes

and can cover large areas and can increase diversity in the prairie by reducing the competition from dominant grasses.”

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**Hemi-parasitic plants “increase diversity in the prairie by reducing the competition from dominant grasses.”**

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Mary Ann Feist identified false toadflax (*Comandra umbellata*) as a valuable hemi-parasite. “Though it does photosynthesize, it also taps into the roots of other species for their water and minerals,” she said. “It’s a native and can parasitize on over 200 different species.” Other hemi-parasites include lousewort (*Pedicularis lanceolata*), and wood betony (*Pedicularis canadensis*). Unfortunately, a lot of these are not easy to germinate and propagate on a large scale.

“The most important thing to support prairie is fire,” said Doyle. “Fire prevents woody shrubs and trees from establishing.”

It also reduces leaf litter. The buildup of biomass on the ground is not good for prairies, which need more light to the ground to allow plants to grow. Sun on the soil increases the activity of the microbial community in the soil and affects nutrient cycling, and the warming soil can trigger seed germination.

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**Historically, fires burned prairies frequently, however, they didn’t necessarily burn uniformly.**

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Historically fires burned prairie frequently, however, they didn’t necessarily burn uniformly — so there were always some patches that burned one year and not

another creating a shifting mosaic. “When you are thinking about managing your own site,” said Doyle, “it’s important to burn half to 2/3 in a year and leave an area unburned where important animals and plants will survive. Certain prairie plant seeds are more viable in burned areas and some are more viable in unburned areas, so mix up your management strategy.”

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**“Certain prairie plant seeds are more viable in burned areas and some are more viable in unburned areas.”**

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“If you cannot use fire,” Doyle said, “mowing has been shown to mimic some of the things fire can do. But you have to remove the vegetation that you are cutting or it will build up as thatch. That removal takes an effort and may explain why grazing can be used as a surrogate for burning to some extent.”

“Pre-settlement grazers in Wisconsin were probably elk and bison. They focused more on grasses,

which allowed more forbs to flourish. Whereas cattle go after forbs more than grasses, so in areas that have been heavily grazed by cattle many of the nicer prairie plants will be gone.”

Asked about how much mesic prairie is left in Wisconsin, Doyle said, “Mesic prairie grows on rich, black soil, and those were the spots that got farmed first. There is only a fraction of one percent of those prairies left. And if they aren’t managed, they are invaded by weeds much faster than a dry prairie.”

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**“Pre-settlement grazers ... focussed on grasses, which allowed forbs to flourish, whereas cattle go after forbs.”**

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Lyon said wind is a major component in much prairie pollination. “Wind pollination is an interesting strategy that grasses use. Everything becomes a lot less about attracting pollinator animals, so there is not so much flowering. Rather than being carefully placed for pollinators, the goal is to get

pollen into the wind, so the male anthers are on long, dangling filaments. Wind pollinators tend to make a lot of everything.”

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**For pollination, “grasses separate the male and female in time rather than in space.”**

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“Grasses separate the male and female in time rather than in space. After the anthers have dropped off, the female styles have the whole length of the flower to capture pollen. They are like filter feeders,” said Lyon. “They often have something feathery to capture pollen as it blows by. Somehow they co-exist with many other species all blowing their pollen around.”

The asters, the next biggest family in the prairie, are generalized in what pollinators they attract — drawing in both small native bees and some flower flies. These insects will often be seen only at certain times of day because of the way that the pollen is presented.

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**With their ability to work with bacteria and fix nitrogen, legumes were, historically, at a competitive advantage.**

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Legumes are the third largest prairie family. Their flowers are often purple with a landing platform. Because fire removes thatch, the nitrogen from that plant material goes into the atmosphere and is lost. The phosphorous goes down into the ash and remains, so prairies are really nitrogen limited. Legumes (with their ability to work with bacteria and fix nitrogen) were, historically, at a competitive advantage.



Photo by Denise Thornton

Dry Prairie at the Mounds View Grasslands Shea Prairie.

*cont. page 12, see NATURAL COMMUNITIES*

## - Dry Prairie Stressors -

**Nitrogen:** Nitrogen deposition from air pollution and agricultural fertilizers adds too much nitrogen to the soil. Legumes are losers in this dynamic because this unwanted nitrogen to the system takes away their competitive advantage. The invasive sweet clover provides

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### **Nitrogen deposition from air pollution and agriculture ... eliminates legumes' competitive advantage.**

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two to three times more nitrogen to the prairie than native legumes, so they are also bringing too much nitrogen into the system and messing up the soil for native plants.

#### **Pollinator Loss and Fragmentation:**

Flowering is an energetically-expensive process for plants; It is tissue that doesn't photosynthesize, and loses water. If pollinators aren't available to visit, this is a costly waste of energy.

Pollinator crashes can cause isolated prairies to suffer from inbreeding depression. "My first concern about prairie forbs is always inbreeding," said Doyle. "It's a big issue." A lot of prairie plants are self-incompatible, so their pollen can't actually fertilize the same individual. "When prairies are fragmented, these self-incompatible traits can be really harmful."

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### **"My first concern about prairie forbs is always inbreeding. It's a big issue."**

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Fragmentation isolates the many prairie plants with heavy seeds. "Heavy is good when you are trying to establish extensive root systems without a lot of available nutrients. Investing in each

individual seed can be an important strategy for some plants," said Lyon. "That's why collecting seeds and moving them around is important."

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### **"... collecting seeds and moving them around is important."**

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#### **Climate change:**

Climatologists predict southern Wisconsin is going to be generally dryer with extreme rain events. That would benefit prairie and oak. However, more carbon dioxide and nitrogen are predicted, which will encourage invasives and might allow prairie shrubs and vines to take over.

"Hotter, dryer conditions could favor oak, but what happens when seedlings are shaded out?" Doyle asked. "The reality on the ground is that oaks are not in a good spot. They are already stressed because of too many deer and other threats. Our existing oak may not be in good enough shape to take advantage of the coming changes."

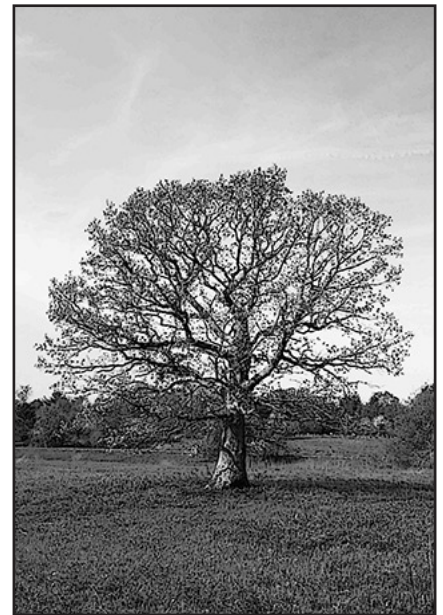
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### **Climatologists predict there will be more carbon dioxide and nitrogen, which will encourage invasives.**

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**Invasive Brush:** Fire doesn't eliminate brush, but it will stunt it and can prevent encroachment. If you take a few years off from burning, that brush comes right back. Much brush is clonal and spread radially out from the edges. "Research has shown that if you burn every year, that uses up the energy clonal brush puts into radial growth, but if you burn every three years, that's enough time for brush to conserve energy, and fire actually stimulates its growth," said Doyle.

## Oak Savanna



Before European settlement, Wisconsin had 5-1/2 million acres of oak savanna, yet in 1959 Curtis struggled to find high quality examples. He called oak savanna with intact ground layer the rarest plant community in Wisconsin. What happened? These settlers saw oak trees as a critical source of building material and fuel. Our savannas became prime real estate for towns with names like Cottage Grove and Soldiers Grove.

"We think of savanna on dry, south-facing slopes," said Doyle, "but they were originally found on all kinds of topography and moisture gradients. This emphasizes the importance of fire for savanna because we see that without fire, sugar maples dominate the wetter, heavier-soil habitats."

"Savannas are one of the most threatened communities in the state, comprising only 0.01% or about 100 acres. The DNR ranks the rarity of the approximately 100 natural community types in Wisconsin. We give a state rarity rank and a global rarity rank. Oak savanna is the only plant commu-

nity in Wisconsin listed as a G-1 (most imperiled globally) that we have in our state.”

---

## European immigrants saw savannas as a good source of fuel, and they established towns there.

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“A savanna isn’t necessarily prairie under the trees,” said Doyle. “A more wooded area can be savanna too. You want the mix.” Curtis said a savanna can range from one tree per acre to 50% canopy cover. Another metric Doyle mentioned is: less than 25% canopy cover is a prairie, 25-50% canopy is savanna, and complete cover is a woods.

At Pleasant Valley Conservancy, old aerial photos from 1937 show the hillside savanna was wide open. By the time the Brocks began in the 1980s to restore savanna there, Kathy Brock said the slope was “basically forest”.

“As opposed to densely-packed woodland trees, the most characteristic feature of savanna is the open-grown oaks,” said Doyle. “Most of them will be bur oaks.”

The corky bark of oaks, particularly bur oaks, protects the growing tissue. And oaks invest a lot of energy in their roots from day one. They can have a foot-long taproot before putting any growth above ground. A 14-foot tall, 12-year-old oak can have a taproot of 13 feet.

“You need a fire-free window for savanna to establish,” said Doyle. In *Vegetation*, Curtis mentioned that you often find fairly even-aged groves because they all established in the same time window.

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## “Oak savanna is Wisconsin’s only plant community listed as ‘most imperiled globally’.”

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“Savanna can act as a refuge for prairie plants that then move out into the broader area,” Doyle said. “It harbors a lot of diversity.” Good savanna indicator plants include woodland thistle (*Cirsium altissimum*), bottlebrush grass (*Elymus hystrix*), and silky wild rye (*Elymus villosus*). “Prairie dropseed (*Sporobolus heterolepis*), sideoats grama (*Bouteloua curtipendula*),

big bluestem (*Andropogon gerardii*) and little bluestem (*Schizachyrium scoparium*) have a photosynthetic process that makes them more adaptable to open prairie where it is dry,” Doyle said. “This little bit of shade really changes what species are adapted to these conditions, and you see it particularly in the grasses.”

Yellow false foxglove (*Aureolaria grandiflora*) is another savanna indicator. It is both a hemi-parasite and an obligate parasite — only tapping into the roots of oaks.

The Pleasant Valley Conservancy has been lovingly restored by Tom and Kathie Brock. The website, [pleasantvalleyconservancy.org](http://pleasantvalleyconservancy.org) is a wealth of savanna restoration resources: history, species lists, ecology, and management tips.

The Botanical Club brings amateur and professional botanists together to study our state’s plant biodiversity. You can learn more about this active and informative organization online by googling Botanical Club of Wisconsin.

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## “Savanna can act as a refuge for prairie plants that then move out into the broader area.”

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Doyle said he considered this summer’s class an exciting pilot project. “Micah and I saw a joint opportunity for Botanical Club members to provide more services to those interested. Perhaps in future years we can expand it.”



Photo by Denise Thornton

Oak Savanna at the Pleasant Valley Conservancy State Natural Area.



paddock at least twice, if not three or more times, through the growing season.

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## I can't speak to whether bare soil is a more general consequence of goat browsing or a function of browsing design.

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In this system, paddocks should be browsed about five days to full defoliation, rested for four to six weeks to encourage woody regrowth, and then re-browsed for about one to two days.<sup>2,3</sup> While I think of this as “rotational browsing”, in broader rangeland literature this browsing system is more commonly referred to as “management intensive grazing” or MIG.

3. One experimental practice that really resonated with me is

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Photo by Liberty Farmers, Almond WI

the recommendation to broadcast a shade-appropriate native seed mix into areas previously exposed to goat browsing. Their hoof action will help work the seeds into the soil.

One final note: In both properties I visited, I observed a fair amount of bare soil. This is likely because 1) the initial vegetation cover was already quite sparse because of the dense, shading brush; 2) legacies of historical grazing on these properties had already predisposed the site to soil exposure with renewed browsing; 3) steep slopes are prone to bare soil exposure; and, 4) open, continuous browsing and regularity of paths to forage, shade, and/or water resulted in excessive goat trampling.

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## Broadcast a native seed mix into areas exposed to goat browsing. Their hoof action will help work the seeds into the soil.

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I haven't seen rotationally browsed woodland slopes, so I can't speak to whether bare soil is a more general consequence of goat browsing or a function of browsing design (herd training and paddock layout). Regardless,

to help with vegetation cover I'd suggest broadcasting a diverse, native seed mix that matches site conditions or (what I'd recommend) choosing a temporary cover of native ryes and bromes.

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### Goat References and Resources

Launchbaugh, Karen L., Ron J. Daines and John W. Walker, editors. “Targeted Grazing: a natural approach to vegetation management and landscape enhancement.” American Sheep Industry Association (ASI), 2006.

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Nolden, Cherrie A. “Goat Dietary Selections, Performance and Browsing Effects on a Brush-Invaded Oak Savanna in Southwest Wisconsin.” 2020. UW-Madison, Master's Thesis.

<https://agroecology.wisc.edu/wp-content/uploads/sites/75/2020/03/2020-Nolden-Goat-Browsing-MS-Thesis.pdf>

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Nolden, Cherrie A. “Using Goats to Control Invasive Plants.” Southwest Badger Whole Farm Planning Workshop, 7 February 2015, Dodgeville, WI. Supplemental Handout.

[https://www.sfa-mn.org/wp-content/uploads/2020/03/nolden-using\\_goats\\_to\\_control\\_invasive\\_plants.pdf](https://www.sfa-mn.org/wp-content/uploads/2020/03/nolden-using_goats_to_control_invasive_plants.pdf)

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Other References:

Sustainable Farming Association: Ecological Services Livestock Network <https://www.sfa-mn.org/ecological-service-livestock-network/>

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hiregoats.com – for a listing of goat contractors

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goatdispatch.com – check out their video library for an overview of goat browsing

## Our Mission:

The 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.

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

Deadlines for submissions:

Winter 2021 Newsletter — November 1, 2021

Spring 2022 Newsletter — March 1, 2022

Fall 2022 Newsletter — August 15, 2022

Newsletter editor: Denise Thornton. Contact Denise at: thornton.denise@gmail.com

Drawings by Denise Thornton

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Blue Mounds Area Project Fall 2021 Newsletter

“I’m so glad I live in a world where there are Octobers.”  
— L.M. Montgomery



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