Wisconsin Entomological Society
Newsletter

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Photographing Insects for a Group

By Mike and Marcie O'Connor
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We came up with a new idea for our annual moth party event this year, and it worked so well that we thought other people might be interested.

One of the problems people always have — especially folks who have never looked at moths before — is that moths are *hard to appreciate by just looking at them* with your eyes. The colors are often subtle, and the designs tiny. So we came up with this idea — to let people see the enlarged photos as I'm taking them (Fig. 1).

Fig. 1. Photo by Wendy Johnson.

This is the recipe that we used if you'd like to try it yourself.

Ingredients:

- Two people — a photographer and a projector-operator
- A camera that writes pictures to an SD card
- An Eyefi WiFi SD card ($70 – $100)
- A laptop with a WiFi interface
- A projector, attached to the laptop
- A screen (we asked our friends if they had any hand-me-downs and wound up with three to choose from)
- Extension cords with enough plugs to power the laptop and the projector
- Two things to sit on, one for me and one for the projector

Get ready.

Setting up the camera-to-laptop connection the first time:

- Put the card in the camera and turn the camera on
- Install the EyeFi Mobi Desktop software on the laptop and launch it

- Go through the "Activate Mobi Card" steps
- Take some pictures
- Find the folder on the laptop where the pictures are being written
-

Do a trial run:

I did a couple of trial runs before the main event. The first one was just Marcie and me, while the second was a party of close bug-friends who wouldn't be cranky if the whole thing fell apart.

- Collect all the ingredients
- Set up the screen, chairs, projector, power cords, etc.
- Figure out your workflow. Mine is to open/edit the pictures on the laptop screen and then drag the picture over to the monitor screen for people to look at. So I set up the projector to be a separate monitor, rather than mirroring the laptop screen.
- Practice your workflow. Here are some useful things to learn during this practice session:
- Determine where to position the laptop in relation to the photographer. How far away can the camera go before it loses connection with the laptop?
- Note: If the camera gets too far away, it will stop transferring photos. Once it comes back within range, the photos will resume transferring — and catch up. Consider it an opportunity to take a break.
- Decide how to quickly crop/edit the photos and move them over to the projector window. Practice this a bit, in conjunction with the photographer (Fig. 2).

Fig. 2. Photo by Marcie O'Connor.

Good luck, and let us know how it works out!

The *Wisconsin Entomological Society Newsletter* is published three times per year. The newsletter is provided to encourage and facilitate the exchange of information by the membership, and to keep members informed of the activities of the organization. Members are encouraged to contribute items for inclusion in the newsletter. Please send all news items, notes, new or interesting insect records, seasonal summaries, and research reports or requests to the editor.

Tutorial for Determining Pulse Rates of Male Tree Cricket Songs

By Nancy Collins
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Tree crickets, Oecanthinae, are often identified by the male's song. Like many orthopterans, the warmer the temperature, the faster they sing. In tree crickets, this sound is produced by the stridulatory teeth on one wing passing over the stridulatory file on the other wing. The most well-known species of tree cricket is the Snowy tree cricket (*Oecanthus fultoni*). The musical chirping of the Snowy is the most popular sound effect in movies and television shows when the scene is a warm summer evening. There is even a formula that one can use to calculate the outdoor temperature. In the eastern U.S., Fahrenheit temperature can be estimated by counting the number of chirps in 13 seconds and adding 40.

Seven species of tree crickets have been confirmed in Wisconsin: Snowy, Narrow-winged, Davis', Pine, Two-spotted, Four-spotted, and Forbes'. Some chirp and some trill. The two species that consistently sing day and night in Wisconsin are Forbes' and Four-spotted. Both are trillers and prefer ground vegetation. Forbes' tends to be found on woody stemmed plants, and Four-spotted tends to prefers grassy fields and thin-stemmed plants. Forbes' has a faster rate with a buzzy sound; Four-spotted has a slower rate with a flute-like sound.

Yet, most tree crickets trill so rapidly that the human ear alone cannot decipher the individual chirps, whose rates can extend up to a hundred times or more per second. Nonetheless, the identities of these tree crickets may be determined from their pulse rates, along with a measure of the ambient temperature. Fortunately, one does not need sophisticated audio recording equipment to determine the pulse rate of a male tree cricket's song.

I first make a digital video recording of a singing tree cricket. Then, I convert it to a WAV file and open it using AVS Audio Editor software (see references below). This produces a visual image (or sonogram) of the recorded waveform. I select a portion with minimal background noise and trim it to a 1.00-second long strip (Fig. 1). The example shown is a recording of a Forbes' tree cricket singing when the temperature was 78 °F (25.5 °C). Then I count the number of pulses (or individual spikes) that occur in 1.00 seconds. In this case, the measured rate was 70 pulses per second.

Fig. 1. 1.00-second recording of Forbes'.

Finally, using a graph like that shown in Fig. 2 (containing the pulse rates as a function of temperature for various species of tree crickets), I plot the measured pulse rate on the vertical axis and the ambient temperature on the horizontal axis. The curve that most nearly matches your measurements should tell you what species of tree cricket you have been listening to.

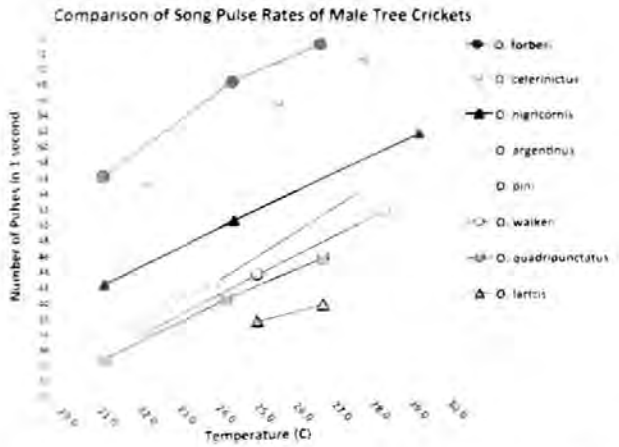

Fig. 2. Graph of pulse rates for eight species of tree crickets at given temperatures.

Graphs depicting wider ranges of pulse rates may be found on the Singing Insects of North America (SINA) website (below). You will first need to select "North American Crickets" and then "Oecanthinae tree crickets." To get to the graphs of various species, select one of the papers by T. J. Walker (1962, 1963) entitled, "The taxonomy and calling songs of United States tree crickets." You can access these articles directly on the SINA website.

References:

SINA website:
http://entomology.ifas.ufl.edu/walker/buzz/

Doremi Soft AVI to WAV Converter website: MP4kits.com

AVS Audio Editor website:
www.avs4you.com

WES Membership Dues:
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Junior Entomologists' Corner

By Sabrina Stewart

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[Editor's Note — I am happy to launch what is hoped to become a regular column devoted to the interests of younger entomologists. Sabrina Stewart, age 11, plans to write on some of her favorite insects in future issues. We thank her for her first contribution!]

As I stepped up to the mercury vapor insect light, I saw it! In the grass, at the base of the sheet, I first saw its giant head. I gasped!

I yelled, "Get the net, get the net!" I had spotted my first ever, at home, at the light, most impressive sphinx moth of my bug-collecting career! Its body was as big as my thumb! It was hairy and had yellow-orange spots. I was so excited!

My Mom said it looked like a Tomato Hornworm Sphinx Moth and then my heart sank just a bit. We'd been feeding hornworm caterpillars from our tomato plants to our chickens!

"WHAT??!! This is what they become?? Why have we been feeding them to the chickens?"

Then I realized it's because the hornworms eat all of the tomatoes and their leaves. Over the past week, we'd fed nearly a dozen, almost the size of hot dogs, to the chickens. They went crazy for them!!!

So, into the collection it goes! A giant (by my standards) tomato hornworm sphinx moth, beautiful in its own way.

Books and Websites

By Andrew Khitsun

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There is a publishing company called Forgotten Books: www.forgottenbooks.com. They specialize in reprinting books of yesteryear. There are a whole slew of books (most available either from the company directly or Amazon) on insects in general and Lepidoptera in particular. You can find books like the multi-volume **Lepidoptera Indica** and **The Lepidoptera of the British Isles, Lepidoptera of the Congo**, and **The**

Lepidoptera of Ceylon. Keep in mind that the most common customer complaint is that the books have only the text, but not the plates, contained in the original editions. But the price is only a small portion of an original's price (that is, if you can *find* an original at all).

I am happy to announce that the monumental series, **The Parnassiinae of the World**, by Weiss & Rigout, is coming to an end, with publication of Part 6. This series took 25 years to complete (wow!).

Check out **Ladybugs of Alberta: Finding the Spots and Connecting the Dots**, by J. Acorn from the Alberta Insects Series. A second book in this series is **Damselflies of Alberta: Flying Neon Toothpicks in the Grass** by the same author. The third book in this series, again by the same author, has already been mentioned, but just to round out the group: **Tiger Beetles of Alberta: Killers on the Clay, Stalkers on the Sand.**

Eye-Popping 3-D Bugs by B. Rothstein is good for introducing kids to bug-o-mania. **Grasshoppers of Florida** by J. Capinera, et al., is one of not so many grasshopper books with color photos — grab it while you can! **Whip Spiders** by P. Weygoldt opens a door into one of the least studied (since they don't have much economic, commercial or medical importance), but very interesting groups of invertebrates.

Many books on North American aquatic insects have been mentioned in this column, but let's look south, and we will see **South American Stoneflies** by B. Stark, et al. This book is from the series called ABLA (Aquatic Biodiversity of Latin America). The other books in this series are: **Ephemeroptera of South America** by E. Dominquez, et al.; **Amazon Fish Parasites** by V. Thatcher; **Neotropical Simuliidae (Diptera)** by S. Coscaron, et al.; **Neotropical Ceratopogonidae (Diptera)** by A. Borkent, et al.; and **The Blackflies of Brazil** by A. Shelley, et al.

There is a popular series, **The Insects & Arachnids of Canada**, composed of a couple dozen books, featuring invertebrates across the spectrum. Many of those are out of print and very hard to find. The website **Government of Canada Publications** at http://publications.gc.ca/site/eng/9.811273/issues.html offers most of the volumes as free PDF files for download. Also, the **Canadian Entomological Society** at: http://www.esc-sec.ca/ has a list of publications which almost matches the above mentioned, but with a few more PDFs available for

download at: http://www.esc-sec.ca/aafcmono.php. The same website has a link to the already mentioned **Canadian Journal of Arthropod Identification** at: http://cjai.biologicalsurvey.ca/ejournal.html (check your favorites, since this one has moved recently), as well as the **Canadian Entomologist** online magazine at: http://www.esc-sec.ca/journal.php (not free — you have to be a subscriber).

As for Wisconsin treats, **Geology of the Ice Age National Scenic Trail** by D. Mickelson, et al., is a great resource for those who enjoy hiking the state's trails and observing nature around them.

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Mystery Insects

By Marci Hess

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In the last edition of Mystery Insects, the grasshopper was identified by Jim Mertins as *Melanoplus bivittatus*. The *Psocodea* nymph is still in need of an ID. I realize this one may never get beyond that broad label but one never knows! If you want to check it out, color photos and additional views can be seen on WES Facebook page.

https://www.facebook.com/photo.php?fbid=10205140844074346&set=pcb.1808153196087744&type=3&theater

Mystery insects for this edition will test your ID skills of caterpillars and leafhoppers!

This Geometrid caterpillar, a.k.a. inchworm, was photographed at night on 4 May 2014. It was crawling on a standing dead tree that had lost its bark. I was photographing insects using a mercury vapor light and decided to look around the area.

This colorful leafhopper was photographed in the prairie on 24 Jun 2014. I see these beauties often but have yet to be able to confidently ID them.

If you want to check them out, color photos can also be seen on WES Facebook page (below).

https://www.facebook.com/photo.php?fbid=10205854033663640&set=pcb.1860750014161395&type=3&theater

If you would like to provide an ID on any of these insects, please contact Marci Hess: marci.hess@tds.net.

Diagnostic Lab Update:

By P. J. Liesch

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Like all summers around the UW Insect Diagnostic Lab, 2016 was busy with over 1,200 cases coming through the lab between Memorial Day and Labor Day (*out of ~2,300 cases annually*). To paraphrase Forrest Gump, *each summer is like a box of chocolates—you never know what you're gonna get.*

At certain points in the summer, some odd cases had me feeling like Fox Mulder on *The X-Files*. Along these lines, I'd describe the month of July as "myiasis month." The past few years, I'd get 1-2 reports of bot flies *per year*. Starting in July of this year, and continuing for several

weeks. I was getting reports of rabbit and rodent bot flies (*Cuterebra* sp.) *every few days.* With all the rabbit bot fly reports, it makes me think a lot differently about the name "Bugs Bunny!" Also in July, I had been contacted by a physician at a hospital in Madison about identifying some calliphorid maggots for an investigation. As a personal first, I can now officially state that I have an insect label with the statement, "*Reared from Human Foot.*"

This past summer also saw the return of some rather important garden and landscape insects in the state. The Japanese beetle, which had been quiet for a few years, has returned in force at many spots in Wisconsin; *the mild el Niño winter likely played an important role.* Another creature that had been lurking in the background for the past few years was the Gypsy Moth. What surprised me the most were the number of egg masses reported to me in mid-summer, which suggest that numbers could be even higher next year.

As is typical each year, a few "new" critters popped up in the state as well. One of these, the Japanese Weevil (sometimes called the "two-banded Japanese weevil"), showed up in a backyard in Madison. This Asian species has been in the country since the early 1900s in the mid-Atlantic states. How or why the Japanese weevil showed up this summer remains a mystery, but it sounds like this beetle has made itself right at home in Wisconsin. Reports I've read from elsewhere suggest that the Japanese weevil isn't as nasty a pest as the Japanese beetle, but it can feed on an awfully wide variety of landscape plants (especially ornamental flowers). I'll be curious to watch that one progress in the coming years.

Perhaps my most interesting case for the summer was the detection of imported fire ants in the Neenah area. To find imported fire ants, you really have to head down to places such as Texas and other Gulf Coast states. In this situation, the fire ants took up residence in the battery compartment of a freight train from Mississippi, which then came up to the Lake Winnebago area. A pest control company was called in to take care of the ants, so hopefully I won't hear of any more reports!

Speaking of Neenah, right next door in Appleton I had a number of reports of brown recluse spiders this summer. Things seemed a bit too coincidental so I got in touch with spider expert and WES member, Dr. Mike Draney, in Green Bay to see if he'd ever heard of any reports in Appleton. After connecting the dots, we realized that

all of the reports seemed to come from the same old building!

Never a dull moment around the diagnostic lab!

Unexpected Consequences: Getting More (and Something Other) Than You Expected, and Sooner!

By Jordan D. Marché II
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It was a simple idea. And it allowed me to take advantage of a unique opportunity, something that I could not have accomplished on my own. But life is full of ironies, and this one proved to be a prime example, along with demonstrating (once again) that when dealing with living organisms such as insects and their habitats, things rarely turn out to be as simple as once envisioned.

Sometime in early to mid-March 2016, workers felled a mature but likely dying shagbark hickory tree (*Carya ovata*) along an unpaved trail at the Oregon Town Park, Dane County, Wisconsin, near where I live. It was a sizeable tree, whose trunk was at least a foot or more in diameter. Cut into several major sections, its remains were then left beside the trail. When I happened upon the felled tree later in that month, I immediately saw an entomological opportunity.

For several years, I had been looking for specimens of the hickory bark beetle, *Scolytus quadrispinosus*, without success. I had even found probable larval galleries of the beetle in dead hickory limbs collected on my own property, but never an adult beetle. Unlike other species of bark beetles, they seemingly were not attracted to UV lights, nor were they found to fly in the woods around dusk. Adults were not found under the bark of older hickory logs either, so they must feed exclusively upon living trees. According to a standard reference (Blatchley and Leng, 1916, p. 589), their emergence date was usually in "June or July," which gave adequate time for larvae (if present in the tree) to mature and emerge.

Accordingly, on 30 March, I cut four two-to-three foot long limbs from upper parts of the felled hickory tree, brought them back home, enclosed them in clear plastic trash bags, and put them onto my back patio, with the hope that one or more of the bark beetles might emerge during the coming summer. But a number of other unexpected (and fascinating) insects, not to mention *ecologies*, began to reveal themselves after only a month and a half or so.

The first insect to emerge from the hickory limbs (starting on 7 May) was not a bark beetle, but a much larger weevil (ca. 4-6 mm), identified as *Magdalis barbita*, which was uniformly black or piceous, except for the scutellum, which was "densely clothed with white pubescence" (Blatchley and Leng, 1916, p. 258). This identification is also supported by the newer work of Downie and Arnett (1996, p. 1543). [It should also be mentioned here that, in another classic field guide, the key couplet and description involving *M. barbita* was erroneously *reversed* with that of *M. olyra* (Dillon and Dillon, 1972, vol. 2, p. 769).] While I had already collected one specimen *(4 June 2008)* here in Wisconsin, these weevils do not commonly appear at ground level. But quoting an entomologist named Harrington, Blatchley and Leng (1916, p. 258) noted that "[t]he larvae live in great numbers in the bark or between it and the wood of dead and felled hickories," a statement which was readily confirmed in coming weeks. This meant that I was able to acquire both male and female specimens of *M. barbita.*

As weevils continued to appear, so did another unexpected insect in moderate abundance — a parasitoid wasp (ca. 4.5 mm, starting on 18 May) in the family Braconidae, which has only one recurrent vein in the forewing. While not yet positively confirmed as such, its identity appears to be that of *Eubazus rotundiceps* (in the subfamily Helconinae). This name was provided to me by retired curator Steve Krauth (UW-Madison Department of Entomology), who located it in the *Catalogue of Hymenoptera in America North of Mexico* (Krombein, et al., 1978), as a known parasitoid of *M. barbita.* [My own attempts to identify the wasp were assisted by the key to subfamilies of Braconidae (van Achterberg, 1990) that was furnished by UW curator Craig Brabant. With one exception, involving a taxonomic feature that I could not discern (a prepectal carina appearing laterally on the mesopleuron), I could say with reasonable confidence that the wasp likely belonged to the subfamily Helconinae, and was thus probably *E. rotundiceps*.] A number of these specimens emerged in coming weeks, some of which were released, along with their (presumed) weevil hosts.

A second ecology (i.e., host-parasitoid relation) revealed itself when specimens of another braconid wasp (ca. 6.5 mm), possibly in the genus *Atanycolus*, began to emerge on 22 May and continued to appear through the end of that month. Its

probable host, the common buprestid beetle, *Agrilus otiosus*, likewise emerged, starting on 26 May. These beetles belong to the same genus as the invasive Emerald Ash Borer (*A. planipennis*), which was found to host a new domestic species of parasitoid wasp, *Atanycolus cappaerti*. Although lacking in direct proof, this is the reason why I am reasonably confident in associating the second species of braconid wasp that appeared with *Agrilus otiosus* as likely belonging to that genus and with that beetle serving as its host. No further attempt to identify the second species of braconid wasp has yet been made, however. Further macroscopic parasitoids appeared, including one specimen of an ichneumonid wasp that emerged on 22 May but whose identify has remained unknown.

On 22 June, a small moth, *Epicallima argenticinctella* (Oecophodidae), appeared in one of the bags. It had likely formed its pupa or cocoon in a bark crevice on the hickory limb, where it overwintered. Yet, the only printed account that I have found concerning that moth (Beadle and Leckie, 2012, p. 52) reports that its host plant is elm. If its caterpillar actually fed upon the hickory, and did not simply crawl onto the tree after maturing, then this occurrence seems to represent an expansion of its host range to a new tree family (the walnut family Juglandaceae vs. the elm family Ulmaceae).

Yet another ecology became evident on 17 June when an aggregation of much smaller bark beetles, *Chramesus hickoriae*, appeared on the *outside* of one of the plastic bags. They had likely chewed their way out through tiny holes not then recognized. The aggregations consisted of as many as ten to fifteen of the beetles, excitedly scrambling over one another, some occasionally 'fighting' and/or attempting to mate. Additional specimens were soon recognized inside the bags as well. Over the coming weeks, perhaps several dozen of the tiny beetles were observed, and a majority also released. Once their emergence was noted, other specimens then began to show up at a UV light in my yard at night, which constituted a new occurrence for that species.

In the meantime, a growing contingent of small to minute parasitic wasps also began to emerge, for whom it is impossible to directly associate any probable hosts, beyond the likelihood of *C. hickoriae*. Two other species of braconid wasps emerged on 3-4 June, while a species of chalcidid wasp, whose greatly enlarged hind femora are diagnostic of that family, was

collected between 30 May and 3 June. These were joined by a eupelmid wasp (27 May), eulophid wasp (3 June), and at least two species of eurytomid wasps (3-4 June), along with a small pteromalid wasp (20 June). Another tiny single wasp, having a brilliant metallic green body with red eyes and short antennae, emerged on 20 June, and has since been determined to be a eulophid (Ross Hill, BugGuide.net). A final, larger species of chalcidid wasp was collected on 24 July, after the rest of the emergence activity had subsided.

Perhaps the most significant finding concerns another, larger pteromalid wasp, ca. 5 mm., that emerged on 20 June (Fig. 1). Through the auspices of BugGuide.net, it has been recognized as an unidentified species belonging to the old-world genus *Oodera*. Its profemora are similarly enlarged and raptorial in appearance (analogous to the hind femora of the chalcidids), although their purpose remains unknown. With one exception, it had not previously been reported beyond the East Coast. A similar specimen, however, was captured in a trap several years ago by Iowa WES member M. J. Hatfield. I am again indebted to Ross Hill of BugGuide.net for processing this ID request.

Fig. 1. *Oodera* sp.

But one more 'primary' consumer was also to appear; this was a single specimen (8.5 mm) of the jewel beetle, *Chrysobothris sexsignata*, which emerged on 27 June. While dark brown above, with three weakly-marked spots on each elytron, the head and medial undersides of this beetle are metallic green. Although a recent field guide to northeastern Buprestidae (Paiero, et al., 2012, p. 292) claimed that this beetle had not previously been taken in Wisconsin, Craig Brabant has assured me that many tens of specimens are in fact contained in the WIRC, probably as a result of capture on adhesive traps deployed during surveys for the Emerald Ash Borer. A second live specimen was also collected at the Town Park, on 5 July, on an oak (?) log adjoining the felled hickory tree, thus confirming its establishment at this location.

While never accomplishing my original purpose of rearing a hickory bark beetle, this activity nonetheless revealed an unexpected diversity of species, and some probable ecological relationships among them as predators and hosts, that were all played out within these four hickory limb sections. Clearly, a great many biological and ecological processes, with potentially deadly consequences to their participants, regularly take place above our heads but which are completely unseen by us and of which we are usually unaware. I am reminded of the similarly complex relationships that I found to be occurring within the goldenrod galls that I reared several years ago.

The number of parasitoid species which emerged from the hickory limbs was clearly greater than that of their known larval or pupal hosts, leaving one to wonder what other 'primary' consumers were once beneath the bark, but from which no adults emerged. [Actually, a few specimens of psyllids were also found inside the bags but these were neither collected nor identified. So that family must contain another type of ecology that remains largely unexplored.]

This rearing activity was never rigorously designed nor carried out as a true scientific experiment. Although dates of emergence were carefully recorded, the exact numbers of each species reared were not tallied, when it became apparent that the intended hickory bark beetles would not be appearing (and indeed never did, perhaps because of the competition from other hosts and their predators). The limbs were kept in their plastic bags until 1 August, at which time the rearing was declared to be finished and they were taken out. Bark was not removed from any of the limb samples, to search for additional evidence of host-predator associations. Yet, one or more voucher specimens of just about every type of insect described herein has been donated to the Wisconsin Insect Research Collection (WIRC) at UW-Madison for future study.

A final anecdote may be noted, however, as a probable specimen of a female hickory bark beetle was taken from a pan trap at the author's residence on 16 August. It appears different enough from the smaller European elm bark beetle, *Scolytus multistriatus*, as to be the long-sought species that gave rise to this rearing experience in the first place. So perhaps a sense of closure has been attained after all.

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Brighter Prospects for Endangered Karner Blue Butterfly in Wisconsin

The Sunday, August 14, 2016 *Wisconsin State Journal* published a feature-length (& cover-page!) article by Steven Verburg, "Rare butterfly mounts comeback in Wisconsin" (pp. 1, 11), describing the remarkable increase in numbers of the Karner Blue over the past two years. While the previous six-year average for the estimated number of Karner Blues in the state was 30,380, that estimate was raised to 74,305 based upon newer 2015 data.

Jill Utrup, U.S. Fish and Wildlife Service administrator for Karner Blue programs in Wisconsin and Minnesota, was quoted as saying, "With continued habitat management going on, we are hopeful that the population will continue to spread out and grow." Wild lupine is the only food plant upon which Karner Blue larvae can mature.

The Sandhill Wildlife Area, roughly 20 miles west of Wisconsin Rapids, has seen a fifteen-fold increase in the butterfly's population since habitat restoration was begun around 20 years ago. Today, the Sandhill area accounts for about 80 percent of Wisconsin's Karner Blue population.

Fall WES Meeting:
Saturday, November 5, 11 a.m. – 4 p.m.
Room 151 in Russell Labs on the UW-Madison campus.

Join us for a day of insect fun! Show up early (or stay late) to mingle with fellow insect enthusiasts or visit the collections. Lunch will be provided around noon (Glass Nickel Pizza Co.), followed by our annual photo salon — you can enter up to five photos. After this will be "Tales from the Field" by WES members, which showcases interesting and unusual discoveries from the current field season. If you have something you'd like to share — even just a few brief words, pictures, or specimens — please do so! [E-mail Kyle or PJ.]

Directions/Parking: Russell Labs is located at 1630 Linden Drive, Madison, WI 53706. Free parking is located in the Steenbock Ramp behind Russell Labs (directly northwest).

Heading west-bound on University Avenue take the Babcock Drive exit (0.25 miles after the Charter Street intersection) and go straight through the stop sign (Linden Drive) and continue to next stop sign (Observatory Drive). Go left (west) 0.1 miles and turn left again (south) to enter the Steenbock Parking Ramp. Walk to the tall building directly to the southeast (Russell Labs) and look for signs.

Heading east-bound on University Avenue take the Old University Avenue exit (immediately after the University Bay Drive intersection). Continue 0.4 miles to Walnut Street; go left (north) for 0.3 miles to the round-about. Take the first right (east) off the round-about and continue just over 0.5 miles and turn right (south) to the Steenbock Parking Ramp. Walk to the tall building directly to the southeast (Russell Labs) and look for signs.

[Editor's Note — The following announcement concerning a grant funding opportunity was furnished by Dr. Daniel K. Young, UW-Madison Department of Entomology. WES members are urged to consider submitting an application.]

FUNDING FOR PRAIRIE RESEARCH

offered by

Prairie Biotic Research, Inc.

We Are Prairie Biotic Research (PBR) is an all-volunteer, scientific public charity established in 2000 to foster basic biotic research in prairies and savannas. One way we do this is through a competitive Small Grants Program that funds grants up to $1000 to individuals for the study of any grassland taxon anywhere in the USA. We support both natural history and experimental science. We are especially eager to support independent researchers (those lacking institutional support), but anyone having a U.S. Social Security number may apply. Since 2002, we've awarded 242 grants worth $232,076 to people in 36 states to study insects, plants, mammals, reptiles, slime molds, mycorrhizal fungi, spiders, snails, amphibians, birds, fish, invasive species, effects of management, and the human dimensions of conservation. Many of these grants supported graduate student research. We believe in the importance of collecting voucher specimens that will be carefully curated as information-rich specimens and donated to a public institution; we are not categorically against collecting specimens, as some citizen science groups are. In 2017, we expect to fund at least 18 grants of up to $1000 each with the donations we have received, including some restricted by donors for work in IA or WI.

To Apply for a Grant Visit our website (prairiebioticresearch.org) to learn more, to find our proposal form, instructions, and a sample researcher agreement form that winners of this competition must sign. Check out the history and overview files in the Small Grants section of the website to see what sorts of proposals have won funding in the past. Several winning proposals from past years are available as models on our website. Review the reports submitted by researchers of past years. Those who won funding in 2016 are ineligible for this funding in 2017, but those who won funding longer ago are welcome to submit proposals to further that same work or to support a new project. Please submit your proposal electronically as a pdf file attached to an email. We must receive your proposal via email by December 20, 2016.

Become a Supporter Please make a donation to support our work; you can now do so using Visa or Mastercard through PayPal on our website. We cannot give away money that we don't have. Any amount is welcome. PBR is volunteer-run so our overhead is very low. You may specify that your entire tax-deductible donation be given to researchers through our Small Grants Program, or to expand our research endowment that produces income we give away annually through this program. Please help us to help others!

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