Wisconsin Entomological Society
Newsletter

Volume 43, Number 2 June 2016

Snapshot: Entomologist Studying Moths at Bong

By Kevin Poirier

kpoirier@kenoshanews.com

[Editor's Note — The following article was originally published on 18 October 2015 in *The Kenosha News*. A copy was furnished by WES member Stacy Stewart. It has been reproduced with the author's permission.]

Steve Bransky has been collecting insects since the age of 8.

With a degree in entomology, he has traveled the country collecting different moth species.

Bransky, of Grayslake, Ill., is working on a moth survey at Bong State Recreational Area.

"Steve's knowledge is astounding," Bong naturalist Beth Goeppinger said. "The fact that he chose our property is amazing!"

The survey will allow the park to make better decisions about habitat management and help protect endangered species, she said.

Q. When did you get involved with Bong?

A. About two years ago. . . . The first year there was so much diversity I didn't have enough time. We felt that we needed to get out here every three to five days. We started doing that last year, and the diversity was as good as we thought it would be.

Q. Why do you need to be there that often?

A. Every three to five days the moth fauna changes. We know butterflies well; there are 70 species of butterflies in the state of Wisconsin. Moths, we estimate between 3,500 and 4,000 species. We don't know them well. Every year we are finding new species in Wisconsin that have not been found here before.

Q. What have you found at Bong?

A. Seven hundred and fifty species of moths [have been found] at Bong. We estimate there are 1,200 here. We have some that we haven't seen that we know have to be found here. They have been found not too far

away. Others are very local and rare. There are two endangered moths here at Bong. It is very important not to catch them. They only fly for five days in September. I do urge anyone getting into entomology: Be careful; do your homework; make sure you know what you are taking if you do take a specimen.

Q. What endangered moth did you find?

A. There is a plant here called prairie dock; it is the only known plant for a state-endangered moth: the *Papaipema silphii* moth. It is named after the plant, the *Silphium* plant. We found the moth here at a remnant prairie site. It is the biggest population in the state of Wisconsin. That is a big find, because if we have to re-stock it in other prairies where it has disappeared, we have a refuge here and we can (take) females and transport them and put them into new areas.

Q. Is that a lot of moths for an area like Bong?

A. It is impressive for a heavily managed, heavily used area like Bong. But as I mentioned, we have refuges set aside that are unaltered and untouched, and we are finding huge diversity in those spots. That gives them a chance to spread out years from now when we manage this prairie properly, which they do at Bong.

Q. Why did you choose moths?

A. Growing up on the north side of Chicago I had the Forest Glen Woods forest preserve near my home. The diurnal insects that occurred there were limited, and I was running out of new species to study. I found diversity at night was spectacular compared to day fliers. Back in the '70s, the silk moth cocoons were commonplace on trees around the city (not anymore). Winters were long, and I found that waiting for the moths to emerge in the spring, and the impressive size of the silk moths, always seemed more interesting.

Q. Why are moths important?

A. Moths are our No. 1 pollinator by far, above the honeybees. Honeybees don't belong here. They are not natives. They were brought here in the 1650s. Our native plants don't rely on honeybees. They rely on moths, butterflies and other bees such as bumble bees, which are native. A lot of times, we'll catch these moths that have pollen on their entire body; some of the prairie (plants) rely on sphinx moths or hawk moths. So without the moths, some of these flowers can't survive.

Q. What challenges do they face?

A. Moths are disappearing everywhere. We have a lot of problems with non-native insects. The forest service brought in a parasite fly (*Compsilara concinnata*) to control gypsy moths. We find it here in Wisconsin, but it was never even released here. It was released in New York and New Jersey, and it escaped and is traveling around the U.S. like wildfire. It is killing all the moths. *Bacillus thuringiensis* spray, we use for gypsy moth, via helicopter, it kills every moth. It is not just gypsy moth, but without the tree, we don't have the moths, so we have to find that fine happy medium line that is best for control to keep everything happy.

Q. Anything that people can do to help the moths?

A. Yeah, if you have a spot, a native prairie in your yard, try to maintain it as native prairie. Try to limit your burn to small isolated patches. It is not good for the moths. If you have a bigger prairie, that is not touched, not burnt, manage it by hand. Pull the weeds by hand, but try not to burn a spot. Keep it as refuge; that will help the moths.

Keep your white lights down to an orange light, or something that doesn't attract them. It makes it easier for bats to come find them as prey.

Q. Anything you would say to people interested in entomology?

A. We have the Wisconsin Entomological Society; we have a website, www.wisentsoc.org. I urge anybody who wants to get into it or has any questions, please send us an email through the website. We are a very interactive group; we do events four times a year through the University of Wisconsin-Madison. We urge anybody who is interested to send us an email and we'll get back to you. We'd love to have you out and teach you more.

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.

2016 dues notices were sent out in January. Please note that the year through which dues are paid appears on the newsletter's mailing label after your name.

Membership Dues:

Individual or family: $10 per year

Sustaining: $15 per year

Patron: $25 per year

Please make checks payable to WES and send to: Les Ferge, Treasurer, 7119 Hubbard Avenue, Middleton, WI 53562-3231. lesferge@gmail.com

Please report any address changes to the Treasurer.

Books and Websites

By Andrew Khitsun

akhitsun@tds.net

Moths, Myths, and Mosquitoes: The Eccentric Life of Harrison G. Dyar, Jr. by M. Epstein is self-explanatory – it's about one of the most influential 20th century American entomologists.

An entire series exists dealing with insects in Florida: **Arthropods of Florida and Neighboring Land Areas**. This includes **Lepidoptera of Florida, Widow Spiders of Florida, Scarab Beetles of Florida, Ichneumonidae of Florida, Sand Flies of Florida** and many others – totaling 18 volumes. Most can be found on Bioquip or Amazon, but the .pdf versions can be downloaded from the Florida Department of Agriculture and Consumer Services at: http://www.freshfromflorida.com/Divisions-Offices/Plant-Industry/Florida-State-Collection-of-Arthropods/FSCA-Publication-Archive/Arthropods-of-Florida-and-Neighboring-Land-Areas.

Checklist of the Oxypeltidae, Vesperidae, Disteniidae and Cerambycidae, (Coleoptera) of the Western Hemisphere, 2016 version by Larry Bezark, is available from BioQuip. While several books were mentioned in this column that treat insect consumption as a weird phenomenon, **Insects as Sustainable Food Ingredients** by Aaron Dossey explores the possibility of mass-production of insect-based foods in the future.

The Sting of the Wild by Justin O. Schmidt is one of the most amazing books out there. This entomologist used himself to produce the Schmidt Sting Pain Index, having been stung more than 2,500 times by 83 species of insects! **Lyme Disease: Why It's Spreading, How It Makes You Sick, and What to Do About It** by Alan G. Barbour is a very timely book to all outdoors persons (everyone reading this, pretty much), since the disease has turned out to be much more prevalent and common than previously thought.

More dragonfly books! Check out **A Field Guide to the Damselflies & Dragonflies of Arizona and Sonora** by Rich Bailowitz, et al. and **Dragonflies of the Greater Southwest: Arizona,**

California, Colorado, New Mexico, Nevada, Utah by Kathy Biggs.

Bernard d'Abrera's **Butterflies of the Neotropical Region 1. Papilionidae & Pieridae** is going to see its second edition in June of this year. The book should be completely revised according to today's taxonomic knowledge that has changed significantly in the 33 years since the first edition was released. While on the butterfly subject, the **Witt Catalogue: A Taxonomic Atlas of Eurasian and North African Noctuoidea** in 8 volumes is a good investment if you have extra cash and are interested in this group of moths.

The nascent website **InsectIdentification.org for the casual observer** at (you guessed it): http://www.insectidentification.org/ helps novices and the more experienced alike to "nail down" many a species of unknown bugs in their collections. Another new website is our neighbor, located in Russell Labs at UW-Madison: **Insect Ambassadors**: http://labs.russell.wisc.edu/insectambassadors/insect-websites/. Be aware that the site is "buggy" – pun intended – lots of dead links and such, but I hope that those are just "teething" problems.

Finally, **Field Guide to Wisconsin Streams: Plants, Fishes, Invertebrates, Amphibians, and Reptiles** by M. Miller describes 1,000 species of critters inhabiting some 84,000 miles of Wisconsin waterways.

Wisconsin Entomological Society Officers:

President: Kyle Johnson
UW-Madison
1630 Linden Drive
Madison, WI 53706
kejohnson4@wisc.edu

Vice-President: Patrick (PJ) Liesch
UW-Madison
1630 Linden Drive, Room 246
Madison, WI 53706
pliesch@wisc.edu

Secretary-Treasurer: Les Ferge
7119 Hubbard Avenue
Middleton, WI 53562-3231
lesferge@gmail.com

Newsletter Editor: Jordan D. Marché II
5415 Lost Woods Court
Oregon, WI 53575
jdmarcheii@gmail.com

Mystery Insects

By Marci Hess

marci.hess@tds.net

Mystery insects for this edition will test your ID skills of grasshoppers and *Psocodea* nymphs!

The grasshopper came to my blacklight on 04 Jul. 2014. The *Psocodea* nymph was found in my woods in Lafayette County on 28 Aug. 2014. Even if you don't know the ID of these two, if you have any ID tips for these types of insects, the information will be much appreciated. Color photos of both can be found on the WES Facebook page. Click on the link below, which will take you to the *Psocodea* nymph; you'll need to click thru the gallery to see the grasshopper pictures.
https://www.facebook.com/photo.php?fbid=10205140844074346&set=pcb.1808153196087744&type=3&theater

In the last edition of Mystery Insects, the lygaeid was identified by Ilona Loser as *Mesovelia mulsanti.* The other hemipteran is still in need of an ID. 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=10204401829279438&set=pcb.1754032071499857&type=3&theater

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

Buckets of Beetles

By P. J. Liesch
pliesch@wisc.edu

I'm sure many readers will relate to this phenomenon: *as entomologists (and naturalists in general), everyday tasks sometimes end up taking much longer than expected due to fascinating biological distractions.*

I was recently mowing the lawn over Memorial Day weekend. As I was mowing the front yard near the sidewalk, I stumbled upon a single stag beetle. As an entomologist I felt obligated to pick it up to make a closer examination. Typically, I run into stag beetles a few times each year and

they're usually the large, reddish brown stag beetle, *Lucanus capreolus*. The beetle I found was a bit smaller, darker, and lacked the bicolored legs of *L. capreolus*. After a beverage break and some Internet browsing, I figured I must have been looking at the closely related *Lucanus placidus*. Interesting, I thought, and placed the stag beetle back on a portion of the lawn that had already been mowed, lest it face the wrath of a metallic tornado.

Another pass or two with the mower and I spotted a few more stag beetles. I was no longer simply stumbling upon these beetles—*something else must be going on.* Once again, I stopped mowing to take a closer peek in the taller grass, only to find even more stag beetles. Within the span of five minutes, I found nearly forty stag beetles in my front lawn near a low spot where a tree must have previously stood. As with the earlier beetle, I gently collected and relocated these individuals to a previously mowed area. As sundown wasn't too far off, I rushed to finish mowing in the dwindling light.

Around 10:30 p.m., I wandered back outside with a flashlight to see what the beetle situation looked like—*and boy, was I ever in for a surprise*! It was astonishing to see the sheer numbers of stag beetles present in a single spot at a given time. In an attempt to count them, I starting placing them into an empty flower pot. The forty I had spotted earlier seemed like a drop in the bucket—*quite literally!* The bucket was nearly full to the brim with 250 beetles, and I eventually stopped counting. I'd estimate that I spotted nearly 400 stag beetles in a single night.

I did eventually confirm that the species of stag beetle in my lawn was *Lucanus placidus*. In the literature it's mentioned that aggregations have been noticed in lawns on occasion. In Kriska and Young's "Annotated Checklist of Wisconsin Scarabaeoidea" (2002), an aggregation of 15 males and females was once noted beneath a black oak tree in the state. I'm not entirely sure what kind of tree used to occupy the low spot in my front lawn, but the stag beetles obviously loved it. As an interesting side note, the same low spot was also home to the "Dead Man's Fingers" fungus (*Xylaria polymorpha*), another biological curiosity in its own right. It's amazing what

you can find in your own back yard or front lawn if you take the time to look!

New Records of Shining Flower Beetles (Coleoptera: Phalacridae) from Wisconsin

By Jordan D. Marché II
jdmarcheii@gmail.com

Over the past few years or more, as a part of general collecting, I've encountered several species of phalacrid beetles for which previous records in Wisconsin were absent. This relatively small family of beetles is quite distinctive in size and shape, and not difficult to recognize. They are usually between 1 and 3 mm long, shiny, elongate-oval, convex above and flat beneath. Their colors range from black to piceous to brownish, and most have at least one fine line or striation beside the elytral suture. Some have paler elytral apices. Most commonly, they are encountered on flowers, especially blooms of goldenrod (*Solidago* spp.), in the late summer to early autumn. Other species, however, can be found in the spring, usually starting in the month of May.

This report briefly describes four species in three genera that previously had not been formally identified from Wisconsin (Wisconsin Insect Research Collection (WIRC): Family Phalacridae). As such, all constitute **new state records**, although in the first case, specimens were almost certainly collected by others long beforehand, but were simply not determined to species. UW-Madison insect diagnostician Patrick J. Liesch has expressed the opinion that Phalacridae "seems to be one of those families that everyone seems to be happy to get to family level, but they don't seem to go much further with ID's" (Liesch, e-mail message to author, 11 Feb. 2016). In fact, these identifications are not that difficult to make, and there seem not to have been any major revisions to genera or species since the publication of Downie & Arnett (1996). The species IDs below (in boldface) have all been confirmed by P. J. Liesch (memo to author, 5 May 2016). They are currently housed in the author's private collection (JDMC).

Olibrus semistriatus Leconte is one of the most commonly found species of phalacrids, and ranges in size from just under 2 to 2.4 mm. Its color is usually piceous to dark brown. In addition to the sutural striation, a second striation, slightly farther away from the first than its own spacing from the suture, and with both appearing strongest on the apical half of the elytra, is readily seen under a microscope.

On occasion, additional very faint or incomplete striae are also noted beyond the second primary striation. These are shown in the habitus drawing, Fig. 95, p. 226, of White (1983). Two Wisconsin specimens that I collected were taken on the Glacial Drumlin Trail, between Cottage Grove and Deerfield, Dane Co., on 29 September 2001 and more recently at Honey Hill Preserve, Oregon, Dane Co., 30 July 2011. I have also collected specimens of this species in Connecticut, Michigan, and Indiana. This species is slightly smaller than, and not as elongated as, *Olibrus pallipes* Say, which reaches ca. 3.0 mm.

The next two species, ***Acylomus ergoti*** Casey and ***A. piceous*** Casey, are each about the same size (2 mm or slightly less), and have only a single sutural striation which is visible on the apical third of the elytra. Both species are blackish or piceous. They may be readily told apart, however, by shape. *A. ergoti* is elongate-oval, in the form of a near-perfect ellipse, while *A. piceous* has more tapered elytra, whose ends form more of a V-shape or parabola.

I have taken four specimens of *A. ergoti* in Wisconsin between 1998 and 2015. The first was acquired at the author's former residence on Burr Oak Avenue, Oregon, on 21 June 1998. A second specimen was collected at the intersection of County Hwy. OK and Route 11, Green County, on 12 June 2010, either on flowers or by sweeping vegetation. A third specimen came from the Bud Jackson School Forest [a.k.a. the 'school woods'], near Verona, Dane County, on 8 June 2012, and the last was taken at the author's current residence on 31 August 2015, coming to a blacklight. Only one specimen of *A. piceous* has yet been taken by me in Wisconsin, on 15 September 2012, and which also came to a blacklight. But I collected a second specimen on 21 August 2005 in Pennsylvania (Berks County), either on flowers or swept from vegetation.

The last (and smallest) species discussed herein is ***Phalacrus illini*** Casey, which measures ca. 1.3 mm and is more roundish and blackish or piceous. It too has but a single sutural striation on each elytron. According to Downie and Arnett (1996, p. 1026), it was known only from Illinois; hence the name. Along with its reduced size, it may be recognized as a member of the genus *Phalacrus* by its antennal insertion being concealed from above by a frontal ridge. Thus, it would look like a smaller version of the more common Smut Beetle, *P. politus* Melsheimer, which exceeds 2 mm in length. To date, one specimen of *P. illini* was collected by me from Wisconsin on 19

May 2012 at the Ice Age National Scenic Trail, Brooklyn Unit, near the Dane/Green County line; it was beaten from an apple tree. This species has likely been overlooked beforehand on account of its small size. But another specimen was taken by me in Pennsylvania (Berks County), on 7 May 2008, alongside a creek from either flowers or vegetation. That itself might constitute another new state record, but I have not pursued that possibility.

It is hoped that other Wisconsin entomologists may devote further attention to this family of beetles and that additional specimens of their kind may be collected from around the state and identified.

REFERENCES

Downie, N. M.; Arnett, R. H., Jr. 1996. "Family 88. Phalacridae. The Shining Flower Beetles." In *The Beetles of Northeastern North America*. Gainesville, FL: Sandhill Crane Press, 1025–1029. Vol. 2.

White, R. E. 1983. *A Field Guide to the Beetles of North America* [Peterson Field Guide Series]. Boston, MA: Houghton Mifflin. 368 pp.

Wisconsin Insect Research Collection (WIRC); Family Phalacridae: http://www.entomology.wisc.edu/irc/coleopte/phalacri.html (last accessed 17 May 2016).

Regal Fritillaries in the 4th of July Butterfly Counts

By Ann B. Swengel
aswengel@jvlnet.com

In response to the U.S. Fish and Wildlife Service comment period last fall on Regal Fritillary status and trend, my husband Scott Swengel decided to see what the 4th of July Butterfly Count data revealed on this topic. You can read the results of his analysis in the journal *Scientifica* in this article:
"Status and Trend of Regal Fritillary (*Speyeria idalia*) (Lepidoptera: Nymphalidae) in the 4th of July Butterfly Count Program in 1977-2014."

This full-text publication is freely available on the Internet at: http://www.hindawi.com/journals/scientifica/2016/2572056/.

Count data support what other sources have also indicated that this butterfly has contracted in range, with all records east of Illinois coming from the first

half of the study period. The overall rarity of the species is indicated by only 6% of counts in the range ever reporting the species. Even as the count program gained much greater coverage in the second half of the study period, all measures of Regal Fritillary occurrence and abundance declined during this period, including in the core range. These results again confirm what other sources have indicated, but provide quantitative range-wide documentation. As a result, even though these findings are not positive, I hope that you feel encouraged about the value of butterfly counting to provide comprehensive answers to what's happening with butterflies.

LSRWA Bioblitz, 11 June 2016

By Susan M. Lehnhardt, Senior Ecologist
susan@appliedeco.com

The Lower Sugar River Watershed Association (LSRWA) is planning another all-day bioblitz on the Judy Douglas property on Saturday, June 11. WES officers and members are encouraged to attend and participate. Last year, Steve Bransky set up his lights and feeding stations and led a group of young students to interpret what was visiting his stations. His participation in the bioblitz was a real hit! The property to be studied lies on the Sugar River floodplain and has abundant backwater oxbow lake settings, along with other habitats. If you would like to do insect collecting and/or help with identifications, then we would like you to assist us! For more details about the event, please contact me by e-mail or phone at the address below. You may also check out our website:
http://www.lsrwa.org/events/2016/06

Thank you!

Applied Ecological Services, Inc.
17921 Smith Road
Brodhead, WI 53520
608.897.8641 x1020

"OUCH!"

By Linda W. Curtis
http://www.cutistothethird.com

One of my friends is an emergency room nurse at the local hospital. I asked her if she knew of any insect-caused problems and she answered, "Oh yes! Why, just this week . . ." and related an incident of someone sitting on a caterpillar with stinging hairs. Not life threatening, but certainly uncomfortable and embarrassing to

explain why he preferred standing to sitting for a few days.

Turns out, I discovered the same culprit, a saddleback caterpillar, *Acharia stimulea,* on a twig and carried it home to image it under the digital microscope (below).

After imaging, an information search revealed that the stiff hairs were natural hypodermic needles with venom glands at the base. Stinging hairs are one thing, while poisonous hairs are another and a serious rash and nausea can follow.

Mimicry works for caterpillars with spines or bristles that are not harmful if predators avoid them. The buckeye caterpillar, *Junonia coenia,* looks menacing, but is not. The adult stage also has a "startle effect" with eyespots on the wings.

On the other hand, the saddleback caterpillar has a rather ordinary gray-winged adult moth that serves as a camouflage, blending it into the tree trunk texture. That function is more "not seen, not eaten" instead of "watch out!"

Reminder: WES Summer 2016 Meeting

Join us at spectacular **Perrot State Park** on **Sunday, July 31st** for a day (or more) of insect fun!

The indoor meeting will be held from 1 to 4 p.m. in the park's nature center, will feature several talks, and offers the chance to mingle with fellow insect enthusiasts.

If you would like to contribute a talk, then please e-mail Kyle Johnson or PJ Liesch. Afterwards, we will head to Sullivan's Supper Club for dinner.

Field activities range from casual enjoyment of the park by day to all-night blacklighting.

Further details, including GPS coordinates of the nature center, were given in the Spring 2016 *WES Newsletter*. We hope to see you there!

[**Editor's Note** — The following article (ESA position statement) was kindly furnished by Dr. Daniel K. Young, UW-Madison Department of Entomology.]

3 Park Place, Suite 307
Annapolis, MD 21401-3722 USA

Phone 301 731 4535
Fax 301 731 4538

esa@entsoc.org
www.entsoc.org

ESA Position Statement on the Importance of Entomological Collections

Approved on January 11, 2016
Valid through January 11, 2020

The Entomological Society of America (ESA) and its members recognize the value of entomological collections and the staff that maintain them as a rich source of specimens and data for modern research and an irreplaceable historical reference for all of entomological science. It is of vital importance to current and future life scientists that we implement protections for these irreplaceable resources, upon which the bulk of our scientific knowledge relies.

Of the estimated 3 billion specimens housed in biological collections worldwide, approximately 500 million are preserved in U.S. and Canadian entomological collections at government agencies, universities, and in public museums and private collections. The costs of preparing, curating, maintaining, and providing access to these collections are relatively low compared to the devastating impact not doing so would have on the global scientific community. The significant historical investment in collections that established America's scientific leadership in the biological sciences is at risk, and our reputation and competitive edge in the biological sciences could diminish if steps are not taken to ensure the future of this natural resource through continued or increased funding at all levels.

Benefits of Entomological Collections

- **Rapid identification of costly invasive pests that affect agriculture, forestry, and human and animal health**, which can arrive from anywhere in the world, is only achievable with access to a global reference collection for comparison, as is determination of their potential biological control agents. Invasive insect and mite pests can have tremendous economic impacts (estimated at nearly $33 billion dollars annually in the U.S. due to crop losses and mitigation costs) and profound ecological effects across large parts of the country. Staff at land-grant universities train the next generation of entomologists and provide diagnostic services, yet they face nearly constant pressure to justify the resources and space to maintain these collections, which are vital to performing these functions.
- **Collections are a rich source of research and an essential reference** for all other scientific disciplines, providing a basic vocabulary (taxonomy) and organizational system (classification) to effectively communicate about biology across geopolitical, cultural, and language barriers. Preserved collections represent potential samples for future research using new

analytical methods and technologies, allowing us to study them in ways not yet conceived. Increased digitization efforts are making specimens and their associated data from collections globally accessible. Modern collections include tissue and DNA libraries (*e.g.*, Global Genome Initiative, Barcode of Life), providing additional avenues for research but requiring new expertise as well. Living research collections (*e.g.*, the Drosophila Species Stock Center) provide invaluable materials to many other fields such as genetics, medicine, ecology, cellular and developmental biology, physiology and neurobiology.

- **Natural history collections are the only places where the world's natural heritage is preserved** in perpetuity for future generations to study and enjoy, yet these collections find themselves under the same level of threat as the natural resources they seek to document. Specimens in natural history collections represent a vast library of accumulated scientific knowledge about the natural world, organized in a systematic manner that allows for retrieval, study and education.
- **Living arthropod exhibit collections** are critical for educating the public about biodiversity and the ecological importance of arthropods. They also function as an important resource for the conservation and recovery of endangered and threatened species such as the Lord Howe Island Stick insect, brought back from the brink of extinction thanks to rearing efforts at the Melbourne Zoo. These living collections play an important role in raising public awareness, yet the cost and the expertise to maintain them place them in jeopardy.
- **Collections offer a lens into the past, a snapshot of the present, and a means for predicting the future**, particularly with regards to how planetary biodiversity has changed and continues to change in response to global shifts in climate and land use. The size, scope and breadth of entomological collections provide a wealth of data for answering important biological and ecological questions at environmental and evolutionary scales, in addition to serving as one of the most reliable sources of data for recognizing endangered and threatened species and guiding conservation efforts. Entomological collections also serve as repositories for voucher specimens (specimens deposited as a record of what species were involved in any particular study) from all entomological scientific endeavors, enabling confirmation and validation of previous work (reproducibility being one of the basic tenets of science).

Challenges

Despite these many contributions, funding cuts, collections staff reductions, and insufficient training of future taxonomists endanger both collections and the expertise required to care for and use them. Mission-critical scientific infrastructure–particularly in the areas of agriculture, human and veterinary health, conservation, and biodiversity–rely upon these resources. The unfortunate results of this system-wide attrition of staff are reduced access for research, longer loan processing times, delayed response to inquiries, loss of diagnostic services, and closing of selected parts or entire collections when no staff are available to support them.

Natural history collections are not static cabinets of curiosities but are dynamic centers of research. They continue to grow and evolve as curatorial expertise changes over time, as new questions arise and new methods are developed to address them, and as opportunities to explore previously understudied areas improve our understanding of our planet's biodiversity.

Recommendations

ESA strongly advocates for new or revised policies and increased funding that will result in:

- employment of additional well-trained collections staff to support existing collections
- more opportunities for training in collections management for existing collections staff
- support to improve facilities and infrastructure to maintain collections and capitalize on opportunities for expansion as needs and expertise change
- the development of new analytical methods and technological advances that further our ability to gain new knowledge through the study of specimens housed in collections
- improved funding for resources that result in greater physical and virtual accessibility of collections and the data contained therein
- increased public awareness regarding the importance of collections to science and society as a whole and more opportunities to engage the public through citizen science initiatives

The Entomological Society of America is the largest organization in the world serving the professional and scientific needs of entomologists and people in related disciplines. Founded in 1889, ESA today has more than 7,000 members worldwide affiliated with educational institutions, health agencies, private industry, and government. Members, many of whom utilize collections directly or indirectly but all of whom understand their importance, include researchers, teachers, extension educators, administrators, marketing representatives, research technicians, consultants, students, and hobbyists. For more information, visit http://www.entsoc.org.

For a list of useful references pertaining to the importance of collections, visit http://www.entsoc.org/scipol/background-entomological-collections.