

# The Maine Entomologist

A forum for students, professionals and amateurs  
in the Pine Tree State

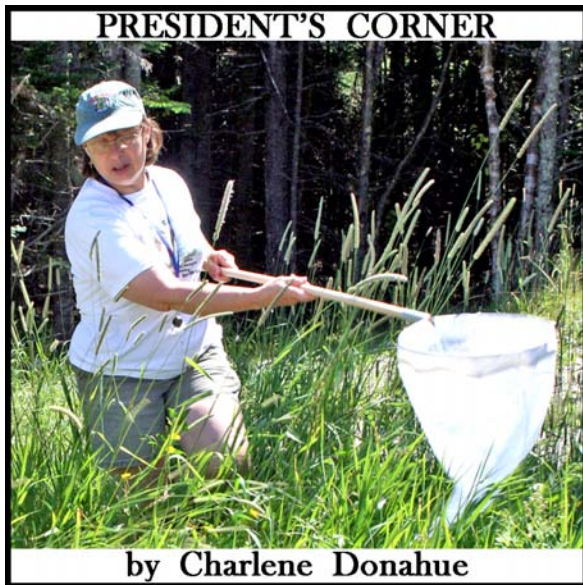
The Official Newsletter of the Maine Entomological Society

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## PRESIDENT'S CORNER



by Charlene Donahue

I have been retired for two months now and am as busy as ever, just with a different emphasis on what and when I do things. Besides spending more time with family and friends and outside, I am still involved in a number of entomological endeavors. One is as an adjunct curator at the Maine State Museum. This is a good time to have more time as there are a number of entomological donations coming in to the museum that need attention. It looks like there will be a number of different opportunities for MES members to help with the collection and some people have already started helping.

There was an article in the February MES Newsletter about finding the winter moth (*Operophtera brumata*) parasitoid *Cratichneumon culex* in Maine. There are a lot of questions about this wasp and its relationship to the winter moth. I am collaborating with UMass on research this spring, looking into some of these questions and seeing if I can find the wasps at more locations where winter moth are prevalent.

This summer I have offered to run a number of traps for various projects. For the past four years I have run a spruce budworm (*Choristoneura fumiferana*) trap at my camp in T4 R7 WELS, monitoring the numbers of this native pest of fir and spruce. I will continue running the trap – it's always good to have an excuse to go to camp.

Hilary Morin, University of Maine graduate, discovered a new Pteromalid wasp, *Omocerus dirigoius* while studying winter moth parasitoids back in 2015. There are not very many specimens of the wasp so I am going to see if I can catch a few more this summer as Hilary has moved on to graduate school in Pennsylvania.

The US Forest Service has been studying the bark beetles and wood borers that came in after a tornado hit the Scientific Management Area of Baxter State Park in 2013. They found what appears to be a Western bark beetle species of *Pityokteines* (see p. 11-12) and would like to collect more specimens to confirm its presence in Maine, and to see if it is in any other locations than just the park. So, I will probably be running one of those traps at my camp as well.

So trapping will be one way to get me out and about – go down to the coast, check a trap, take a hike with the dog... go up to camp, check a trap... Plus some colleagues have expressed interest in coming to Maine and “helping” out.

Hope to see you all at a field day or elsewhere this summer!

## Call for Entomologists!

The Friends of Sears Island and Dirigo Learning will be holding an insect-centric mini-bioblitz on **Saturday, June 2nd** from 1:00-3:00 p.m. as part of Midcoast Bee Week 2018. The event is designed to engage children and families in activities that will help them learn about native pollinators, as well as other non-pollinating insects that inhabit Sears Island.

Entomologists are needed to help *generally* identify insects collected on the island (it is not necessary to collect specimens for further examination and species-specific identification). For more information about the event or to volunteer your entomological skills, contact Robin Huntley at [dirigolearning@gmail.com](mailto:dirigolearning@gmail.com).

## Table of contents

- Notes on Overwintering Monarchs (p. 2)
- Is *New Hampshire* the center of the leafhopper universe? (p. 4)
- MESO / MES Day in Orono (p. 7)
- Not From Your Granny's Attic! (p. 8)
- June Field Day at Moosehorn NWR, Baring (p. 8)
- July Field Day in T4 R7 WELS (p. 9)
- Collecting Results in Katahdin Woods & Waters National Monument, 2017 (p. 9)
- Update on Maine State Museum Insects (p. 11)
- Trapping Assistance Requested (p. 11)
- Insect Tracks & Signs Walk (p. 12)
- New FREE children's beetle book (p. 12)

**PLEASE see the M.E.S. web page**  
(<http://www.colby.edu/MES>) for information on the May 12th Field Day in Benton, and the Maine Bumblebee Atlas Training Sessions!

## Notes on the Status of Wintering Monarchs in Mexico (2017-2018): Unexpected Results.

By Robert E. Gobeil and Rose Marie F. Gobeil



Monarch (*Danaus plexippus*), Wells, Maine (York County), July 20, 2016, Photo by Rose Marie F. Gobeil.

As part of a project at the Wells Reserve at Laudholm (Wells, ME) to produce a checklist and brochure of common butterflies found at the Reserve, we did extensive surveying of butterflies at the Reserve over a two-year period (2016-2017). Since the Wells Reserve is located in a coastal area with expansive open fields with hundreds of milkweed plants, we were especially interested in the Monarch population (Fig. 1).



Fig. 1. View of large, open fields with milkweed plants at the Wells Reserve at Laudholm, Wells, Maine (York County), July 20, 2016. Photo by Rose Marie F. Gobeil.

During the summer of 2017, we saw our first Monarch (1) of the season on June 8th which is a very early record for the state of Maine. According to the Maine Butterfly Survey (MBS), there are only a few Monarch sightings for late May and early June (deMaynadier et al., 2018). On June 28th, we recorded 16 Monarchs; again, a high count for June. By July 19th, the population of Monarchs continued to increase and we counted over 50 Monarchs at the Reserve. Compared to other sites with high volumes of milkweed plants where we

have conducted similar surveys, the numbers of Monarchs at the Reserve were extremely high for summer counts (Gobeil and Gobeil 2014b). Since we had already done a survey of the Reserve in the fall of 2016, no other surveys were conducted in the fall of 2017. Based on our early sightings in 2017, the Monarch population was at a high level and it looked like it would be a good breeding season and it was!

This was confirmed in late summer of 2017 when the Wells Reserve carried out its yearly Monarch egg and caterpillar rescue project. In order to maintain open field habitats and to prevent the spread of invasive plants, selected fields are mowed at the Reserve in late summer (Kahn, 2017). During this project, rescuers locate Monarch caterpillars and eggs and move them to fields that will not be mowed. Since 2010, a total of seven rescues have been conducted (Fig. 2). When compared to other years, the 2017 rescue was a banner year for Monarchs with the highest number of eggs ever found. A total of 210 eggs and 30 caterpillars were moved to other fields. This clearly indicated that the Monarch had a great breeding season. The previous high was 90 eggs found in 2012 while the lowest season was in 2014 when no eggs or caterpillars were rescued. Prospects for a high wintering population in Mexico looked great.

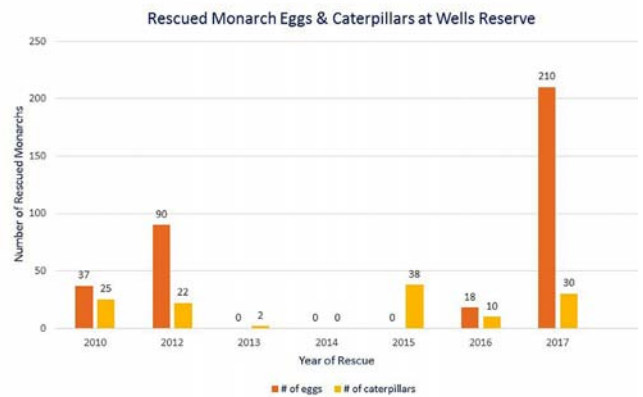


Fig. 2. Chart showing rescued Monarch eggs and caterpillars at the Wells Reserve at Laudholm, Wells, Maine (York County). Courtesy of Suzanne Kahn, Wells Reserve.

When the migration began in the fall of 2017, reports of high numbers of migrating Monarchs started to come in across the U.S. On Sept. 29th and 30th at Cape May, NJ, a favorite location to see Monarchs in the fall, up to 700 Monarchs were recorded per hour flying over the dunes. These were the highest counts since 2012 (Howard, 2017). On October 10th, between 9:00 a.m. and 2:00 p.m., around 35,000 Monarchs were counted on the barrier beach at Fort Tilden, Queens, New York. A local observer indicated that it reminded him of huge flights he saw in the late 1970s (Riepe 2017; Trezza 2018). Similar results were also recorded in Canada. On Sept. 21st, thousands of Monarchs were observed feeding on goldenrod and asters on the shores of Lake Ontario (Howard 2017).

As the fall flight progressed and gained momentum, however, observers at key migration points in the U.S. and Canada started to observe an unusual pattern of migration. They noticed that the migration tended to be about two weeks

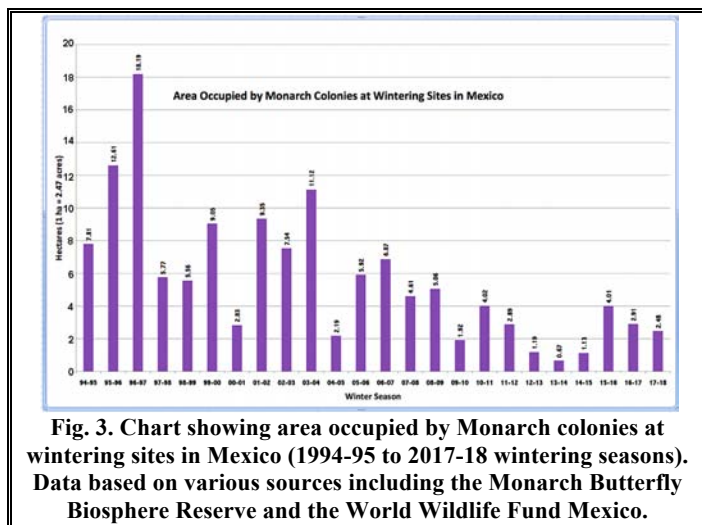
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### Overwintering Monarchs (cont.)

behind schedule. Chip Taylor, Director of the Monarch Watch organization which tracks Monarch migration each fall called it “the latest fall migration since Monarch Watch began tracking in 1992” (Trezza 2018). Even at Thanksgiving, Monarchs were still migrating at Cape May with little chance of ever making it to Mexico that late in the season. Still, due to the high numbers of Monarchs seen migrating south, expectations of a higher wintering population in Mexico continued to circulate in the media.

With great anticipation, in early March (2018), the Mexican government released information on the size of the wintering population in Mexico (WWF, 2018). With such a strong fall migration along the migratory flyway routes, Monarch numbers were expected to be higher than in recent years. Unexpectedly, only nine colonies were located and the population size decreased by 14.77% compared to last winter (Fig. 3). The Monarchs only occupied a total area of 2.48 hectares (roughly 6.12 acres).

What happened? Many factors can influence the Monarch migration. It appears, however, that unusually warm temperatures and four major hurricanes with strong winds during the fall migration may have caused the delay in the movement of Monarchs southward. According to the National Oceanic and Atmospheric Administration, 2017 was the third warmest year in 123 years of record-keeping in the U.S. and all five warmest years on record have occurred since 2006 (NOAA 2018). Even though Monarchs had an excellent breeding season and high numbers were seen migrating, many of them apparently never made it to Mexico. Since the migration was delayed by unusual weather conditions, many of the Monarchs probably did not have time to reach Mexico before colder temperatures set in. Expectations of higher numbers on the wintering grounds did not materialize.



**Fig. 3. Chart showing area occupied by Monarch colonies at wintering sites in Mexico (1994-95 to 2017-18 wintering seasons). Data based on various sources including the Monarch Butterfly Biosphere Reserve and the World Wildlife Fund Mexico.**

The Xerces Society (2018) also recently released information on the status of the western population of Monarchs wintering in California. They found that even though more Monarch wintering sites were located last winter, the population dropped to a five-year low. The wintering population was estimated at 200,000 Monarchs which continues a long-term decline in the population, similar to what is occurring in overwintering populations in Mexico.

The highest count was in 1997 when 1.2 million Monarchs were recorded. Researchers at the Society indicate that unseasonably warm temperatures, wildfires with associated smoke, and mudslides may have impacted the late season migration. Similar to findings in the eastern portion of the U.S., the Xerces Society received many reports of late season breeding.

As we previously discussed in several articles on the Monarch published in MES newsletters, there are many factors involved in the decline of the Monarch population (Gobeil and Gobeil, 2014a; 2016). We continue, however, to believe that the main threat to the Monarch is the dramatic change in climate which will affect the species even more in the future. Global warming with more severe and extreme weather conditions will continue to impact Monarch populations not only in the U.S. but especially on the wintering grounds in Mexico when the Monarchs are concentrated in a very small area. Only time will tell us what happens to this beloved species easily recognized by most people by its large size, bright colors, and admired for its intriguing yearly migration.

### Acknowledgements

We wish to thank Susan Bickford and Scott Richardson for granting us permission to conduct the butterfly surveys at the Wells Reserve at Laudholm. We also wish to thank Suzanne Kahn, Education Director at the Wells National Estuarine Research Reserve for allowing us to use the chart showing the number of rescued Monarch eggs and caterpillars at the Wells Reserve.

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## Overwintering Monarchs (cont.)

Trezza, J. 2018. Monarch butterfly migration was off this year and researchers are worried. (Online)  
[https://www.washingtonpost.com/national/health-science/monarch-butterfly-migration-was-off-this-year-and-researchers-are-worried/2018/01/19/177555f2-f65a-11e7-beb6-c8d48830c54d\\_story.html?utm\\_term=.febb8d8cccd8](https://www.washingtonpost.com/national/health-science/monarch-butterfly-migration-was-off-this-year-and-researchers-are-worried/2018/01/19/177555f2-f65a-11e7-beb6-c8d48830c54d_story.html?utm_term=.febb8d8cccd8) [Accessed 25 March 2018].

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## Is New Hampshire the Center of the Leafhopper Universe? by Don Chandler

When you think about the most biodiverse families of insects in North America, you probably would suspect the winner would be the hyperdiverse beetle families Staphylinidae (rove beetles) or Curculionidae (weevils), or you may assume that the statements on the dominance of Ichneumonidae (ichneumon wasps) or Braconidae (braconid wasps) are correct, but which always fade away due to the lack of taxonomic support in describing and/or identifying members of these families for any state.

The winner for the secret “Biodiversity Champion of New England” contest comes from a somewhat surprising group, the hemipteran group Auchenorrhyncha (treehoppers, leafhoppers, planthoppers). The culmination of 30 years of sampling in New Hampshire has produced the grand total of 605 species of Cicadellidae (leafhoppers) for the state [Chandler & Hamilton, 2017, Trans. Amer. Ent Soc. 143 (4): 773-971], clearly surpassing the next largest family documented in the UNH Insect Collection, the Staphylinidae (rove beetles, 548 species). If anyone has bothered to compile a county list, Strafford County with 468 species documented (and resident county for UNH), would surely be in the running (Fig. 1).

Leafhoppers are a wonderful group to study, in that there are well-known and effective sampling protocols, and they have a well-established published infrastructure (revisions, keys) that will allow the identification of species. Leafhoppers have been studied due to their importance as obligate plant-feeding economic pests, and more recently due to recognition of their role in the transmission of phytoplasmas (cell wall-less bacteria) such as Aster Yellows and X-Disease. They are really an enjoyable group to work with - the genera are usually easily identified based on features of their external appearance, and many of the genera have species with distinctive color patterns or other external features that allow ready placement (Figs. 2-4).

However, while the means to place most individuals to species are present, there is the small caveat that you must often be willing to perform genitalic dissections (hundreds!) in order to do so. In order to sample your backyard or local

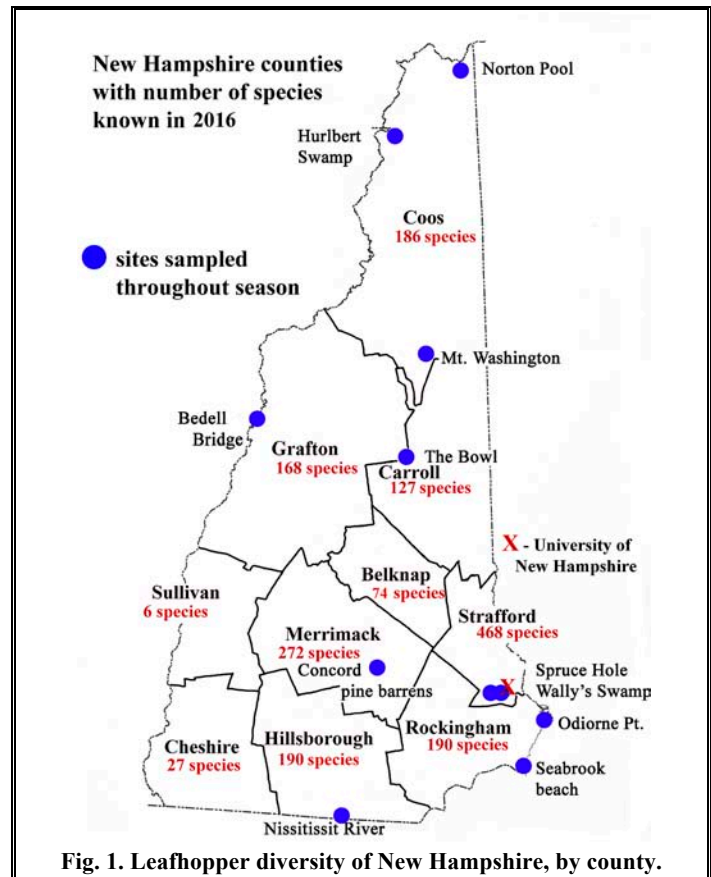


Fig. 1. Leafhopper diversity of New Hampshire, by county.

area thoroughly, you should sweep/sample from all of the different plants around and throughout the season (May to October) to ensure that the seasonal changes in species activity can be systematically represented.

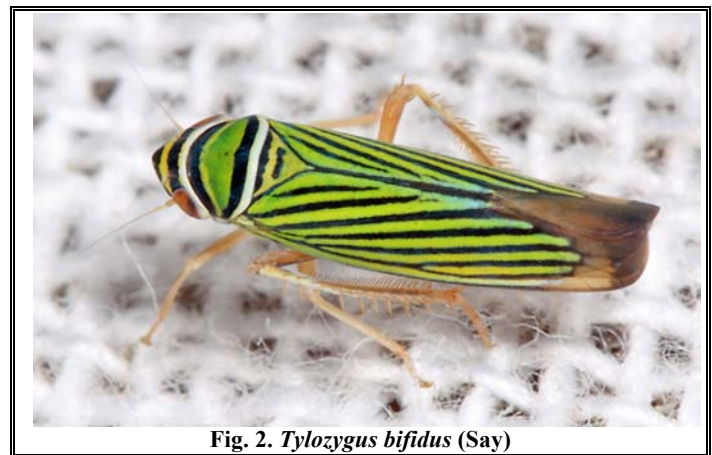


Fig. 2. *Tylozygus bifidus* (Say)

Documenting diversity beyond that of a local area takes time - years. The leafhopper fauna of New Hampshire was first targeted by Philip Lowry (1933) who found 237 species, mainly from our small Seacoast Region and the White Mountain area. Thanks to projects funded by the NH Agricultural Experiment Station (AES) from 1981-1993, eleven unique and/or natural areas at diverse areas of the state (Fig. 1) were intensively sampled throughout their seasons, which provided a vast array of species that are documented at <http://insectcoll.unh.edu>.

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*New Hampshire Leafhoppers (cont.)*



**Fig. 3. *Eratoneura ardens* (McAtee)**



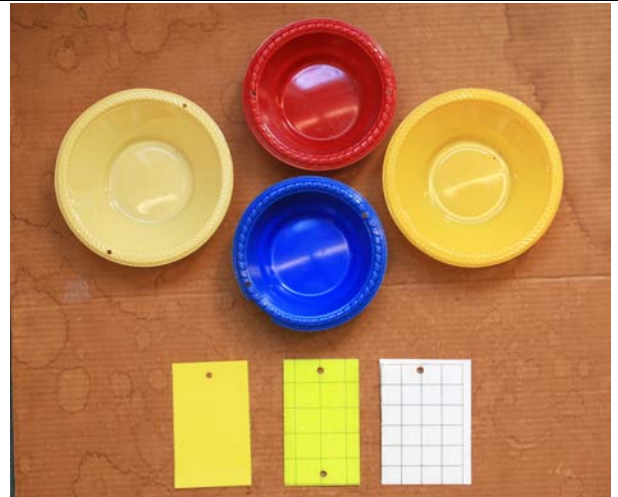
**Fig. 4. *Evacanthus orbitalis* Fitch**

A more recent AES project focused on the leafhoppers associated with farms that are organic or are managed by IPM [Integrated Pest Management], to determine abundances of the pest species and the most effective means of sampling to document their presence and abundances. At the end of this last project, the total number of species known from the state was 605, with 287 being new NH state records (8 new Maine records are also provided), 14 new species are described [figure of *Empoasca murrayi* provided], and a European pest species, *Empoasca vitis* (Göethe), “the smaller green leafhopper” was found on native grapes, for a new North American record.

For sampling protocols, sweeping is the typical means by which leafhoppers are sampled. While there are polyphagous species that specialize on grasses, or on herbaceous plants, or on woody plants, most typically feed and/or breed on one to several closely-related species in a plant genus or group of genera, or for some species they target the available local species or genera of a specific plant family. However, for crop surveys sweeping may not be desirable as it can damage flowers or fruit formation, and some species feed on grass crowns or roots at the ground level, which are impossible to effectively sweep. Ultra-violet light traps work well in attracting some species, but far from all. Recently developed

sampling techniques focus on differently colored pan and sticky traps.

The color commonly used for pans and “stickies” is a bright yellow that reflects in the same visual range as do actively growing plants. It has been documented by a number of studies that not all leafhopper species are attracted to yellow. For the study conducted in agricultural areas we used three colors of stickies (bright yellow, yellow-green, and white, and three colors of pan traps (bright yellow, red, blue, and at a few sites whitish-yellow) (Fig. 5) in a standard protocol at all sites.



**Fig. 5. Pan traps and stickies used in the standard protocol.**

The pan traps were placed on the ground with a saturated salt solution used as a preservative in the bowls, while the sticky traps were either hung from branches in trees or supported by a metal clip that was inserted into the ground. Traps were out from mid-June to mid-August, with pan trap samples being serviced every two weeks, and sticky traps were replaced once a month. Fifty sweep samples (Fig. 6) were taken in two areas at each site every two weeks when the pan traps were serviced. Data from all sites were pooled by collection technique for each species taken to evaluate overall success.



**Fig. 6. Morgan Dube assisted in the sweeping for hoppers.**

The comparative data produced indicated that sweeping was the most productive in terms of species (129 of 166 species), but was the least productive in terms of total

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### New Hampshire Leafhoppers (cont.)

abundance (4825 out of 22,944 specimens). Pan traps picked up 78 species, and sticky traps 86 species, with stickies being the winner for most specimens taken, 10,727. Sweeping generated the largest number of singletons, 41, more than twice that produced by the other techniques.

Each technique produced species not taken by the others. Bright yellow was the overall winner in terms of being the most attractive to the most species, but for some species green-yellow was superior, and particularly for ground-level feeders blue or red was strikingly superior to yellow and green-yellow. Stratification of species in their flight and feeding activities was commonly seen, with those feeding in trees and shrubs rarely being taken by traps at ground level, and vice versa. Some species were clearly best sampled by sweeping, and didn't exhibit any obvious preference for colors.

All of these data drive home a common finding for biodiversity studies - you must use multiple collecting techniques in order to produce the most complete survey of a fauna, and a commonly used collecting technique/color may not work for a specific species that you are studying.

Presence of such a large number of species produces the question: "Why are there so many leafhopper species in New Hampshire?" Is New Hampshire truly the center of North American leafhopper diversity? It is unlikely. There is no reason why Maine or Illinois wouldn't have just as many or more species. New Hampshire and Maine were essentially scraped clear by the glaciers of 10,000+ years ago, and our current flora and fauna are all "recent" immigrants. Precinctive species are rare - there is a single leafhopper species (*Psammotettix alexanderi*) that is known only from the state, and which is found in the alpine area of the Presidential Range. Perhaps it is a glacial relict that also occurs on Mt. Katahdin? Maybe.

Though small, New Hampshire is a very diverse state physiographically, with the Presidential Range dividing the state into a northern boreal forest area, and a southern mixed deciduous/ coniferous forest area, including many plant species of the Mid-Atlantic and Midwest Regions. In particular the southern portion of the state has a mosaic of wet areas (bogs, swamps, marshes [brackish and freshwater], and riparian areas of streams and rivers) intermixed with xeric glacial outwash plains and eskers. These drier habitats are particularly rich in leafhopper species associated with dry-adapted plant species: oaks, hickories, and grasses, along with the various understory shrubs associated with the trees. Here the greatest number of leafhopper species may be found - typically 140 species or more. None of these species are unique to New Hampshire - supporting the explanation that New Hampshire's high diversity is at least in part due to a lack of targeted sampling in adjacent states.

Still, New Hampshire is surprisingly diverse. In comparison with the Plains States (think Kansas), the range of habitats is extreme and will therefore support a maximally diverse fauna. Canada in its entirety has 1088 species (Maw et al., 2000) while being over 100,000 times larger than New Hampshire (Fig. 7) - New Hampshire has a species count that is 56% of that found in the much larger Canada.

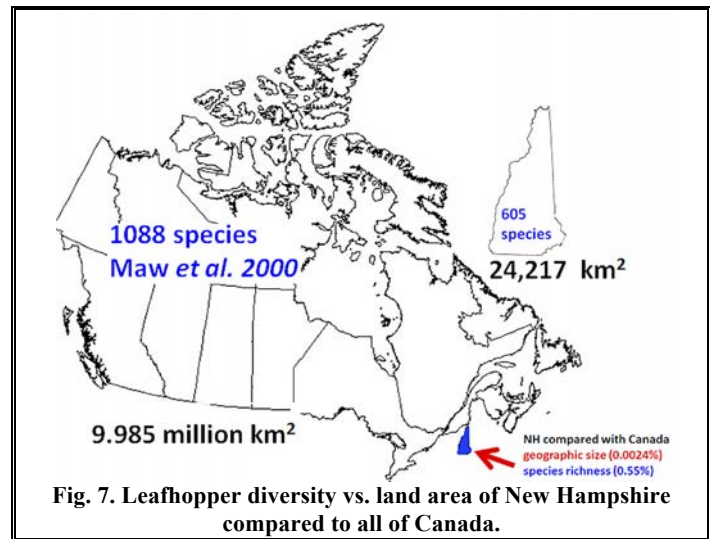


Fig. 7. Leafhopper diversity vs. land area of New Hampshire compared to all of Canada.

The Latitudinal Diversity Gradient can explain this disparity to some extent. New Hampshire shares comparable latitudes with only the southernmost portion of Ontario, with both being completely glaciated during the last glaciation event. Southern Ontario has been heavily farmed and is elevationally monotonous, leaving very little in the way of natural areas where historic floral diversity could be maintained. If leafhoppers species richness decreases with increasing latitudes, then a sharp drop-off in diversity over much of Canada should be expected as sampling progresses to the north.

Another factor potentially producing high diversity in New Hampshire is based on the seasonal summer movement of small leafhoppers and many other arthropods ("aerial plankton") to New Hampshire (and Maine!) due to the prevailing winds and storm fronts that move from the southern states to the Northeast/New England Regions. This has been well-documented for pest species such as *Empoasca fabae* (potato leafhopper) and *Macrostelus quadrilineatus* (aster leafhopper). But discovery of single individuals in late summer of species such as *Idona minuenda* (the avocado leafhopper), *Erythridula cuneata* (feeds on persimmon), *Erythridula normanti* (feeds on possum haw), far from the range of their normal hosts, is strongly suggestive that chance aerial dispersal adds to the species count for the state.

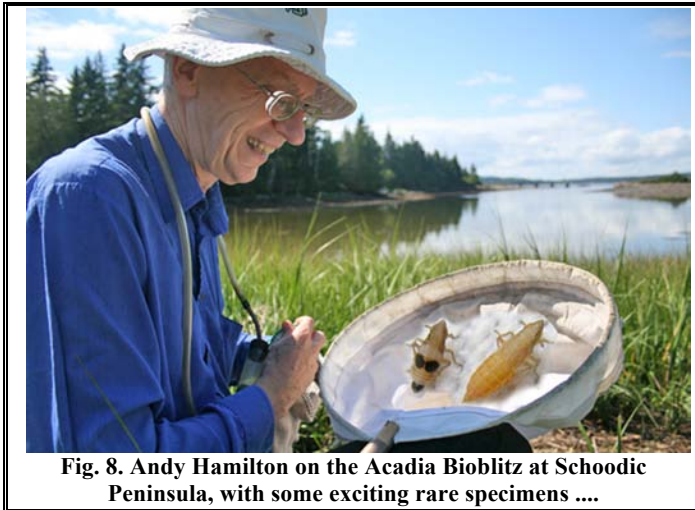
In conclusion, the spectacular diversity of New Hampshire leafhoppers is due to: 1) systematic sampling of different habitats and the targeting of plant species using several different sampling protocols; 2) the great physiographic diversity of an otherwise small state that provides many different floral associations; and 3) the contribution of seasonal migration of aerial plankton each summer.

Other states in the same latitudinal range are expected to have a similar range of diversity, as many of the host plant species or their close relatives are present. If so, the leafhoppers will be there also, and Maine should have a similar species count. For those entomologists that love natural history, leafhoppers provide a wonderful opportunity to document plant-insect associations, learn how to identify

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*New Hampshire Leafhoppers (cont.)*

plants, learn how to identify leafhoppers (did I mention the need to dissect male genitalia? BUT there are many keys with illustrations). They don't bite or sting, and sampling is best done on warm, sunny days with no wind. How could you pass that up? See if you can surpass the count of 139 leafhopper species from my yard!



**Fig. 8. Andy Hamilton on the Acadia Bioblitz at Schoodic Peninsula, with some exciting rare specimens ....**

This study would never have been initiated without the encouragement and participation of Andy Hamilton, Agriculture Canada, Ottawa (Fig. 8), here marveling at the genetically modified individuals of *Tumidagena* found at an Acadia National Park BioBlitz.

- **Don Chandler, Dept. of Biological Sciences, University of New Hampshire, Durham, NH 03824.**

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**The MESO/MES Day April 21st  
 by Charlene Donahue**

The MESO/MES Day April 21st at the University of Maine was great. Seven University of Maine graduate and undergraduate students presented their research projects, answered questions and toured us through their research labs and greenhouse.

It was interesting the varied projects they are working on. I was impressed with the quality of their work and their presentations. It was also good to connect MES members with the students and research being done in Maine. Eight MES members attended along with some of their family members. Pete Darling brought his teenage granddaughter Madison along and it looks like we may well have another entomologist in the making.

After lunch we worked on sorting through the teaching collection that had not had any attention in years. There is still a lot of work to do sorting identifying specimens, and it was a good project for a cold and cloudy day. Hopefully we will be able to get up the University another day to help again.



**There was plenty of sorting to be done of insect specimens used in the University of Maine teaching collections, both those used in the introductory class and in more advanced training.  
 - Bob Nelson photo**

Below is a list of students who are currently working on entomology research at the University of Maine.

- Brandon Boxler:** Monarch Butterfly (*Danaus plexippus*) Roost Site-Selection and Viability East of the Appalachian Mountains
- William Aman:** Insect Communities of Orono Bog walk and Bangor City Forest
- Jonas Insinga:** The Influence of Drought on Potential Insect Vectors and the Transmission of Potato Blackleg Disease.
- Alex Baron:** Response of Green Peach Aphids to Potato Plants Infected with *Dickeya dianthicola*
- Nick Baron:** Effects of Host Vegetation on Cannibalism in the Colorado Potato Beetle
- Jason Rose:** Suitability of Substrate Inhabited by Black Soldier Flies to Green Bottle Flies
- Megan Hess:** Using Larval Dragonflies as Biosentinels to Detect Methylmercury Production Zones near Cranberry Operations in the Black River Watershed
- Spencer DeBrock:** Effects of the Hemlock Woolly Adelgid on Abundance and Nymphal Infection Prevalence of Black-legged Tick
- Sara Mcride:** Habitat Association of Ticks and Tick-borne Disease Transmission
- Patrick Erbland:** Accumulation of Omega-3 Fatty Acids in the Tissues of Black Soldier Flies, *Hermetia illucens*
- Joshua Villazana:** Development of Black Soldier Fly *Hermetia illucens* (L.) (Diptera: Stratiomyidae) Under Different Environmental Conditions and Interactions with Other Fly Species
- Christine Conte:** The effects of Timber Harvest in Lyme Disease Transmission
- Karla Boyd:** The Diversity and Abundance of Natural Enemies of The Browntail Moth in Maine
- Chase Gagne:** Hydrology and Aquatic Invertebrate Communities of Riverine Rock Pools: Effects of Seasonality and the Penobscot River

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## Not Your Granny's Attic (probably)

by Kathy Claerr

Unless your great grandmother had a penchant for insects, I doubt you've ever seen anything like it. The Maine State Museum just inherited a Lepidoptera collection unlike *any* seen before by at least three experienced MES members. Thanks to the thoughtful assessment of the University of Maine, Orono, entomology teaching assistants, the State Museum now houses a stunning, century-old collection by one K. M. Gray. Sadly, there is no accompanying information about this collector. Nonetheless, the collection is something to behold.



Just one of the boxes of beautifully spread lepidopterans in glass cases, mounted a century ago by K. M. Gray, that came to MFS from the University of Maine.

- Charlene Donahue photo

The hundreds of specimens languished in the teaching collection at the University because of limited usefulness in the laboratory classroom. Karla Boyd and Chase Gagne realized that the specimens might be of historical interest, if not ecological value, because most specimens have dates and locations. They wisely offered them to the Museum where most of the rest of the University insect collection resides. Adjunct Curator Charlene Donahue gladly accepted the donation on behalf of the Museum.

The specimens arrived in five unassuming cardboard boxes. Opening the flaps of one box, you are treated to a panoramic spread of perhaps 50 small (3/4 inch and smaller) lepidopterans, fully spread out, and preserved safely in miniature glass boxes. Yes, glass. And on two sides! The accompanying photograph suggests the vision, but what an impact first-hand! You are simply gob-smacked, staring slack-jawed at the beauty laid out inside that box. Honest. On further inspection you realize that the double-paned boxes allow the observer to clearly and safely inspect both sides of the specimen. There's no chance of rubbing off wing scales or breaking an antenna. Larger specimens, both North American

and tropical are included. None of us beholding the collection in late April had ever seen such a preservation method.

We hope to figure out some way of displaying some of these apparently rare mounts at MES events. The observer must be able to access both sides of each specimen while viewing in order to highlight the unusual, painstaking preservation method. The current idea is to create a small, rotating table-top rack. If you have any metalworking or carpentry skills, or alternate display ideas, we would like to hear from you! Or if you can track down K. M. Gray (perhaps a University of Maine alumna or alumnus?), let us know!



Dana Michaud examines one of the larger butterflies in the glass-cased Gray collection from U.M.O.

-Charlene Donahue photo

## June 9th Field Day in Moosehorn National Wildlife Refuge – Baring Unit

On Saturday, June 9, join us at Moosehorn National Wildlife Refuge, Baring Division (Washington County). We'll meet at Refuge Headquarters at 103 Headquarters Road, Baring, Maine, at 10:00 a.m.

There is tremendous diversity here in the Refuge in this northern corner of the state, with woods, meadows including blueberries, railroad tracks, accessible swamps, and an abandoned gravel pit all within a half-mile of a building for our headquarters with restrooms, chairs and tables for lunch and recapping. This is also a short distance from Calais, with motels, Subway, McDonalds, Dunkin Donuts, etc. People may well wish to stay overnight in Calais to avoid a long drive prior to, or following, a day of collecting.

To get here, take U. S. Route 1 to Baring, which will be just before you get to Calais, coming from the south. About 1.25 miles beyond Downeast Glass (which will be on your left), turn right onto Charlotte Road. Take this 2.4 miles to the south, and turn right on Headquarters Road. Take this to the parking lot at the Refuge Headquarters - at 45 deg. 06.870'N, 67 deg. 16.851'W.

You can download a pdf map from the M.E.S. web site (<http://www.colby.edu/MES>) to see precisely where this

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**June Field Day in Baring (cont.)**

is. You can also download a pdf map of the Baring Division of the Refuge from the M.E.S. web site.

Fred Gralenski is coordinating this event. Please do let him know (via e-mail at [gralf1@wildblue.net](mailto:gralf1@wildblue.net)) if you're expecting to come, to help with his planning.

As with all such ventures, a species list of the taxa collected should be provided to Fred so he can forward the information on to Refuge personnel.

\* \* \* \* \*

**T4 R7 WELS MES Field Day  
Saturday, July 14, 2018**

**Charlene Donahue ([donahuecp15@gmail.com](mailto:donahuecp15@gmail.com);  
207-485-0960) Staying at camp on Friday  
Bob Nelson ([BeetleBob2003@gmail.com](mailto:BeetleBob2003@gmail.com);  
207-426-9629) Meeting in Sherman on Saturday**

The MES July field day will be on Saturday, July 14th in T4 R7 WELS. We hope to obtain a Special Use Permit to collect in the Katahdin Woods and Waters Monument but there are plenty of other interesting habitats outside the Monument as well. There is the Sebois River and aquatic collecting, gravel pits, open area, mixed forestlands, beaver flowages, bogs, ponds etc.

The roads in this area are rugged logging roads, and while 4WD may not be necessary, high ground clearance is a must. Bring all your regular collecting gear and personal supplies, including a rain parka if there's any forecast for thundershowers, as well as food and PLENTY of water. A compass would be a good idea if you go off trail or out of sight of the road.

Because this area is more remote than most of our field events, we will have two gathering places. The first will be at the Irving gas station in Sherman. Bob Nelson ([BeetleBob2003@gmail.com](mailto:BeetleBob2003@gmail.com); 207-426-9629) will be coordinating this group. Note that Bob Nelson does not have a cell phone, so once he leaves his home on Friday morning, you won't be able to reach him. The second will be at Charlene Donahue's camp in T4 R7 WELS (more on this later).

Whichever option you choose, we need to know by Thursday, July 12th who is coming – so you don't get left behind! We also will need to know ASAP if you change your mind and will NOT be joining us, so we don't wait for you!

Those wanting to meet at the Irving station in Sherman should be there by 10:00 a.m. on Saturday morning. To get to Sherman, take I-95 northbound and get off at Exit 264. Turn left at the end of the offramp, drive beneath the Interstate, and the gas station will be right there in front of you. The station also has a quick-stop store inside; there is a diner in a Shell gas station on the opposite side of the Interstate, about 1/3 mile to the south. People wanting to go up the night before and/or stay Saturday night can contact the Katahdin Valley Motel (207-365-4554) ASAP (because they can fill up quickly!), which is right next door to the gas station. Those desiring to camp out or stay elsewhere probably already know more about the area than we could recommend.

To get to the MES starting point in the KWWNM: from the Irving take Route 11 North 4.7 miles, turn left onto Sherman Lumber Road (after school on corner). Stay on the main road for 12.5 miles to the Sebois River, park on the far side. We'll meet up with Charlene Donahue and her group there at ~10:30 a.m.

Charlene Donahue owns a remote camp on Peaked Mountain Pond in T4 R7 WELS near the KW&W Monument. It is 19 miles off the main road, has no electricity or running water but yes, there is an outhouse with a view. If people would like to stay there they are welcome. There is a bunk room that sleeps six laid out side by side like cordwood on two double bunks and an upper double bunk. There's also a couch and a saggy camp bed on the porch. There is tent space outside as well as a nearby MFS remote campsite. You can swim in the pond, fish and use the canoe. We can go 'bugging' right there and process specimens in the camp. Bring your own bedding, food and water. There is a gas stove and lights and dishes.

Charlene will be going up Friday morning, so if you want to stay Friday night you probably should go in with her because: 1) it is not always easy to be on the correct logging road; and 2) they are actively logging on this road system and may be hauling at that time, so it will be safer to go together. She also has a CB radio to communicate with the trucks to maximize safety.

Please let Charlene know by Thursday, July 12th if you would like to stay in or at her camp either Friday or Saturday night, or both. Call her with any questions at 207-485-0960 or email [donahuecp15@gmail.com](mailto:donahuecp15@gmail.com). Note that there is NO cell-phone coverage in this area!

For more information on the KWWNM go to <https://www.nps.gov/kaww/learn/management.htm>; you can also download a high-resolution recreation map there by clicking on the link for "maps."

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**Katahdin Woods and Waters 2017 Field Day  
Results – Not too Shabby for a "Bad" Day!  
by Charlene Donahue**

Last year we had the Katahdin Woods and Waters National Monument MES Field Day on Saturday, August 19th. It was a fun time – collecting was not stellar but the weekend was a grand success. Seven MES members spent the weekend in the area: Bob Nelson stayed at the motel in Sherman and the other six roughed it at Charlene's remote camp in T4 R7 WELS.

The weather was primarily wet – either raining or so humid nothing dried out, making collecting in most habitats difficult. We ended up doing our most successful collecting outside the Monument proper. On Saturday, this was near Whetstone bridge, along the river bank and in the woods and fields nearby. Additional collecting was along the road with the Monument on one side and working forest on the other.

One of the best finds of the weekend was off the dock in Peaked Mountain Pond where Dana Michaud scooped up three species of water striders with one of the them, *Rheumatobates rileyi*, being uncommon!!! All three were new to the Maine Forest Service collection.

*(continued on next page)*

**Insects and Spiders found in T3 R7 WELS, Maine on August 19, 2017, included:**

Spiders (Araneae)  
Salticidae  
*Eris militaris* (Bronze jumping spider)  
Beetles (Coleoptera)  
Cantharidae (soldier beetles)  
*Chauliognathus pensylvanicus* (Goldenrod soldier beetle)  
Carabidae (ground beetles)  
*Agonum extensicollis*  
*Bembidion nigrum*  
*Bembidion planum*  
*Bembidion semistriatum*  
*Bembidion versicolor*  
*Brachinus medius* (Bombardier beetle)  
*Chlaenius cordicollis*  
*Cicindela* sp. (tiger beetle)  
*Elaphropus saturatus*  
*Elaphropus tripunctatus*  
*Harpalus fallax*  
*Harpalus herbivagus*  
*Pterostichus mutus*  
*Pterostichus tristis*  
*Schizogenius lineolatus*  
*Synuchus impunctatus*  
Chrysomelidae (leaf beetles)  
Alticinae (flea beetles)  
*Galerucella nymphaeae* (water lily beetle)  
other species  
Coccinellidae (ladybird beetles)  
*Coccinella trifasciata perplexa* (three-banded lady beetle)  
Elateridae (click beetles)  
*Athes* sp.  
Gyrinidae (whirlygig beetles)  
*Dineutus* sp.  
Lampyridae (fireflies)  
*Ellychnia corrusca* (winter firefly)  
Mycetophagidae (hairy fungus beetles)  
*Litargus tetraspilotus*  
Scarabaeidae: Cetoniinae (fruit and flower chafers)  
*Trichiotinus assimilis*  
Staphylinidae (rove beetles)  
*Lordithon* sp.  
Paederinae, genus indet.  
*Stenus* sp.  
Diptera (true flies)  
Ephydriidae (shore flies)  
*Hydrellia* sp.  
Muscidae (house flies)  
*Musca* sp.  
Sciomyzidae (marsh flies)  
genus indet.  
Syrphidae (hover flies)  
*Eristalis dimidiata*  
*Sericomyia militaris*  
*Spilomyia sayi*  
genus indet.  
Tabanidae (deer flies, horse flies)  
*Chrysops sackeni*  
*Chrysops univittatus*  
*Chrysops vittatus*  
Tachinidae (tachinid flies)  
*Tashina* sp.  
Tipulidae (crane flies)

*Tipula furca*  
Hemiptera  
Achilidae (plant hoppers)  
genus indet.  
Cercopidae (psyllids)  
genus indet.  
Cicadellidae (leaf hoppers)  
*Graphocephala teliformis* (Scarlet-green Leafhopper)  
general indet.  
Cicadidae (cicadas)  
*Neotibicen canicularis* (dog-day cicada)  
Gerridae (water striders)  
*Gerris* sp.  
Lygaeidae (seed bugs)  
genus indet.  
Miridae (plant bugs)  
*Monaclocaris americanus*  
*Stenodema vicinum*  
Nabidae (damselfly bugs)  
*Nabis* sp.  
Pentatomidae (stink bugs)  
*Cosmopepla lintneriana* (twice-stabbed stink bug)  
Veliidae (smaller water striders)  
*Rhagovelia obesa*  
Hymenoptera (ants, bees, wasps)  
Apidae (bumblebees and honeybees)  
*Bombus impatiens* (common Eastern bumble bee)  
*Bombus ternarius* (tri-colored bumble bee)  
Braconidae (parasitic wasps)  
genus indet.  
Formicidae (ants)  
at least 3 spp.  
Ichneumonidae (parasitic wasps)  
*Ichneumon* sp.  
genus indet.  
Sphecidae (thread-waisted wasps)  
genus indet.  
Tenthredinidae (common sawflies)  
*Fenusella nana* (early birch leaf edgeminer)  
Lepidoptera (butterflies and moths)  
Crambidae (grass moths)  
*Fumibotys fumalis* (mint root borer)  
Erebidae  
*Lophocampa caryae* (hickory tussock moth)  
Gracillariidae  
*Phyllocnistis populiella* (common aspen leaf miner)  
Nymphalidae (brush-footed butterflies)  
*Boloria selene* (silver-bordered fritillary)  
*Speyeria atlantis* (Atlantis fritillary)  
*Speyeria cybele* (great spangled fritillary)  
Pyrilidae (snout moths)  
genus indet.  
Sesiidae (clearwing moths)  
*sesia tibiale* (American hornet moth)  
Odonata  
Coenagrionidae (pond damselflies)  
*Enallagma exsulans* (stream bluet)  
Orthoptera  
Acrididae (short-horned grasshoppers)  
*Melanoplus bivittatus* (two-striped grasshopper)  
Psocoptera (barklice, booklice)  
Psocodae (common barklice)  
genus indet.

(continued on next page)

2017 KWWNM Field Day (cont.)

**Insects and Spiders found in Soldiertown Twp., Maine on August 19, 2017, included**

- Coleoptera (beetles)
  - Carabidae (ground beetles)
    - Bembidion nigrum*
    - Bembidion versicolor*
    - Chlaenius sericeus*
    - Elaphrus californicus*
    - Anisodactylus rusticus*
    - Elaphropus anceps*
    - Notiobia terminatus*
    - Selenophorus gagatinus*

**Insects and Spiders found in T4 R7 WELS, Maine on August 19, 2017**

- Hemiptera (true bugs)
  - Gerridae (water striders)
    - Metrobates hesperius*
    - Rheumatobates rileyi*

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**Updates on the Maine State Museum (MSM)**

**Insect Collection**

by Charlene Donahue

This winter Paula Work, MSM zoology curator, and Philip deMaynadier, Maine Inland Fisheries & Wildlife (IF&W) biologist, signed a Memorandum of Understanding, in which it was agreed that insects collected for IF&W projects (such as the current Bumble Bee Atlas) would be deposited at the MSM. The IF&W purchased an insect cabinet in anticipation of the additions to the collection.

Last month Paula received a call letting her know that Elwood Ede, a well-known Orthoptera collector, wanted to donate his grasshopper collection to the museum (Fig. 1). At the same time Judy Collins, University of Maine Associate Scientist working for Dr. Frank Drummond, called to say that she was packing up insect specimens for deposit at the museum and had bee material that needs to be transferred to drawers for final deposition at the museum. Plus Bob Nelson has hundreds of Coleoptera specimens that he would like to move from his house to the museum. The museum has ordered drawers, unit pinning trays and another cabinet to house the material coming in to the collection. We will be looking for willing hands to help with the detailed work of moving specimens.

With my leaving the Maine Forest Service it was decided that excess specimens of various sorts that had been housed at the MFS Entomology Laboratory would also be moved to the MSM collection to facilitate continued work on the material. That was accomplished in April with the help of some mostly retired MES members. The MFS also transferred three older microscopes to the museum. Thank you Maine Forest Service!

The space at the MSM annex where the insect collection is housed is still undergoing rearrangement to facilitate work on various zoological collections (Fig. 2). Again, mostly retired MES members (Dave Bourque, Kathy Claerr, Dana Michaud, Liz Mazurkiewicz, Bob Nelson and I) moved shelving and tables to accommodate the insects and provide work space.

Then last week when MES went to the University to help with the teaching collection, I was given hundreds of amazing 100-year-old, double-sided glass mounts of moths and butterflies. Everyone who has seen them has been impressed by their exquisite craftsmanship and wants to show them off to the public. (See the article by Kathy Claerr on this lep donation on page 8!)



Fig. 1. A typical drawer from the Elwood Ede grasshopper collection.



Fig. 2. Organizing insect collection materials at the Maine State Museum Annex.

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**Trapping Assistance Needed**

The US Forest Service recently confirmed detection of a native Western US species of Scolytinae never before known from the east. It was found in a multiple funnel trap sample in Baxter State Park. *Pityokteines lasiocarpi* (Swaine) is a polygamous species which breeds in the bole and large limbs

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### Trapping assistance needed (cont.)

of cut, fallen, or dying trees. It is not an aggressive species and rarely becomes abundant. Recorded hosts are *Abies amabilis* (Pacific silver fir), *A. lasiocarpa* (subalpine fir), *Picea engelmannii* (Engelmann spruce) and *Pseudotsuga menziesii* (Douglas-fir). Eastern hosts are unknown, but are presumably *Abies balsamea* (balsam fir) and/or *Picea rubens* (red spruce).



The USFS wants to find more specimens and localities. You can help! Do you have a recently harvested or disturbed spruce/fir site accessible to you? Are you able to set up a funnel trap (trap and supplies will be provided) and make biweekly collections for about 6 weeks in the late summer/fall? If so, contact Marc DiGirolomo ([mfdigirolomo@fs.fed.us](mailto:mfdigirolomo@fs.fed.us)) for more information.

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### Searsport Field Walk on Insect Tracks and Signs on August 4th

**Saturday, August 4**, from 1:00 to 3:00 p.m. A field walk on Insects: their identification, tracks and signs.

Charley Eiseman, lead author of *Tracks & Sign of Insects*, is a freelance naturalist based in western Massachusetts, and has done natural resource inventories throughout New England for the past 20 years. The previous week he will be teaching a course on this topic at Eagle Hill Institute in Steuben, Maine, and has enthusiastically agreed to lead this walk on his way home.

Meet at the **Long Cove Headwaters Preserve in Searsport**. From Route 1 in Searsport, take Mt. Ephraim Road west for 2.6 miles, and turn right onto Savery Road. Go 0.6 miles to the preserve parking lot on the right.

### New Children's Beetle Book – FREE!

A new children's book, *Bombo's Big Question* by Kip Will, is now available online as a free eBook! You can also acquire it for a modest sum in print or via Kindle (for a small distributor fee). Gorgeously illustrated by Ainsley Seago and full of fun, quality information about beetles, evolution, and more, this book is suitable for both children and adults alike.

*Bombo's Big Question* is a fable about the adventures of a beetle named Bombo who is in search of an explanation for what she sees as her 'superpower.' It's an allegory that intends to promote curiosity, critical thinking, and natural explanations. Ultimately Bombo does find a good answer and one that goes beyond a mechanistic explanation in that the answer connects her personally to the rest of life."

Ultimately, this book is about how evolution provides the answer for the diversity of life and its many different forms, traits, and strategies. It also has a number of excellent explanations in the back about the main themes of the book (e.g. "family trees and evolving characters", "genes and cells", etc).

Low-resolution PDF (2 Mb):

<https://pterostichini.files.wordpress.com/2018/05/bombo-ebook-low-res.pdf>

High-res PDF (23 Mb):

<https://pterostichini.files.wordpress.com/2018/05/bombo-ebook-high-res.pdf>

Official eBook (35 Mb):

<https://drive.google.com/file/d/1hWUXkyuPPDQZUw2F25YAshYFq3YSCrT2/view>

Amazon print edition:

<https://www.amazon.com/Bombos-Big-Question-Kip-Will/dp/1986476413/>

Kindle edition:

<https://www.amazon.com/Bombos-Big-Question-Kip-Will-ebook/dp/B07CSQM35B/>

### COMING M.E.S. EVENTS in 2018

(details of most events will be in future newsletters)

- |                     |  |
|---------------------|--|
| <b>12 May</b>       | field day at Sunkhaze Meadows – Benton; see M.E.S. web site for more information.                        |
| <b>9 June</b>       | field day at Moosehorn NWR, Washington Co. (see story, p. 8)   |
| <b>14 July</b>      | field day in T4 R7 WELS (Charlene's camp by the new Katahdin Woods and Waters Nat'l Monument – see p. 9) |
| <b>4 August</b>     | insect tracks, signs and identification – Long Cove Headwaters, Searsport – see notice at left           |
| <b>25 August</b>    | field day at Kathy Claerr's, Bowdoin   |
| <b>8 September</b>  | field day in Rangeley area, Saddleback   |
| <b>12 September</b> | Bug Maine-ia at Maine State Museum   |
| <b>6 October</b>    | M.E.S. Annual Meeting in Clinton   |
| <b>?? November</b>  | Speaker from Maine Bumble Bee Atlas project  |

(See <http://www.colby.edu/MES/> for more detailed information; new information on any event will be posted as soon as received.)

*The Maine Entomologist* is the quarterly newsletter of the Maine Entomological Society. Dues are \$15 per year. Checks should be made payable to the M.E.S. and sent to Mr. Dana Michaud, M.E.S. Treasurer, at 3 Halde Street, Waterville, ME 04901-6317. Our records show your dues are paid through the year printed on your mailing label; please contact Dana if you believe this is in error. *Individual articles reflect the opinions of the authors and mention of any specific commercial products or businesses should not be construed as formal endorsement by the M.E.S. of any such product or business.*