

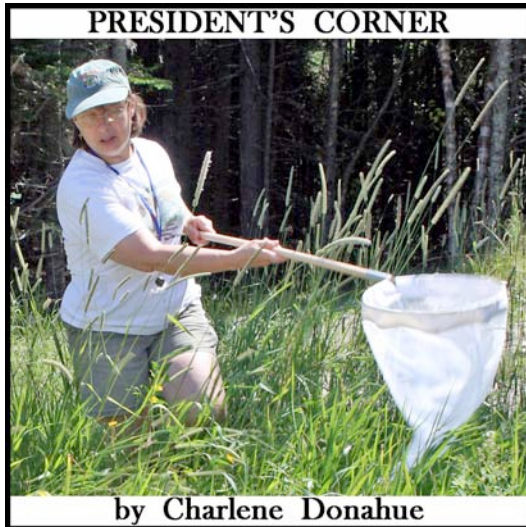
The Maine Entomologist

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

The Official Newsletter of the Maine Entomological Society

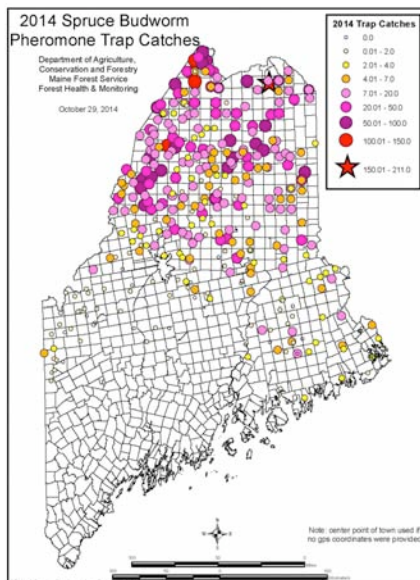
Vol. 18, No. 4

November, 2014



I have had some interesting experiences recently that I would like to share with you. The first is a monitoring program for spruce budworm (*Choristoneura fumiferana*) that I set up this spring. The Maine Forest Service has been monitoring spruce budworm for literally decades using first light traps – run on white gas! – and now electric lights and battery-powered ones as well as pheromone traps.

Budworm is a native insect that periodically explodes to outbreak conditions and devours balsam fir and spruce trees. It is poised to return to Maine, so in order to more adequately keep tabs on the budworm population I enlisted the assistance of managers of large land parcels in the northern half of the state.



Twenty land owners/managers had their crews set out over 1200 traps at just over 400 sites spread across the landscape. They properly deployed the traps, picked them up and sent in the specimens collected with the requested location information.

Only seven out of 400 sites had unusable data - most due to bears destroying the traps (they don't like new things in their woods). What impressive cooperation for the first year of a program! Of course these are the people who will directly benefit from the information, but still it was gratifying to have it work so well.

The results? Traps at six sites in very northernmost Maine captured over 100 moths/trap, which is high enough to start seeing light defoliation next year. This is in line with what the Canadians are seeing in New Brunswick and Quebec. For more information on spruce budworm go to:

http://www.maine.gov/dacf/mfs/forest_health/insects/spruce_budworm_2014.htm

Last month a neighbor stopped in with a bunch of insects stuck to a piece of tape and asked what they were. She said a friend told her they looked like fruit flies but she did not have flies. any fruit out. I looked at them and they were indeed fruit flies. So I told her that the flies could be on other rotting plant materials as well and to see if she could track down what they were breeding in, as that was the only way to really get rid of them.

I got a call back the next day from her. She had found the problem. She had brought in a bucket of butternuts to dry and had forgotten about them. When she pulled out the bucket she said, "It was about ready to fly away there were so many fruit flies on it." Instead of drying, the nuts were rotting. She threw them over the bank out back and solved the problem. It is always nice to hear the end of the story!

Third story. There are a couple of people in Maine who have recently started 'leaving the light on' for moths this summer. They are identifying them, photographing them and looking for ways to share their knowledge. If there are others who are interested in either moths in particular or in helping develop a website, blog or other internet tools for sharing and disseminating the information you can contact me and I will put you in touch with the 'moth-ers'. Might be a fun way to spend some winter days.

* * * * *

Inside:

- Benefits of Maine's Mosquito Fauna (p. 2)
- Bug Maine-ia Wows Them Again (p. 3)
- Annual Meeting Report (p. 4)
- Honeybees and Blueberries (2 stories; p. 5)
- Book Review: *Social Conquest of Earth* (p. 6)
- Natural Controls on Emerald Ash Borer (p. 6)
- Book Review: *Beetles of Eastern North America* (p. 7)
- Literature Notice: Carabids of Maine (p. 7)
- New Book notice: *Birdology* by Monica Russo (p. 8)
- Coming M.E.S. Events in 2015 (p. 8)

Importance of Mosquitoes: a few overlooked environmental benefits of Culicidae and a quick note on Maine's fauna

By Gary D. Ouellette

The mosquitoes, family Culicidae, are considered among the most deadly animals on earth with greater than a million attributed deaths per year, according to the World Health Organization; however, they are often overlooked for their importance to the environment. At present, there exists greater than 3535 described species of mosquitoes worldwide (Harbach, 2011); they inhabit most land surfaces ranging from the tropical regions to arctic tundra to the Himalaya with their greatest diversity found in tropical forest environments (Foley et al., 2007).



Anopheles punctipennis (Say), the "Spotted-Winged Mosquito" is a major summer pest in Maine and a potential carrier of West Nile Virus (Foss and Dearborn, 2003). Its potential role as a pollinator in Maine is unknown.

Photo by Mike Quinn, *TexasEnto.net*; used with permission.

Although these animals are capable of transmitting a myriad of horrible pathogens and diseases including West Nile Virus, Malaria, yellow fever, dengue fever, Japanese encephalitis, La Crosse encephalitis, St. Louis encephalitis, Western equine encephalitis, Eastern equine encephalitis, Rift Valley fever, Chikungunya virus, filarial worms (helminthes) and are even capable of mechanically transmitting anthrax (*Bacillus anthracis*) (Turell & Knudson, 1987), they are an important element to the health of the planet.

A recent paper by Fang (2010) has addressed the question of how the world's ecosystems would be impacted if all mosquitoes were eradicated; the paper reviews many environmental benefits, highlighting the mosquito's ecological importance. To begin with, mosquitoes are food for many different organisms; if there were no mosquitos then a broad diversity of species including fish, insects, salamanders, spiders, frogs and lizards would also lose a primary food source.

An interesting example of a mosquito specialist which would be directly affected by the loss of mosquitoes includes the East African salticid spider, *Evarcha culicivora*. This spider prefers feeding on mosquitoes; it has evolved the ability to identify a mosquito in a group of shore flies by sight alone, even when its prey is entirely motionless (Cross & Jackson, 2010). Even more bizarre, *E. culicivora*'s specificity of mosquitoes is believed to be a strategy of feeding indirectly on a vertebrate blood meal; *E. culicivora* will selectively prey on blood-carrying female mosquitoes when the alternative is either a female that has not had a recent blood meal or a male which does not blood feed (Cross & Jackson, 2010).

Mosquitoes have also been suggested to act as pollinators for thousands of plant species; by eradicating mosquitoes, we would be removing an important group of pollinators from the environment (Fang, 2010). The effects would be most prominent in the subarctic where mosquitoes are significant pollinators of many plants (Kevan 1972).

Two examples of North American plants pollinated by mosquitos include the orchid species *Habenaria obtusata* and *Platanthera flava*, both visited by mosquitoes of the genus *Aedes* (Argue, 2011; Gorham, 1976; Thein, 1969a; Thein, 1969b). Many adult mosquito species depend on nectar and sugars from extrafloral-nectaries for energy sources (Grimstad & DeFoliart, 1974; Mogi & Miyagi, 1989). Remember, only females of a select group of species actually need a blood meal to receive the proteins required for laying eggs, and most importantly to remember is that not all mosquito species feed on humans.

As immature larvae, mosquitoes comprise a substantial biomass in many aquatic ecosystems. The nutritional requirements of the immature mosquitoes are met through the consumption of both living and dead organic material; this includes heterotrophic microorganisms and particulate matter either suspended in the water column or resting on surfaces.

As a family, they employ several feeding strategies: mosquitoes may graze on microbial biofilms, filter-feed or even shred detritus (Merritt et al., 1992). By feeding, mosquito larvae contribute to and facilitate the break-down of decaying leaves and organic detritus. It has been further suggested that mosquitoes serve as a primary component of a functioning wetland ecosystem by processing aquatic microbes and detritus, and eventually providing a direct ecological link between aquatic and terrestrial environments when the adults emerge (Kraus & Vonesh, 2012). Accordingly, the overall importance of these insects in the world's ecosystems should not be underestimated.

The Maine mosquito fauna has received considerable attention over the last century (Bean, 1946; Holman et al., 2006; McDaniel, 1975) with surveys conducted by Proctor (1946) and more recently by the Maine Forest Service (Foss & Dearborn, 2002a; Foss & Dearborn, 2002b). Presently there are *circa* 45 species in Maine, with as many as 17 of these species capable of transmitting either West Nile Virus or Eastern equine encephalitis.

For individuals interested in collecting mosquitos on their next field trip, the Walter Reed Biosystematics Unit provides comprehensive online identification tools (www.wrbu.org) with many resources including taxonomic keys, basic/advanced mosquito morphology descriptions, high-resolution images and a world systematics catalog. In addition, appended below is a short list of cited works and I encourage all to further explore this medically and environmentally important, as well as interesting, family of insects.

Cited Works and Further Reading

- Argue, C.L. 2011. The Pollination Biology of North American Orchids: Volume 1. Springer. 228 pp.
- Bean, J.L. 1946. A Preliminary List of the Mosquitos of Maine (Culicidae, Diptera). *Can. Entomol.* 78:25-28.
- Cross, F. R. & Jackson, R. R. 2010. The attentive spider: search-image use by a mosquito-eating predator. *Ethology* 116: 240 – 247.
- Fang, J. 2010. Ecology: A world without mosquitoes. *Nature.* 466:432-434.
- Foley, D.H., L.M. Rueda, & R.C. Wilkerson. 2007. Insight into Global Mosquito Biogeography from Country Species Records. *J. Med. Entomol.* 44(4): 554-567.

continued on next page

Benefits of mosquitos (cont.)

- Foss, K.A. & R.G. Dearborn. 2002a. Preliminary Faunistic Survey of Mosquito Species (Diptera: Culicidae) with a Focus on Population Densities and Potential Breeding Sites in Greater Portland, Maine. Forest Health and Monitoring Division, Maine Forest Service. Technical Report No. 42. 38 pp.
- Foss, K.A. & R.G. Dearborn. 2002b. Preliminary Survey of Mosquitos Species (Diptera: Culicidae) with a Focus on Larval Habitats in Androscoggin County and Additional Larval Data for Portland, Maine during 2002. Forest Health and Monitoring Division, Maine Forest Service. Technical Report No. 44. 55 pp.
- Foss, K.A., and R.G. Dearborn. 2003. Mosquito Species Occurring in Maine. Table (in pdf format) accessible at <http://www.maine.gov/dacf/php/gotpests/bugs/mosquito.htm>
- Gorham, J. R. 1976. Orchid pollination by *Aedes* mosquitoes in Alaska. *Am. Mid. Nat.* 95: 208-210.
- Grimstad, P. R. & G. R. DeFoliart. 1974. Nectar sources of Wisconsin mosquitoes. *J. Med. Entomol.* 11: 331-341.
- Harbach, R.E. 2011. Mosquito Taxonomic Inventory (database). <http://mosquito-taxonomic-inventory.info/>
- Holman, M.S, R.F. Darsie Jr., & K.A. Foss. 2006. A Checklist of the Mosquitos of Maine with New State Records. *J. Am. Mosq. Control. Assoc.* 22(2): 327-329.
- Kevan, P. G. 1972. Insect pollination of high arctic flowers. *Journal of Ecology* 60: 831-847.
- Kraus, J.M. & J.R. Vonesh. 2012. Fluxes of terrestrial and aquatic carbon by emergent mosquitoes: a test of controls and implications for cross-ecosystem linkages. *Oecologia* 170(4):1111-22.
- McDaniel, I.N. 1975. A List of Maine Mosquitoes Including Notes on their Importance as Pests of Man. *Mosquito News.* 35(2): 232-233.
- Merritt, R.W., R.H. Dadd, & E.D. Walker. 1992. Feeding behavior, natural food, and nutritional relationships of larval mosquitoes. *Annual Review of Entomology* 37: 349-376.
- Mogi, M. & I. Miyagi. 1989. Sugar Feeding of *Topomyia pседobarbus* (Diptera: Culicidae) in Nature. *J. Med. Entomol.* 26(4): 370-371.
- Procter, W. 1946. Biological survey of the Mount Desert Region. Part VII. The Insect Fauna. Philadelphia. The Wistar Instit. Of Anatomy and Biology. 566 pp.
- Thien, L. B. 1969a. Mosquito pollination of *Habenaria obtusata* (Orchidaceae). *Am. J. Bot.* 56(2): 232-237.
- Thien, L. B. 1969b. Mosquitoes and *Habenaria obtusata* (Orchidaceae). *Mosquito News* 29: 252-255.
- Turell, M.J. & G.B. Knudson. 1987. Mechanical transmission of *Bacillus anthracis* by stable flies (*Stomoxys calcitrans*) and mosquitoes (*Aedes aegypti* and *Aedes taeniorhynchus*). *Infect. Immun.* 55(8):1859-61.

* * * * *

BUG MAINE-IA 2014 at the Maine State Museum

by Gigi Hutchins and Joanna Torow

Bug Maine-ia 2014 took place on Wednesday September 10. The museum staff had been in preparation mode for weeks – after all, Bug Maine-ia is the busiest day of the year! And this year’s event did not disappoint, with 23 exhibitors engaging the minds of 1,491 visitors from 17 schools and many more homeschools. The energy was high and contagious, the exhibitors were psyched, there were bugs aplenty, and the interactions were priceless. This is a day filled with fascination and engagement and every visitor comes away with a new understanding and appreciation for our insects and the role they play in our world, and our lives.

But it took a lot of work and a lot of people to make sure it all went off without a hitch. Let’s take a look back... 34 tables gathered along with 50-plus chairs, all of which were set-up following the carefully prepared placement plan along with extra lighting and electrical cords as needed by the exhibitors. Next, exhibitor and directional signs are created

The Maine Entomologist

and hung; ants for the ant trail are printed, cut out (all 400 of them!) and laid down to guide visitors around the museum and to all the exhibitors, and then maps and programs are created and printed. Then we have to get the word out with press and media releases.

The day before the event, Maine State Museum Educator Gigi Hutchins visited 92Moose (WMME) for an early morning radio promotion spot. 92Moose (WMME) is a big supporter of museum events, and makes the promo spot not only informative but also very entertaining, helping to draw in even more visitors.

Next, additional volunteers are rounded up to help with both set-up and during the day of the event, adding much-needed help. Lastly, inflatable insects are blown-up and hung throughout the museum to finalize the transformation. The museum was as busy as the hive of honey bees being showcased by the Kennebec County & Maine State Beekeepers Associations.



Karen Coluzzi helped educate students at Bug Maine-ia about the Asian Longhorn Beetle, dressed in full costume; Reneé Vicary was an Emerald Ash Borer. Fortunately, it was a cool day! Photo by Edie King

Finally the big day arrives and everyone hits the ground running! Presenters start to arrive at 7:30 a.m. for set-up, and we are ready for them with a coffee, donuts, and muffins (important stuff). All museum staff and volunteers are in their places, and promptly at 9 a.m. come the first wave of buses to be greeted by staff stationed in front of the museum. Students from all around the state feel the excitement that this day always brings. For a day, everyone is a budding entomologist. Ask any busload of students “who is going to hold the tarantula?” and all hands go up! And hold them they do, along with scorpions, millipedes, giant cockroaches, and stick insects, to name a few.

continued on next page

November, 2014

Bug Maine-ia (cont.)

Students had a lot of see and do this year, including a visit with Charlene Donahue, who had kids holding magnifying glasses making detailed observations in her exhibit "Insects in the Woods." Dick & Marge Dearborn's fuzzy caterpillars are always a hit, as is Dana Michaud's amazing display of insect specimens. Alison Kanoti and David Bourque were surrounded with rambunctious kids with nets on the lawn behind the museum as they patiently identified every captured insect. Edie King shared her personal insect collection and advised students how to get started with bug collecting. Mary Bird shared the story of Edith Patch, one of the first women in America to become a professional entomologist, and engaged students with insect puzzles, while nearby the Hudson Museum presented insect jewelry and other objects that celebrate the insect world.

Throughout the day, Maine guide Sean McCormick always had a crowd of students surrounding the table where he demonstrated fly-tying and talked about the bugs that fish feed on. Jim Nutting, a perennial favorite, displayed his beautiful stained-glass insect showcases, as well as allowing students to handle his many tarantulas. Tony Sohns, who started it all with his bug zoo, and was in attendance with his fascinating specimens and fun facts. Many more displays filled the museum, too many to name here, but all drew a crowd and filled young and old minds with wonder and a new appreciation for the world of insects and arachnids.

Many heartfelt thanks go out to all the entomologists, bug enthusiasts, and volunteers who help to make this day a success year after year - we couldn't do it without you! Thank you for helping us create lasting memories for a crowd of young and old visitors alike. Let's say we do it all over again next year! See you then!

* * * * *

Sparse Attendance at Annual Meeting

Only nine M.E.S. members turned out for the annual meeting in Clinton on Saturday, 13 September. Both President Charlene Donahue and Board Member Brandon Woo were unable to make the meeting due to other commitments.

Vice President Karen Hopkins called the meeting to order at 1:30 p.m. Dana Michaud presented his report as Treasurer. The number of members receiving the newsletter electronically has helped reduce printing and mailing costs, so there will be no need for a dues increase in the near future. Dana also reported that there were 35 M.E.S. T-shirts and 28 sweatshirts left to be sold; he indicated that at the price being charged, the sweatshirts are being sold at a slight loss against their cost.

The balance in the M.E.S. general fund on 31 August, 2014, was \$1941.59; the balance in the Scholarship Fund was \$1481.09. This then led to a discussion of outreach efforts to use this fund in the manner in which it was intended, and there was uncertainty as to the status of the Scholarship Committee. It was decided that we should wait for President Charlene Donahue to return from her trip before addressing the issue, but that it did need to be addressed.

Nettie Nelson gathered the M.E.S. financial records from Treasurer Dana Michaud and went over them, certifying that all appeared to be in order, and that the accounting was accurate.

The minutes of the 2013 Annual Meeting, as reported in the November, 2013, issue of the newsletter, were unanimously approved without amendment.

The next item on the agenda was the election of officers. Since no candidates came forward to challenge the

incumbents, all sitting officers were re-elected for 2015: President Charlene Donahue, Vice President Karen Hopkins, Treasurer Dana Michaud, and Members-at-Large Edie King and Brandon Woo.

Election of officers was followed by a proposed change in the M.E.S. By-Laws, to allow a category of lifetime members. Following considerable discussion about this and the potential dues charges, the concepts were separated. The idea of a category of "Life Member" was approved by unanimous vote of those present. Discussion then turned to the issue of the amount of dues that should be charged, and a value of 20 times the normal annual dues was proposed, or \$200 at current dues levels of \$10 per year. There was some concern that this was excessive, but it was pointed out that this is entirely a voluntary membership category, that those who felt this would be a financial hardship could remain as normal members. The dues proposal also passed with unanimous support. *However, the M.E.S. By-Laws require that any amendments be voted on by paper ballot, submitted by the membership. This vote at the annual meeting may therefore be invalid.*

The main newsletter update to report was that Mike Hrabar, the graduate student who is studying a parasite of our native paperwasp, *Polistes fuscatus*, found in his field studies in August in the greater Bangor-Skowhegan area, that approximately 40% of the adult wasps were parasitized by the Strepsipteran *Xenos peckii*, which is the target species of his study.

Peter Darling introduced and discussed the idea of a Google Groups blog for putting up information on spontaneous collecting trips, beyond the regularly scheduled M.E.S. field days. He indicated that such a feature could be a good way of communicating with others and coordinating collecting events, but that such a site requires constant maintenance. He's going to check with Doug Hickox at the Maine Audubon Society about various options that may be available.

A discussion of potential M.E.S. outreach efforts then led to a side-discussion of whether we are indeed a charitable organization certified by the Internal Revenue Service (IRS) as a 501(c)3-qualified non-profit institution. The collective institutional memory of those present was that the issue had been explored in the past, but no one could remember whether the appropriate forms had ever been submitted. Peter Darling opined that if annual reports had not been filed in the past three years, any exemption would have expired; Dana Michaud said that he had not filed any such reports. Peter said he would explore whether it would be appropriate for us to file for IRS 501(c)3 status, which would exempt us from paying sales taxes, for example. There was no certainty as to what the fees would be to file for such status. Diane Boretos pointed out that if we did receive official 501(c)3 status, there are numerous grants that could potentially be available to help with, for example, paying the costs of outreach activities.

The meeting then returned to the issue of outreach efforts, with a suggestion that we consider staffing a booth at the Common Ground Fair in Unity. **IF** we were a 501(c)3 non-profit organization, the fee for participation would be much reduced. It was pointed out that this could be an excellent site for distributing information on the M.E.S., for recruiting new members, and even for selling M.E.S. T-shirts and sweatshirts. Without a formal vote, it was generally agreed that if we do indeed file for and receive formal non-profit status from the I.R.S., we should explore the possibility of having a presence at the Common Ground Fair in 2015.

continued on next page

Annual Meeting Report (cont.)

Edie and Louie King are members of the Edith Patch Society at the University of Maine, and discussed some of the things that the E.P.S. is doing, including the restoration of the Edith Patch house on the campus. The activity going on at The Edith Patch House is a major collaboration between the University and Edith Patch Group. They are restoring her house and grounds to be able to house a small museum of her collections and to be able to have a classroom for Entomology students, offering a hands-on effect because of the fields and woodlands abutting the property. They are establishing a habitat to attract insects, birds and small mammals. University of Maine students have been building trails, benches, and points of information as to what one is seeing at those points of interest. Eventually when it is completed, the facility will be open to all school children who are interested in the sciences that Edith Patch spent her life pursuing. They said they would talk with Mary Burke about potential collaborative efforts with the M.E.S.

The meeting then turned to discussion of the field days in 2015, which produced a large suite of great opportunities to gather and collect in diverse habitats around the state.

The Winter Workshop is set for January 10th, but as yet has no venue or topic. Tradition in the past has been for this to be held at the Maine Forest Service coordination center in Augusta, and be coordinated with the coming summer's BioBlitz at Acadia. However, this past year's Blitz was on beetles while the Winter Workshop was a very enriching one on pollinators, particularly native bees.

Saturday, March 28th, will be a Maple Syruping Day in North Whitefield (Lincoln County), sponsored and hosted by Charlene Donahue.

Saturday, May 2nd, will be a field day on the Kennebec Plains (York County); Peter Darling will be hosting.

Saturday, May 30th, will be a field day at the Reclaim Plains in Old Orchard Beach (York County); Peter Darling will be hosting.

Saturday, June 20th, will be a field day at the Hidden Valley Nature center in Jefferson (Lincoln County); Kathy Claerr will host.

Friday through Monday, July 17-20, are the tentative dates for the annual Entomological BioBlitz at Acadia National Park (Hancock County). Though the exact target groups have yet to be set, the Myriapods (millipedes) will definitely be on the list.

Saturday, August 8th, Diane Boretos, a new member, has offered to host a field day at Big Wilson Stream in Sangerville (Piscataquis County). The site features an old-growth floodplain forest with multiple sub-habitats.

Saturday, August 22nd, will be a field day in Woolwich (Sagadahoc County). The property has marsh, river edge, mixed forest, hemlock stands, and a field. Charlene Donahue will coordinate this day.

Bug Maine-ia at the Maine State Museum is scheduled for Wednesday, September 9th, 2015; the 2015 annual M.E.S. meeting will be held once again in Clinton, on Saturday, September 12th.

The meeting was adjourned at 3:45 p.m.

* * * * *

Windbreaks Help Native Pollinators in Blueberry Fields

by Bob Nelson

A forthcoming article* in the *Canadian Entomologist* reported the results of a study of native pollinators in Canadian lowbush blueberry fields. Test plots were studied that included natural forest borders, natural windbreaks, and

artificial windbreaks with single and double rows of planted trees.

The greatest species diversity and abundance of pollinators were found within 5 meters of the forest margin, although otherwise the native pollinators were fairly uniformly distributed across all study plot types. Over 80% of the 3878 pollinators collected during the study were ground-nesting bees, particularly species of *Andraena* (Andraenidae), *Bombus* (Apidae), *Lasioglossum* (Halictidae), and both *Megachile* and *Osmia* (Megachilidae).

Enhancing habitat for native pollinators is seen as a worthwhile goal because of increased costs of honeybee rentals during the flowering season, and well-publicized losses in honeybee colonies. Native pollinators are also much more efficient in pollinating the blueberry flowers than are the domestic honeybees, as Frank Drummond and his students pointed out in last year's Winter Workshop (see last February's newsletter for a discussion of their presentations).

* Moisan-DeSerres, Joseph, Madeleine Chagnon, and Valérie Fournier, *in press*: Influence of windbreaks and forest borders on abundance and species richness of native pollinators in lowbush blueberry fields in Québec, Canada. *Canadian Entomologist*; doi:10.4039/tce.2014.55 (published on-line on 10 September, 2014).

* * * * *

Surprise, Surprise: Honeybees May Not Always Pollinate the Target Crops as Their #1 Priority!

by Bob Nelson

A recent paper* in the on-line journal PLoS One reported the results of a study that evaluated pesticide exposure to honeybee colony infestation by a gut pathogen that's been one of the suspects in CCD (Colony Collapse Disorder). What was found was that exposure to fungicides, in particular, enhanced the susceptibility of the honeybees to the pathogen.

A side-issue discovered during the study, however, was that though the beehives studied were situated in seven different crops in different parts of the country (e.g., almonds in California, blueberries in Deblois, Maine, etc.), in only the almond orchard in California and an apple orchard in Pennsylvania did the honeybees collect significant amounts of pollen of the target crops; most of what they collected elsewhere was the pollen of wildflowers! Apparently, flowers of blueberries, cranberries, cucumbers, watermelons and pumpkins were all ignored (see figure), at least during the limited time of the pollen sampling.

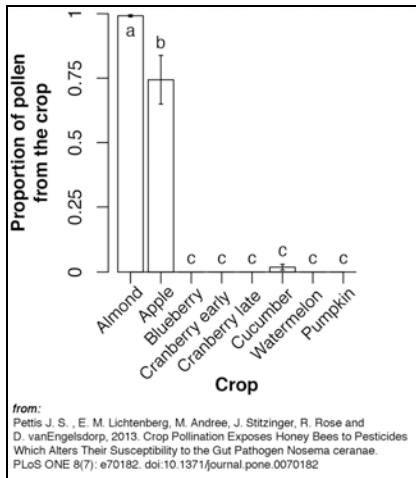
This struck me as very odd, so I ran this by Frank Drummond at the University of Maine. He's been studying honeybees in Maine's blueberry fields for over 25 years, and cautioned against reading too much into this result. He said that it's highly unusual for honeybees to ignore the blueberries for the entire bloom season, though they may become fixated temporarily on wildflowers.

The authors in this study collected pollen from the honeybees only over a three-day period, for example, and this may have been a time when wildflowers were particularly attractive. This reminded me of a study I'd read in the late 1980s, comparing the Carabid fauna of *Sphagnum* bogs in North America and Europe. One of the American sites sampled was the Great Sidney Bog here in Maine, outside of Augusta. They collected no carabids at all – and concluded, based in part on this result, that the fauna was much more diverse in Europe than it was in the Americas. However, they had collected here in August – which in my experience is the absolutely worst time of the summer for carabids in sphagnum bogs.

continued on next page

Honeybees Targeting (cont.)

Earlier in the summer, or even later in the fall, would have been productive. But I've personally never found any adult Carabids in August in a sphagnum bog in Maine, despite long hours of looking.



The take-away lessons from this indirect result of the recent pollination study, however, are that (a) one should always check the data sources before giving too much credence to seemingly startling interpretations, and (b) that native pollinators may still be significantly more important to pollination than is generally acknowledged – as intimated in the forthcoming article in the *Canadian Entomologist* noted above. Certainly, research currently underway by Frank Drummond and his students and colleagues will add significantly to our understanding of the potentially critical importance of native pollinators in Maine's blueberry fields.

Reference:

* Pettis J. S., E. M. Lichtenberg, M. Andree, J. Stitzinger, R. Rose and D. vanEngelsdorp, 2013. Crop Pollination Exposes Honey Bees to Pesticides Which Alters Their Susceptibility to the Gut Pathogen *Nosema ceranae*. PLoS ONE 8(7): e70182. doi:10.1371/journal.pone.0070182

* * * * *

Book Review. *The Social Conquest of Earth*

by Edward O. Wilson; New York: Liveright Publishing Corp., 2013; 330 p., paperback, \$17.95 list price.

Reviewed by Kathy Murray.

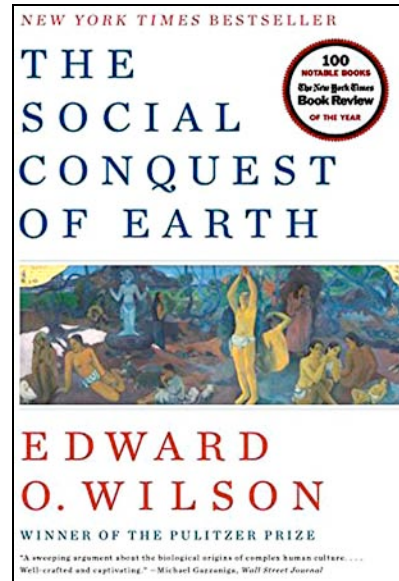
Wilson's curiosity about the natural world has not dimmed in a career spanning nearly 60 years. At 85, the famed ant specialist is still exploring and inspiring scientific inquiry through lectures, his non-profit foundation (the E. O. Wilson Biodiversity Foundation) and his writing. In *The Social Conquest of Earth*, he succinctly traces more than four decades of research in the field of sociobiology and further explores the evolutionary basis of eusociality, concluding that the human race has much in common with social hymenoptera.

If anyone can make a convincing argument for such a grand comparison, it is Dr. Wilson. Recipient of the U.S. National Medal of Science, member of the National Academy of Sciences, and a two-time Pulitzer Prize winner, E.O. Wilson is one of our foremost biologists and an excellent writer.

Drawing on his remarkable knowledge of insect biology and social behavior he explores the human condition and the evolutionary forces favoring the dominance of earth by the human race. Based on his studies of ant colonies, he was an early proponent of the idea that altruistic behavior evolved

The Maine Entomologist

due to 'kin selection' (natural selection favoring the reproductive success of an organism's relatives, even at a cost to the organism's own survival) exemplified by the non-reproductive worker castes found in ant and honeybee colonies.



However, in this book, he wrote that he now thinks he was wrong on that score and favors 'group selection' as the mechanism behind the evolution of social behavior. Humans (and ants and honeybees) have evolved in groups, which he points out is both a blessing and a curse for the human race, resulting in improved odds for survival but frequent conflict between groups.

The evolved social behaviors enabling us to make technological and cultural advancements through cooperation are the same ones that lead to wars between human populations. That is, genetic preprogramming influences the expression of learned behaviors in humans, ants and other social animals.

Wilson makes a strong case that as social animals, humans can learn much about the human condition by studying social insects. Entomologists and other humans will find this an immensely fascinating and thought-provoking book.

* * * * *

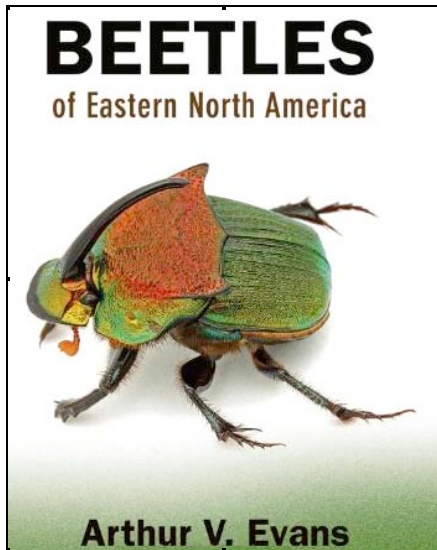
Emerald Ash Borer: A Glimmer of Hope

A forthcoming article* in *The Canadian Entomologist* enumerates the natural controls that are starting to emerge in North America on the exotic Emerald Ash Borer (EAB, *Agilus planipennis*), which has killed millions of ash trees in Michigan and elsewhere since its introduction over a decade ago. The species has been found close to the Maine border in NH (see <http://www.maine.gov/dacf/php/caps/EAB/index.shtml>)

Woodpeckers (downy, hairy and red-bellied) are becoming important vertebrate predators, and several species of parasitica (particularly Braconid wasps of the genus *Atanycolus*) that normally prey on native *Agilus* species have successfully parasitized *A. planipennis*.

Bob Nelson has a pdf of the pre-publication version of the CanEnt paper should anyone want a copy. E-mail him at BeetleBob2003@yahoo.com.

* Lyons, D.B., 2014: What's killing the green menace: mortality factors affecting the emerald ash borer (Coleoptera: Buprestidae) in North America? *The Canadian Entomologist* (in press)



Book Review: *Beetles of Eastern North America*,
 by Arthur V. Evans; Princeton, N.J.: Princeton University
 Press, 2014; 560 pp., paperback, \$35 list price.
 Reviewed by Bob Nelson

This is a magnificently illustrated, very interesting and affordable volume that I purchased in hopes it would be better than my antique copies of Dillon and Dillon (*Common Beetles of Eastern North America*, 1972) and the all-but-unillustrated 2-volume set *Beetles of Northeastern North America* by Downie and Arnett (CRC Press, 1994) for identifying beetles in groups other than Carabids that I may collect from time to time. It's my own fault I don't yet have a copy of the (rather expensive) two-volume set *American Beetles* (Arnett *et al.*, 2000, 2002) against which to compare it.

In reality, this volume is in between the two references I do have in usefulness, and as such will be a valuable addition to my library. It's beautifully illustrated with over 1500 high-quality photos of 1406 species in all of the 115 beetle families found east of the Mississippi River, and the taxonomy appears to be totally up-to-date with all the latest changes in family and genus names. Each of the species illustrated (typically 4 per page) includes a thorough physical description, as well as information on seasonal activity, food preferences, and overall distribution, so far as known. Very importantly, at the end of each species description is a number in parentheses, indicating how many species are known in eastern North America, or all of North America, that are in that same genus – a number sometimes quite large.

Inside the front cover is a "quick index" to the appropriate pages for the 10 most commonly encountered beetle families, while inside the back cover is a labelled photograph of a carabid with all the key body parts clearly labelled. My copy came with a measuring scale glued inside both the front and back covers, in millimeters and inches, which one would presume will be in all copies. (I can only assume there was an erroneous scale here originally.)

The first-time user may initially expect that this is a thorough catalog of the entire beetle fauna of the eastern portion of the continent, but that misconception will be laid to rest at the outset. The five-page key to families admittedly is a guide to the 68 most common families, but is illustrated and deliberately made very use-friendly. A great idea is the inclusion of a guide to "similar families" in each family entry, as appropriate – so that if one thinks one might have an unusual scarab, for example, there are also cross-references to

the lucanids, glaresids, trogids, geotrupids, ochodaeids, hybosorids, and glaphyrids, with notes to the key distinguishing characteristics of each of those other families, as well as the page number on which to find them.

At the very outset, under "How to use this book," the reader is advised that "(t)o get the most out of this book, read its introductory sections before venturing out into the field." Wow – admonition to "Read the instructions!" What a novel concept (especially for us guys, who of course "don't need no instructions").

This "Introduction to Beetles" is amazing in its thoroughness, from the basics of anatomy and ecology, through collecting techniques both generalized and specialized, and even including a section on macrophotography, showing the equipment used by the author in taking the outstanding photos that were used in the volume. Basic instructions are also included on how to rear beetles, for those wishing to observe their behavior in a laboratory setting (even if the "lab" is your own dining room table after dinner).

The only down side I can identify at the outset is that there are no keys to genera under each of the families, but this is probably for the better – since there are numerous genera that could potentially be encountered, but that are not included in the volume, especially among large families with many genera (e.g., the Staphylinidae or Curculionidae).

Once you have a specimen identified to family, you can flip through the pages for that family and try to match your specimen to the photos. If it doesn't match anything here, but is reasonably close, you probably can be certain of the family identity. Going more deeply will require becoming more familiar with the anatomy of members of that family, so as to be able to use more specialized keys. Alternatively, if you can get one or more sharp photos and post them on BugGuide (<http://bugguide.net>), someone will very likely post an identification for you.

Overall, this is a great volume for someone just starting out or even more advanced in their beetle experience. I'll personally find it very useful for becoming re-familiarized with families I haven't really looked at since I was in graduate school, back in the late Paleolithic, as well as a lot of the new families that have come to be recognized (or re-named) since I was a student. It'll also be very useful for becoming familiar with the new taxonomy and family group placings, which has made great strides in recent decades as more and more larvae have been studied, and shown that some old groupings based on adult morphologies were cases of convergent evolution more than evidence of genuinely close relationships.

It was definitely a worthwhile purchase, and a very affordable one at that.

* * * * *

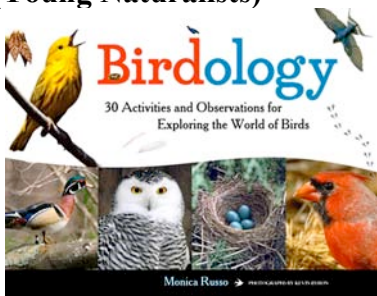
Literature Notice: Carabidae of Maine

Dick Dearborn and colleagues* have published a long-awaited synopsis of the ground-beetle fauna of Maine, covering all 425 species in the family for which there are authoritative records in the state. The paper covers the ecology of each species and its known distribution in the state, including maps for every species for which we have town records.

If you'd like a pdf copy of the paper, send an e-mail Bob Nelson (BeetleBob2003@yahoo.com).

* Dearborn, Richard G., Robert E. Nelson, Charlene Donahue, Ross T. Bell, and Reginald P. Webster, 2014: The Ground-Beetle (Insecta: Coleoptera: Carabidae) Fauna of Maine. *Coleopterists Bulletin*, vol. 68, no. 3, p. 441-599.

Book Notice: Birdology: 30 Activities and Observations for Exploring the World of Birds (Young Naturalists)



by Monica Russo, with photographs by Kevin Byron

MES charter member and logo and T-shirt designer Monica Russo has a neat new book coming out, officially, on January 1st. The plug from Amazon.com pretty much sums it up:

"This generously illustrated, full-color book teaches kids that birds can be seen almost anywhere: in city parks and streets, zoos, farms, and backyards. Using "Try This," "Look For," and "Listen For" prompts, *Birdology* promotes independent observation and analysis, writing and drawing skills, and nature literacy. Kids observe the diversity of shapes, colors, patterns, and behavior of birds; listen for their songs and the clap of wings; make a juice-box feeder; plant flowers that attract hummingbirds; start a birding journal and sketchbook; and much more. Other topics that are presented in clear, kid-friendly prose include migration, nesting, food, territories, and conservation and preservation. Additional resources, such as a glossary, bird orders and scientific names, bird and wildlife organizations, and "Teacher Topics" to initiate classroom discussion and investigation, are also included."

COMING M.E.S. EVENTS in 2015:

- 10 January Winter Workshop, Augusta (check the M.E.S. web site for more information, which will be posted as it becomes available)
- 28 March Maple syruping and bugging day, North Whitefield (Lincoln County)(contact person: Charlene Donahue)
- 2 May Field Day on Kennebunk Plains (York County)(contact person: Peter Darling)
- 30 May Field Day on Reclaim Plains, Old Orchard Beach (York County)(contact person: Peter Darling)
- 20 June Field Day at Hidden Valley Nature Center, Jefferson (Lincoln County)(contact person: Kathy Claerr)
- 17-20 July Entomological Bio-Blitz at Acadia National Park. Target group and contact person to be announced.
- 8 August Field Day at Big Wilson Stream in Sangerville (Piscataquis County)(contact person: Diane Boretos)
- 22 August Field Day in Woolwich (Sagadahoc County)(contact person: Charlene Donahue)
- 9 September Bug Maine-ia, Maine State Museum, Augusta (contact person: Joanna Torow – **Joanna.Torow@Maine.gov**)
- 12 September M.E.S. Annual Meeting, Clinton (contact person: Bob Nelson - **BeetleBob2003@yahoo.com**)

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

* * * * *



Maine Entomological Society
c/o R. E. Nelson
Department of Geology
Colby College
5804 Mayflower Hill
Waterville, Maine 04901-8858 U.S.A.

Visit our website at <http://www.colby.edu/MES/>

The Maine Entomologist is the quarterly newsletter of the Maine Entomological Society. Dues are \$10 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.*