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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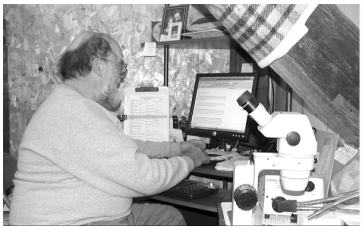

President's Corner

by Dick Dearborn

Candlemas or Groundhog Day, February 2nd - in times past, the mark of mid-winter for farm supplies of hay and firewood. Now is the time to finish up reports of 2006 activities and move ahead with plans for 2007.

This past year was a great one for MES and 2007 looks even brighter and more exciting. Whenever I feel the touch of midwinter "blahs," I remind myself of the longer days and reflect on the array of photos in our 2007 calendar, especially February, where the busy little syrphid fly on a bright yellow flower makes Spring seem not so far away.

In 2006: our membership grew to 139; our 4th Blitz at Schoodic featuring Diptera was a success; Bug Maine-ia exceeded all of our best expectations; and our calendar sales finally broke that 100 mark. Thanks to all who helped to make all of this possible.

Looking ahead, many exciting new opportunities are already evolving for 2007 to entice us so mark them down. Our first activity of the season was a highly successful one-day spider workshop in Augusta on January 13th. This prelude demonstrated an atmosphere of support for the 5th Blitz at the SERC facility in Schoodic in July featuring spiders. But to back up a bit to April 28th brings us to the eagerly anticipated first volunteer workshop for The Maine Butterfly Survey, to be held at Colby! [See p. 6!] This will most likely be the real start of the field season for enthusiasts especially in southern Maine. Other MES field events are scheduled for May 19th, June 9 & 23, August 18 ending with our annual field event and meeting in New Gloucester on September 15th.

Bug Maine-ia has not yet been scheduled but should occur in late September. Phew!!! Looks like you won't have time to get bored and there should be something for everyone. More information can be found in this and upcoming issues of The Maine Entomologist, on our website or directly from various event contacts.

Much of the work needed to bring this great array of opportunities to you has resulted from the efforts of a small core of very committed and dedicated members and cooperators. Now that plans have been laid, I encourage the rest of you to demonstrate your appreciation by supporting these events in whatever way possible be it attendance at one or more events, submitting articles or short field notes for our newsletter, photos for our calendar or offering suggestions for present or future activities. Make a pledge now to support your club in 2007

I'm excited! Are you? Hope to see you somewhere in 2007!

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Spider Workshop A Resounding Success

by Charlene Donahue

The Spider Workshop on Saturday January 13, 2007 was a rousing success! Jonathan Mays of the Maine Department of Inland Fisheries & Wildlife gave an outstanding presentation to a rapt group of twenty participants at the Maine Forest Service Entomology Laboratory in Augusta. Jonathan started with a presentation that covered spiders in general and then focused in on how to identify the major spider families in Maine.

After the presentation everyone had a chance to try their hand at identifying spiders. Microscopes were available along with many specimens from Jonathan's collection, Maine Forest Service material, Dan Jennings' holdings and ones that people had brought along. People seemed most interested in learning what key characters looked like, so that they could

cont. on p. 3

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In this issue:

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Are YOUR dues paid for 2007?

Check your mailing label to make sure!

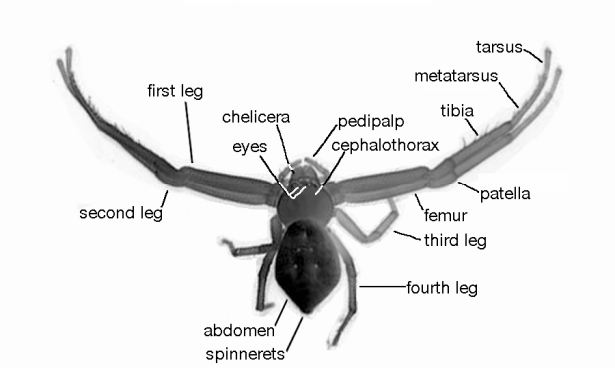
Maine Spider Blitz

Join us July 20-23 in our 5th year cataloguing biodiversity in Acadia National Park.

The Maine Entomological Society, National Park Service, Maine Forest Service, University of Maine, and Dorr Museum of Natural History at College of the Atlantic are again pleased to cosponsor the annual Schoodic Bio Blitz. This year's intensive weekend survey will focus on spiders. The event will be held at the Schoodic Education and Research Center (SERC) in the Schoodic section of Acadia National Park. Interested individuals, amateur and professional naturalists, are invited to participate.

Dr Rich Bradley from the Ohio State University has agreed to serve as this year's lead taxonomist for the Blitz. Dr. Bradley is excited about this opportunity and comes with a wealth of experience, both in spider taxonomy and with bioblitzes. Dr. Bradley earned a Ph.D. in Biology at the University of New Mexico where his dissertation research was on population biology of scorpions. He held a fixed-term lectureship at the University of Sydney (Australia) between 1983 and 1987 studying bird song as well as spider foraging ecology and population regulation. Dr. Bradley is currently an Associate Professor at the Ohio State University, Department of Evolution, Ecology and Organismal Biology, where he teaches general biology, ecology, anatomy & physiology, and ornithology. His current research focuses on spider population biology, biodiversity assessment, sampling, and patterns of biogeography of spiders. His current funded research project is the "Ohio Spider Survey," a primarily public-outreach project. He has taught hundreds of volunteers about spider sampling and identification in a variety of workshops and has produced extensive materials for this work including an ID basics manual.

As with past blitzes, there will be registration and meal fees to cover costs of the blitz. The National Park Service will provide housing for participants. Registration materials will be forthcoming and will be placed on both the MES (http://www.colby.edu/MES/) and the Schoodic Education and Research (http://www.nps.gov/acad/serc.htm) websites. For additional information, contact Kelly Pontbriand at Acadia National Park (email: Kelly_Pontbriand@nps.gov, voice: 207-288-1316). We should be able to post a downloadable application on the web site shortly.



Generalized anatomy of a spider, based on a modern crab spider (family Thomisidae)

Update on the Possibilities for Cooperation with the Entomological Society of America

by Andrei Alyokhin

The Entomological Society of America (ESA) is a non-profit organization serving the professional and scientific needs of people interested in a variety of insect-related disciplines. With more than 5,700 current members, it is the largest entomological organization in the world. The society has five regional branches (Eastern, North Central, Pacific, Southeastern, and Southwestern). It is also divided into six subject sections: A (Systematics, Morphology, and Evolution), B (Physiology, Biochemistry, Toxicology, and Molecular Biology), C (Biology, Ecology, and Behavior), D (Medical and Veterinary Entomology), E (Extension and Regulatory Entomology), and F (Crop and Urban Pest Management).

Membership in the ESA is open for everybody, and the Society's website (http://www.entsoc.org) lists its members as "researchers, teachers, extension service personnel, administrators, marketing representatives, research technicians, consultants, students, and hobbyists." Personally, I have been a member of the ESA since 1995, attended all of its Annual Meetings except one, and find my membership to be a rewarding experience. However, I am a professional entomologist with an interest not as much in insects themselves, but in the ways to kill them. Although there are certainly amateur entomologists who are members of the ESA, I would still define it as an essentially professional organization that serves the needs of academic and economic entomologists. The ESA is expensive to join ($130 per year), and many of its activities are geared towards insect control professionals like myself.

The ESA is currently undergoing a structural change. First, the number of its sections is being reduced from current six to the following four: (1) Evolution, (2) Structural, Veterinary, and Public Health Systems, (3) Plant-Insect Ecosystems, and (4) Sub-organismal Systems. Secondly, a system of semi-formal networks is being established within the Society to provide a forum and infrastructure for special interest groups to pursue scientific and professional interests. These can range from relatively large in scope and size (e.g., entomologists who work as extension specialists or primarily as teachers) to small and specialized (e.g., insect illustrators).

During the past three years, the ESA began contacting other insect-related societies in the U.S. about potential cooperation and arranging meetings between their representatives and the ESA President during the ESA Annual Meetings. On behalf of the Maine Entomological Society, I have attended the first such meeting in 2004 (see Volume 9, Number 1 of *The Maine Entomologist* for my report). It was exploratory in nature, with the ESA trying to learn about the needs and concerns of other groups. The second meeting was held in 2005 and focused exclusively on the effects of Sarbannes-Oakley Act on non-profit organizations. I passed the relevant information to MES President, but it was of little interest to the general membership and no report was published.

(cont. on p. 3)

M.E.S. - E. S. A. cooperation (cont. from p. 2)

The 2006 meeting took place on December 12 in Indianapolis, Indiana. It was attended by Frank Gilstrap, who is the current ESA President, other ESA officers, as well as the representatives of the Acarology Society, Hymenopterist Society, Southwestern Entomological Society, Georgia Entomological Society, Entomological Society of Canada, Entomological Society of Quebec, Society for Invertebrate Pathology, North Carolina Entomological Society, and myself representing the Maine Entomological Society and the Acadian Entomological Society.

The main topic of the meeting was the concept of networks in the context of the proposed ESA restructuring. It has relatively little relevance to the Maine Entomological Society because most of our members are not members of the ESA. I raised an issue of group membership of small societies like ours in the ESA (something that has been first discussed during the 2004 meeting). Although this possibility had not been rejected outright by the ESA, I got a feeling that this is not going to happen. The main impediment, as it often happens, is money. The ESA feels that group memberships will erode its financial base, even if they do not entail full access to the ESA benefits. Indeed, it is much cheaper to join the MES for $10 per year than the ESA for $130 per year. So, there is a legitimate concern that smaller societies will be used by some people as vehicles to get access to the benefits of the ESA membership (access to its periodicals, publishing papers, attending annual meeting at a reduced rate, etc.) without paying the full price. Therefore, even if the MES becomes a group member of the ESA, the membership status is unlikely to go beyond a simple formality.

Fortunately, there are other possibilities for collaboration between the MES and the ESA besides collective membership. Some of the networks that are likely to form within the ESA will be of definite interest to MES members. These may include a network of insect taxonomists, networks of people interested in particular taxonomic groups (e.g., beetles or dragonflies), illustrator network, insect photography network, network of people interested in using insects in primary education, etc. Therefore, I believe that our society should increase its visibility within the ESA. It has been proposed during the meeting that interested small societies set up a poster display during the 2007 ESA Annual Meeting in San Diego. Our poster may include information about the MES and its activities, potential collaborative projects (e.g., work on the Maine Butterfly Atlas), and contact information. Other regional societies represented at the meeting also expressed interest in creating such displays.

I think that fostering a closer connection with the ESA will benefit the MES. Both societies have a lot to offer to each other, and an improved synergy between amateur and professional entomologists will promote our growth.

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Are YOUR dues paid up? Check your mailing label to make sure! If not, you know what to do! Send your check or money order [or all of your labeled and identified museum-quality specimens] to Dana Michaud at the address on the last page!

Spider Workshop (cont. from p. 1)

then work on separating spiders at least to family. What does a cribellum actually look like? Or the epigynum? Can you see those hairs that are the trichobothria?

Spider enthusiasts young and old participated in the January workshop run by Jonathan Mays at the Forest Entomology Lab in Augusta.

Jonathan had an excellent pictorial handout with key characteristics for everyone to use as they looked at spider specimens. He also brought along a number of other references for people to peruse, and Tom Vining brought copies of the new *Spiders of North America.*

Two young entomologists, Brandon Woo and Sam Kenney, attended and spent part of their time exploring all the other interesting arthropods at the lab. They got to see some of their favorite insects and talk with others who share their passion for the smaller creatures of the world. We hope to see more of those two at future events.

When 2:30 pm rolled around I had to remind people that the workshop was ending. Everyone gave a hand in cleaning up the lab and all trooped out into the afternoon air dreaming of spring and collecting.

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Spider silk may be stretched as much as 1/4 its length before breaking. (The original bungi jumping?) The silk of Nephila *spiders is the strongest natural fiber known, and South Sea Islanders use the silk to make bags and fish nets.*

*The **Honeybee** is the official state insect of Maine - as well as of 11 other states, making it the most popular state insect in the country. The other states honoring honeybees are Arkansas, Georgia, Louisiana, Mississippi, Missouri, Nebraska, New Jersey, North Carolina, South Dakota, Utah and Wisconsin.*

The Brown Marmorated Stink Bug

by Karen Coluzzi

You know that long-legged bug that languidly lingers across walls, windows and whatever else it will cling to - the one that magically appears inside your house at the first sign of summer's end? The one that everyone asks about, and is duly impressed when you exclaim – oh, that's the Western conifer seed bug? Well, it may have some competition, or a friend, depending on how things play out.

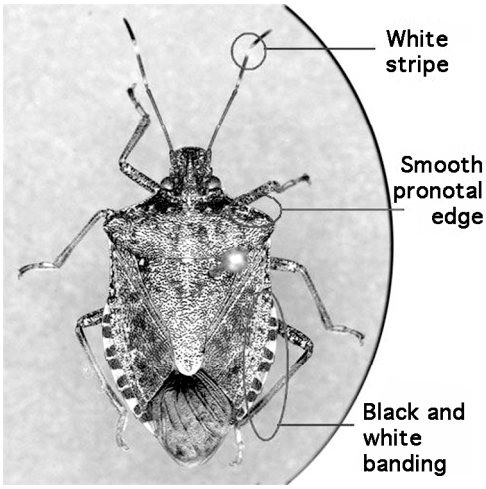
Another stinky Hemipteran has made its way into the United States and has been annoying homeowners in parts of Pennsylvania since 1996. Over the past ten years, it has increased its range, mostly around the mid-eastern seaboard (NJ, MD, DE, VA), but also has been reported out in Oregon. This new little stinker is the Brown Marmorated stink bug (BMSB), *Halyomorpha halys* (Hemiptera: Pentatomidae) and, although it flies well, likely spreads by hitchhiking on vehicles and through commerce. In fact, just last month, a woman living in Augusta, ME reported strange bugs emerging from her newly bought trailer.

Clay Kirby and Jim Dill, our fearless extension entomologists, inspected other trailers at the dealership by looking under seat cushions and in storage compartments and found more bugs. They suspected these to be *Halyomorpha halys*, and suggested that the woman and the dealership return the trailers to its distributor. Coincidentally, the distributor is located in a BMSB-infested town in Maryland. Rick Hoebecke, insect taxonomist extraordinaire at Cornell University, later confirmed that these bugs were indeed *Halyomorpha halys*.

Like the Western conifer seed bug, BMSB overwinters as an adult, seeking warm, cozy, protected areas in which to hibernate. In spring, the adults emerge, mate and lay eggs on the undersides of leaves. There are five nymphal stages, and in Pennsylvania and presumably the northeast, not more than one generation is completed in a year. Young nymphs are yellowish with red and black markings, and the older nymphs look similar to adults. Adult BMSB are approximately 17 mm long and have a characteristic alternating dark and light banding on the last two antennal segments. They can also be distinguished from a look-alike native of the *Brochymena* genus by the smooth pronotal margin.

Should we be worried if BMSB becomes established in Maine? Is it merely just a nuisance pest like its distant cousin, the Western conifer seed bug? The good news is, like the seed bug, BMSB is not harmful to humans. Unfortunately, unlike the seed bug, BMSB is a significant fruit tree and legume pest in its home range of China, Japan, South Korea and Taiwan.

In Pennsylvania and New Jersey, where BMSB presumably has resided the longest in the U.S., considerable plant damage has been reported. Fruit crops are especially vulnerable as the insect's sucking mouthparts cause pitting and discoloration of the flesh rendering the produce unmarketable. The host list in the United States is expanding as BMSB has been spotted feeding on leaves of butterfly-bush (*Buddleia spp.*), honeysuckle (*Lonicera spp.*), *Rosa rugosa*, and raspberry (*Rubus spp.*).



Key things to look for in identifying the Brown Marmorated Stink Bug

Because the stink bug initially feeds on common landscape ornamentals, it is likely that homeowners will be the first detectors. No one really knows how much damage this stink bug would cause to our plant life, but do we really want another unwanted houseguest, especially a stinky one? If you suspect you've seen the Brown Marmorated stink bug, please contact the Department of Agriculture, 287-7551.

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L. L. Bean Acadia Research Fellowship Program

The Schoodic Education and Research Center (SERC) and Acadia Partners for Science and Learning are pleased to announce the 2007 L. L. Bean Acadia Research Fellowship Program call for proposals.

This year's program will award a minimum of five grants (up to $5000 each) in support of research projects that advance the scientific knowledge of the parkâ€™s significant natural and/or cultural resources, the experiences of visitors and local residents who use the park, and the peoples who have lived in the Acadia region.

For detailed information on the Bean Fellowship Program and application instructions please review the "2007 Guidelines and Instructions" announcement on SERC website (http://www.nps.gov/acad/naturescience/sercresearch.htm).

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The greatest longevity of any living creature as a species can be claimed by the leaf beetle Plateumaris germari, *which feeds on emergent aquatic sedges. Fossils of this species have been found in the Green River Shale in Wyoming, from muds deposited in a lake some 50 million years ago! We have multiple species of this genus, though not this particular species, here in Maine.*

Equipment Review by Richard W. Hildreth

The idea of viewing insects with binoculars is a good one: get to see those butterflies nectaring at the flowers before you get too close and disturb them, check out those tiger beetles on the ground to decide which ones you need to collect, etc.

Until recently, the problem with this idea has been that most binoculars were not designed for close-focus use. The few that were available at a reasonable price were poorly made or had such a narrow field of view that they were difficult to use. A couple of the "high-end" binocular manufacturers offered good-quality close-focus glasses, but at a price over $1,000. Brunton produced a good-quality close-focus monocular, but it was a bit awkward to use.

Recently, Pentax has come out with a series of close-focus binoculars called *Papilio* to lure the butterfly watchers. I recently bought a pair of the 8.5x 21 *Papilio* binoculars and have carefully tested them in various field conditions. They are great! I think every field entomologist should have a pair.

They are a very small glass (but not too small to hold comfortably) and very light (10.2 oz.). They can be used one-handed. They are very close-focus: 1.6 feet (0.5 m). At 8.5 power and close-focus, the view of insects is spectacular, much like seeing them with a hand lens.

This is a center-focus binocular; the focus is very fast and smooth. The field of view is very good (315 feet at 1000 yards), so there is no trouble locating the target. The eye relief is good (15 mm). While these glasses are not designed to be birding binoculars, I used them with very good results on three recent Christmas Bird Counts.

Another good feature is the price. I bought my pair at B&H in New York City (www.bhphotovideo.com) for $129.95 + $8.40 for shipping. I called the order in and UPS delivered them to my house in Massachusetts the next day.

A couple of cautions. These binoculars are not waterproof (which means you can't throw them in the pond with impunity). While very well-constructed, I don't think they would stand up to really rough treatment. (Treat them with respect as you would any piece of optical equipment.) They come with a strap and a vinyl belt pouch. In the field, while not actually using them, it might be good to carry them in a Zip-Loc bag in your pocket.

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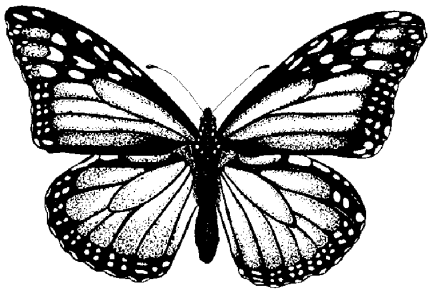

The monarch butterfly is the official state insect of three states - Alabama, Illinois, and Vermont.

Book Review by Richard W. Hildreth

Butterflies of the East Coast, an Observer's Guide
by Rick Cech and Guy Tudor; Princeton University Press, 2005; ISBN 0-691-09055-6, 8-3/4" x 11-1/4" x 1-1/8" thick, 345 pages.

This is a large, hard-cover book, printed on fine glossy paper with ~900 large-size color photographs. At first glance it appears to be just one of those lovely, expensive, "coffee table" books. More careful examination shows it to be a very detailed account of all the butterfly species regularly occurring along the east coast of the United States; anyone seriously interested in the butterflies of this area will want to have this book.

The first thing I liked about the book is the area of coverage, the east coast, which includes FL, GA, SC, NC, VA, WV, DE, MD, NJ, PA, NY and New England. Most books regarding eastern butterflies divide east and west with some arbitrary north-south line, commonly the 100th meridian. This results in a book filled with great plains, western, southwestern, even Mexican species as well as those from the Appalachians and the coastal plain. This east coast guide covers all the butterfly species on the Maine Checklist. It also covers all the species likely or possible that might stray into Maine from farther south.

The first 57 pages of the book are concerned with introductory material such as butterfly habitats, behavior, how to study butterflies, etc. This material is up to date and well-written.

The rest of the book contains the species accounts. I need to say right away, this is not a field guide in the usual sense, with images of similar-looking butterflies placed side by side for easy comparison. The species accounts are placed in taxonomic order beginning with the swallowtails; skippers follow the butterflies. English names used in this book follow the North American Butterfly Association Checklist, 2nd edition.

Each species account is given an entire page. For each species there are 2 or 3 (2" x 3-1/2") color photographs of the butterfly, taken in most cases of a living, free-flying individual in the field. Some photographs of spread specimens are included for species that don't normally spread their wings in the field. Each species account also includes 1 or 2 photographs of the major caterpillar food plant and/or the butterfly habitat. For each species there is a small, but clear, range map showing where the species is found within the east coast area.

The text of the species accounts includes the following sections: an introductory section, usually 2-4 short paragraphs about taxonomic issues, special habitat requirements, special behavior, etc. Identification: a short section gives the critical field marks of the dorsal and ventral surfaces. Habitat includes a short general description of habitat. Host plants: this means caterpillar food plants - the principal food plant species in the east coast region are identified. Occurrence: this category has to do with the conservation status of the species, whether it is a specialist or a generalist, etc. Finally at the

cont. on next page

Book Review (cont.)

bottom of each species account is a red line with an arrow point at each end. This line is the actual size (wingspread) of the species; the wingspread in inches is also given.

Rick Cech traveled around the east coast region and found most of the butterfly species included in the book and managed to get magnificent photographs of almost all of them. There is considerable experience behind this book.

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Keeping Track of Scaled Jewels: The Maine Butterfly Survey

by Phillip deMaynadier

I am pleased to announce that the long-anticipated Maine Butterfly Survey (MBS) is scheduled for flight in 2007! Sponsored by the Maine Department of Inland Fisheries and Wildlife, in partnership with the University of Maine at Farmington and Colby College, the MBS is intended as a 5-year, statewide, volunteer atlasing initiative. In addition to raising public awareness and concern for Maine's butterflies, and invertebrate conservation generally, the MBS will increase our knowledge of the distribution and status of over 115 species of butterflies and skippers statewide. Following in the tradition of previously successful state-sponsored wildlife atlasing projects, including most recently the Maine Damselfly and Dragonfly Survey (2005), data generated from the MBS will come primarily from citizen scientists like you.

We are fortunate in Maine to have a trained cadre of invertebrate enthusiasts among the many members of the Maine Entomological Society. As such, you are invited to participate in the first of several MBS volunteer workshops from 9:30 a.m. to 3:00 p.m. (catered lunch) on Saturday, April 28th, hosted in the Olin Building at Colby College, Waterville. Co-coordinated by Dr. Herb Wilson and me, the workshop will introduce volunteers to the basics of butterfly biology, identification, and MBS survey methods. A second 2007 volunteer MBS workshop will be held on Saturday, July 14th, at a location soon to be announced. Space is limited and reservations will be accepted on a first-come, first-served basis. Interested registrants for the April 28th workshop should send their name and contact details to Dr. Herb Wilson at whwilson@colby.edu or Department of Biology, Colby College, 5739 Mayflower Hill, Waterville, ME 04901-8857.

Phillip deMaynadier
Reptile, Amphibian, and Invertebrate Group Leader
Maine Department of Inland Fisheries and Wildlife
650 State Street, Bangor, ME 04401

phillip.demaynadier@maine.gov

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Wildflowers of New England

Learn the basics of wildflower identification so that you can place those butterflies and other insects on the right host plants. There will be a three-part workshop at the Delta Institute in Bowdoin on June 8, 15, and 22, from 11:00 a.m. - 3:00 p.m. For more information visit:

www.vfthomas.com/deltahome.htm . *Register early!*

An M.E.S. Scholarship Fund???

Interested in the Scholarship Committee?

The scholarship committee is looking for an additional one or two people to help develop ideas and details of a formal plan to be presented to the Board at the next annual meeting. The time commitment involved should be only about 5 hours per month. Interested persons please contact Gail Everett at 207-743-2840 or everett.gail@gmail.com.

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WORD SEARCH

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R C E F M N S O S U E R B A C K S W I M M E R T
L M P L E C O P T E R A M V O O S R N C A L I P
R A X Y G E M M O Z A N T X W O L D S O L O M I
S M A G G O T O N W I T N A E K O R T L L E A M
L O F F T C F L E A S O A S E R E M A L O Y Y S
P M R I J E S M F N L T D A V D O C R E P E Y T
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N E A M E L L I A P H I D S N T E A P F R B N D
E E U T D R L T L E S C A N T E N N A E O U R I
C B U G B M A N T I D K E E S B E T E M C A U S
S E T H U E R A E M O S Q U I T O T S U C O L F
Q U I C G K V C R I C K E T B N R C E R C I O L
W N F O X J A R E T P I M E H A U M P E D T O Y
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In the matrix above, find each of the following hidden words; words may read up or down, forwards, backwards, or diagonally in the matrix:

Plecoptera	Stoneflies	midge	fleas
beetles	spiders	Odonata	fly
spittlebug	butterfly	Gerridae	botfly
moth	Acrididae	antennae	weevil
chrysalis	vein	molt	locust
instars	pupae	aphids	bug
Acari	ticks	bumblebee	tarsi
honeybee	backswimmer	Mallophaga	cerci
bedbug	pheromone	mosquito	drone
wriggler	grub	ocelli	femur
gnat	earwig	pseudoscorpion	larva
palps	wings	compound eye	egg
haltere	lacebug (2)	cricket	firebrat
Collembola	caddisfly	maggot	mantid
Hemiptera	ant (and as everyone knows, if you see one ant, there's plenty more! The word "ant" appears at least 15 times in the matrix!)		

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Economic Value Contributed by Insects

According to a recent article*, the economic value added to the U. S. economy each year by insects comes to a whopping $57 *billion*, based just on native, non-introduced species. This means this estimate is actually minimal, considering the enormous importance of the imported domestic honeybees that are so essential to pollinating many food crops - many of which are themselves also introduced. Also excluded from the study were insects deliberately reared as predators, parasites or parasitoids on economic pests, such as *Trichogramma* wasps. According to the authors, the economic impacts of imported insects have already been well-studied and documented, and those are also taxa that will be unlikely to require special conservation efforts.

The four areas in which they evaluated insect economic impact were chosen mainly for the availability of data on these groups, as well as a reasonable means of assessing overall impacts. The functions evaluated were dung burial, pest control, pollination, and wildlife nutrition; not included were control of weeds, burial and decomposition of dead animal and plant matter, or improvement of the soil composition and structure by insects. Also excluded was the value of insect-derived products such as honey and beeswax.

Values were calculated based on what estimated costs would be to consumers for products should the functions of insects be deleted from the ecological web, or have to be performed commercially.

Dung beetles were calculated to contribute some $380 million to the economy, by lessening the impacts of livestock dung on forage quality, by reducing loss of nitrogen to the atmosphere, by reducing parasites and helping to control pest fly populations.

The role of honeybees in pollinating many food crops is well-known, but an estimated 90% of the U.S. crops of grapes, lemons, olives, strawberries, pumpkins and squash are pollinated instead by native bees. These, and the contributions of native bees to the pollination of other crops, is estimated to total some $3.07 *billion* annually. Crops benefiting most (in total dollar value) from native insect pollination are apples, grapes, strawberries, squash, alfalfa hay, cotton, and soybeans. Though for some of these crops (e.g., alfalfa hay) domestic bees only are estimated to effect some 5% of total pollination, the value of the total annual crop means their impact is indeed considerable overall.

The total value of averted crop losses as a result of native beneficial insects that are predators, parasites or parasitoids of native crop pest species was estimated at $4.49 billion.

The overall economic impact of insects on wildlife nutrition was calculated by the annual expenditures for recreational activities that center on wildlife taxa that rely on insects as a critical nutritional resource, and included hunting of migratory and non-migratory bird species, bird-watching, and both sport and commercial fishing. The estimated contribution of insects to these occupations and pursuits came to a total of $49.93 billion. Only two bird groups have 10 or more North American species that are strictly non-insectivorous: the Falconiformes (vultures, hawks and falcons) and the Charadriiformes (shorebirds and gulls).

As with many such studies, a lot of fundamental assumptions had to be made. For example, the value of insects to sport fishing (since most sport fishing in the U.S. is in fresh waters) was assumed to be equal to the total economic impact of all sport fishing, since all freshwater fish target species are wholly or partly dependent on insects in their diet. The value for commercial fish, which are mostly saltwater species, was calculated by multiplying the percentage that insects comprise of the total diet of that species during that portion of its life that it spends in fresh water, times the total annual tonnage harvested, times the economic price for that species in the open market. Even though for some species the insect consumption was a minute fraction of 1% of the total lifetime food intake (limited mainly to juvenile stages of growth), this still resulted in an estimated value of nearly $275 million to the economic value of the total annual catch. No estimate was provided as to the potential impacts on these industries should the insects NOT be present as a food resource for juveniles.

An interesting read, the paper should be available in most college libraries.

- Bob Nelson

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*Losey, John E., and Mace Vaughan, 2006: The economic value of ecological services provided by insects. *Bioscience,* v. 56, no. 4, p. 311-323 (April, 2006).

Summer Study Opportunities in Steuben

A whole host of summer seminars on various natural history topics are being offered this summer at the Humboldt Field Research Institute in Steuben. Those with a specific focus of entomological nature, with their respective hosts, include:

Aquatic Invertebrates: Taxonomy, Ecology, and Monitoring; June 17 - 23; Frederick H. SaintOurs, Jr. (fred.saintours@comcast.net)

Odonata: Adult Damselflies and Dragonflies; July 22 - 28; Ron Butler (butler@maine.edu)

EPT Taxa: Systematics and Biomonitoring: Ephemeroptera, Plecoptera, and Trichoptera; August 5 - 11; Steven Burian (burian@scsu.ctstateu.edu)

Many other seminars cover lichens, salt marsh restoration, coastal ecology, scientific illustration, etc. Descriptions of all the seminars offered this summer may be found at

http://www.eaglehill.us/semdescr.html

Information on lodging options, meals, and costs may be found at

http://www.eaglehill.us/mapinfo.html

There is a printable and online application form at

http://www.eaglehill.us/mapweb.html
http://www.eaglehill.us/mapprn.html

For more information, please contact the Humboldt Institute, P. O. Box 9, Steuben, ME 04680-0009. Phone: 207-546-2821; Fax: 207-546-3042; E-mail: office@eaglehill.us. Online general information may be found at

http://www.eaglehill.us

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Winter collecting? Are you crazy?

Most people think that collecting at this time of year is not really feasible here in Maine, with our unpredictable weather, frozen ground and plastic flowers all that are to be found. But using a Berlese funnel (like the one Chuck Peters described in one of last year's issues) on leaf litter can be surprisingly rewarding. Piles of leaves and lawn clippings from last fall are ideal, and can yield great rarities as well as many things not commonly encountered, such as fierce-looking pseudoscorpions, delicate lace bugs, etc. Collect even frozen materials and put them in the funnel, using an oversized container as catchment (to counter the flux of water from melting ice!). Turn on the light, then check back 12-24 hours later. You may be very surprised with what you get! - *B.N.*

Coming Events for 2007:
(see http://www.colby.edu/MES/ for more detailed information)

Saturday, 28 April - Waterville (Kennebec Co.) First Maine Butterfly Survey workshop at Colby; advance registration required. Contact Herb Wilson (whwilson@colby.edu) or Phillip deMaynadier (phillip.demaynadier@maine.gov) for more information.

Are YOUR dues paid for 2007?

Check your mailing label to make sure!
If it says 2006 in the upper-right corner, this will be your LAST newsletter until you're paid up to date!

Coming Events for 2007 (cont.) :

Saturday, 19 May - Bowdoin (Sagadahoc County). Combined Workshop and Field Day at the Delta Institute of Natural History; contact Tom Vining (info@vfthomas.com) by phone at (207) 266-5748) for more information.

Saturday, 9 June - Deering Pond, Sanford (York County). For additional information, contact Chuck Lubelczyk (at 207-662-7142) or Gail Everett everett.gail@gmail.com or 207-745-2840.

Saturday, 23 June - Steuben (Washington County). MES Field Day. Richard Hildreth will coordinate this - contact information hopefully will be available before then!

Saturday, 14 July - 2nd Maine Butterfly Survey (MBS) workshop; location not yet set, but advance registration will be necessary. Contact Phillip deMaynadier (phillip.demaynadier@maine.gov) for more information.

Saturday, 18 August - Rock Ridge, Clinton (Kennebec County). Field collecting day. Contact Bob Nelson for more information, by phone at 207-859-5804 or by e-mail at beetlebob2003@yahoo.com .

Saturday, 15 September - Annual Meeting, to be held once again at Chuck Peters' home in New Gloucester.

September (exact date yet to be determined) - Bug Maine-ia at the Maine State Museum. Contact Marion Smith at the Maine State Museum, at (207) 287-2301, for more information.

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