

# Moths and Butterflies (Lepidoptera): Identification, Specimen Preparation and Taxonomy

July 12 - 18, 2015

## General Seminar Information

This seminar is designed for students at nearly every scale (pun intended). With two instructors — one specializing moths, one in butterflies, and together offering an array of field and lab instruction — the course is rigorous yet flexible. Any student seeking a general introduction to butterflies, for example, can be as busy as a lepidopterist looking to advance with particular macro-moth taxa. Seminar participants can allocate their time to any aspects of this order: moths, butterflies, field photography, specimen collection and preparation, taxonomy, or all or part of the above. Our broad approach to learning generally features:



- ◆ Morning lectures on ecology, conservation, taxonomy and family- and genus-level characteristics.
- ◆ Afternoon outings for field identification of macro-lepidopterans, net-and-release techniques, specimen collection, photography, or your own field aspirations.
- ◆ Hands-on sorting, identification, and, if requested, dissection of moth specimens trapped during the seminar.
- ◆ Sleep deprivation owing to late nights with an abundance of live moths at UV lights.
- ◆ Hours in the blissful company of moth photographs or trays full of specimens.
- ◆ A more leisurely pace at wonderful field sites (from bogs to woods roads to wildflower meadows) in the company of these insects.

In short, students can complete this seminar without ever having to swing a net or touch a specimen, or by netting or trapping specimens and assembling their own reference collections. Although we will generally learn as a group, Hugh McGuinness will take the lead on moths in lectures, in the field, and at lights and traps at night (including night photography); Bryan Pfeiffer will cover butterflies in lectures and during field outings (including the finer points of net or binocular technique) and is the seminar's lead instructor for field photography.

## Instructors

**Dr. Hugh McGuinness** (hdmcguinness@gmail.com) received his Ph.D. in Ecology and Evolutionary Biology from the University of Michigan in 1987. A former faculty member at Friends World Program of Long Island University, he currently teaches science at Maret School in Washington, DC. He also does volunteer curatorial work in the moth collection at the Smithsonian Museum. Since 2004 he has worked as a consultant for The Nature Conservancy conducting surveys of moths to evaluate land management practices and to document the occurrence of rare species. His current research focuses on using moths as indicator species in successional habitats, the spread of introduced Lepidoptera, various aspects of Lepidopteran taxonomy and systematics, and documenting Lepidopteran biodiversity on Long Island, NY, where he has encountered more than 1000 species of moths. He lives in Washington, DC, with his wife and two children.

Although he is most certainly a field entomologist, **Bryan Pfeiffer** (bryan.pfeiffer@uvm.edu) is probably more of a teacher at heart. Over the course of three decades, he has lectured and guided people in the discovery of birds and insects. As a consulting field birder and entomologist, Bryan has worked for governments, timber companies, private landowners, and conservation groups. Bryan was a co-founder of the Vermont Butterfly Survey and its principle field lepidopterist, which means he spent six years chasing butterflies around Vermont. Bryan has collected, watched, and photographed butterflies from the tropics of Central America to above the Arctic Circle in Scandinavia. He now teaches professional writing to graduate students in the University of Vermont's Field Naturalist and Ecological Planning Programs.

**Class limit:** 16 participants

**Seminar location:** Steuben, Maine, and nearby field sites

## Lectures, Lab and Field Schedule

Lepidoptera has the potential to be a 20-hour-per-day pursuit. Our days will generally begin at 9 AM, however, with lectures and the “Daily Moth Dump,” which is either an abundance of specimens for sorting or a huge screen-shot image of moths waiting to be identified. On most days, we’ll be in the field after lunch. Starting at 8 PM, after supper, you’ll have the option for individual pursuits with specimens or to work on photography. The seminar’s “second field session” of the day starts at 9 PM, when moths begin to arrive at our light stations. Because prime time for moths may run until 1 AM, students who stay out late will have options for down time each day. In general, Hugh and Bryan can be flexible once we know your preferences and goals for the seminar. Because weather and sleep play a huge role in the pursuit of these insects, the following is only a tentative agenda; it will most certainly change:

### Sunday July 12

- Afternoon to early evening: informal greeting and getting acquainted
- 7 PM – Supper
- 8 PM – A general discussion of the course, who we are, and our objectives
- 9:30 PM – Lighting for moths at Eagle Hill

### Monday, July 13

- Morning Presentations and Discussions:
  - Basic Lepidoptera Anatomy (Adults) and Life History
  - Moth Families - I
  - Butterfly Families
  - Daily Moth Dump: Family-level sorting session from specimens or an on-screen photo
- 12:30 PM – Lunch
- Afternoon
  - Field outing near Eagle Hill: Net technique, field observation and optional collection of moths and butterflies
- 7 PM – Supper
- 8 PM – Preparation and Mounting Specimens - I or Fundamentals of Field Photography
- 9:30 PM – Moths at the lights and traps



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### Tuesday, July 14

- Morning presentations and discussion:
  - Basic Lepidoptera Anatomy (Larvae)
  - Moth Families - II (and More Macro-moths)
  - Daily Moth Dump: Family-level sorting session from specimens or an on-screen photo
  - Hesperidae Butterflies (Skippers)
- 12:30 PM – Lunch
- Afternoon Options:
  - Field Outing: Moths and butterflies (including larvae)
  - Discussion: Traps and collections
- 7 PM – Supper
- 8 PM – Preparation and Mounting Specimens - II or Lepidoptera Field Photography
- 9:30 PM – Moths at the lights and traps

### Wednesday, July 15

- Morning presentations and discussion:
  - Anatomy of Sex: Lepidoptera Mating Systems
  - Moth Families - III
  - Introduction to Families of Micro Moths
  - Daily Moth Dump: Family- and genus-level sorting session from specimens or an on-screen photo
- 12:30PM – Lunch
- Afternoon Options:
  - Field Outing: Peatland Moths and Butterflies at either Jonesport Heath or Corea Heath
- 7 PM – Supper
- 8 PM – Specimen or photography work
- 9:30 PM – Moths at the lights and traps

**Thursday, July 16**

- Morning presentations and discussion:
  - Ecology of Lepidoptera: Leps as the “Meat and Potatoes” of Terrestrial Ecosystem
  - Lepidoptera Conservation – Designating Rare Species or Others Worthy of Conservation
  - State and Regional Lepidoptera Survey and Monitoring Projects
  - Daily Moth Dump: Family- and genus-level sorting session from specimens or an on-screen photo
- 12:30PM – Lunch
- Afternoon Options:
  - Field Outing: Lepidoptera of Sedge and Other Wetlands
- 7 PM – Supper
- 8 PM – Specimen or photography work
- 9:30 PM – Moths at the lights and traps

**Friday, July 17**

- Morning presentations and discussion:
  - Lepidoptera Evolution
  - Lep-based Field Studies with a Focus on Basic Biology and Conservation
  - Daily Moth Dump: Family- and genus-level sorting session from specimens or an on-screen photo
  - Dissection (if interested warrants)
- 12:30PM – Lunch
- Afternoon:
  - Field Practicum
- 7 PM – Supper
- 8 PM – Specimen Work and “mop-up” discussions and instruction
- 9:30 PM – Moths at the lights

**Saturday, July 18**

- Morning discussion
- Departure after breakfast

**Books, Field Guides and Other References**

The following field guides are highly recommended (depending on your own interests for the seminar):

**Moths**

- Covell, C. 2005. Field guide to eastern moths. Virginia Museum of Natural History. ISBN: 1884549-22-5
- Beadle, D. & S. Leckie. 2012. Peterson Field Guide to Moths of Northeastern North America. Houghton, Mifflin, Harcourt. ISBN: 978-0547238487

**Butterflies**

- Glassberg, J. 1999. Butterflies through Binoculars, The East. Oxford University Press. *or*
- Brock Jim and K. Kaufman. 2003. Kaufman Focus Guide to Butterflies of North America.

**Larvae**

- Wagner, D. L. 2005. Caterpillars of eastern North America: a guide to identification and natural history. Princeton University Press. ISBN13: 978-0-691-12144-4

**Techniques**

- Winter, W. D., Jr. 2000. Basic techniques for observing and studying moths and butterflies. Memoirs of the Lepidopterists' Society No. 5. ISBN 0-930282-07-8. Available through Lepidopterists' Society for \$44 (\$29 for members)

**Suggested reference books:**

- Borror, D. J., C. A. Triplehorn and N. F. Johnson. 1989. An introduction to the study of insects, 6th ed. Harcourt Brace Jovanovich College Publishers. ISBN 0-03-025397-7
- Handfield, L. 2010. Les Papillons du Quebec. Broquet inc. ISBN 9782896542451 (in French; get the identification guide, not the scientific version unless you are a full-fledged fanatic).
- Scoble, M. J. 1995. The Lepidoptera: form, function and diversity. Oxford Univ. Press. ISBN 0-19-854952-0
- Cech, R. & G. Tudor. 2005. Butterflies of the East Coast: An observer's guide. Princeton University Press ISBN 0-691-09055-6
- Scott, James A. 1992. The Butterflies of North America: A Natural History and Field Guide. Stanford University Press.

**Web References:**

- <http://mothphotographersgroup.msstate.edu/MainMenu.shtml>
- <http://www.butterfliesandmoths.org/>
- [http://www.cbif.gc.ca/spp\\_pages/misc\\_moths/phps/mothindex\\_e.php](http://www.cbif.gc.ca/spp_pages/misc_moths/phps/mothindex_e.php)
- <http://bugguide.net/node/view/15740>
- <http://mbs.umf.maine.edu/Butterfly%20Species%20List.htm>
- <http://www.naba.org/chapters/nabambc/index.asp>

**Field Clothing and Gear**

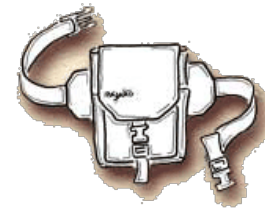
Wear standard field attire (muted greens, tans, browns, grays or camouflage are best) and plan for occasional wet feet. Because we'll visit wetlands on occasion, quick-dry nylon pants are highly recommended. Other important points about field clothing for Lepidoptera:

- **Footwear** – You can elect to keep your feet dry throughout this seminar, but we will occasionally visit wetlands, particularly bogs, for moths and butterflies. Old lightweight boots, beat-up tennis shoes or specialized water sandals or water shoes are fine. High rubber boots will often work for pursuing butterflies and moths, but in some bogs you run the risk of water higher than your boots or water pouring in when you kneel for macro photography or close looks at plants and insects.
- **Field Vest** – If you like to use a vest, bring it; but it's not necessary for this seminar. At most, you'll carry a field book, a field guide, and a box for your specimens (if you choose to collect or temporarily hold leps for identification later "on the shore"). For many of us, a standard field bag on a belt or a lumbar (fanny) pack will hold most of the field supplies we need (see below).

**Field Supplies**

- **Field Bag** – If you'll be collecting leps or doing catch-identification-and-release of butterflies, you'll need something easily accessible for holding live specimens. Your best bet is a field bag worn around your waist that holds your specimen box, glassine envelopes, a field book and pencils, and a field guide. One option is a Pajaro brand field bag or something similar:

<http://www.pajaro.com/fieldbag.shtml#original>. Also check Army surplus shops for field bags.



- **Specimen Box** – If you'll be catching butterflies for specimens or for identification-and-release, you'll need a sturdy box to hold your live subjects in glassine envelopes measuring 3" x 5". Don't get a box more than one or two inches deep (so that it can fit easily fit into your field bag). Plastic or aluminum is fine. One or two of these is required unless you do not plan to catch any butterflies.



- **Flat-tipped (Stamp Forceps)** – If you prefer to catch, identify, and release butterflies, get a pair of pair of flat-tipped forceps. You'll learn a rapid field survey technique for safe extraction of your butterfly from a net in order to grab a quick photograph for identification later or for a photo voucher.



- **Insect Net** – Although it's not required, a net will help you learn during this seminar. Most lep nets are 15" in diameter. Consider spending a bit more for a telescoping handle. If you plan to order a net, DO IT NOW; don't wait until the last minute or you may be without your own net during the seminar.

- **BioQuip** (<http://www.bioquip.com>)
- **Atelier Jean Paquet** (<http://www.atelierjeanpaquet.com/en/default.aspx>)
- **Rose Entomology** (<http://www.roseentomology.com>) – Expensive (but nice) insect nets

## Lab Supplies

We will have some lab equipment for making specimens, including pins, spreading boards, etc. If you plan to collect many specimens and build a reference collection, however, please bring your own materials. Contact Hugh if you have any questions about specimen supplies.

## Other Supplies and Lab Materials

| Mandatory  | Highly Recommended   | Optional   | To Be Supplied for You   |
|--|--|--|--|
| <ul style="list-style-type: none"> <li>Daypack</li> </ul>      | <ul style="list-style-type: none"> <li>Field book and mechanical pencils or pens for notes in the field</li> </ul>                                   | <ul style="list-style-type: none"> <li>Camera (even if you're not attending for photography)</li> </ul>              | <ul style="list-style-type: none"> <li>Glassine envelopes for field use</li> </ul>   |
| <ul style="list-style-type: none"> <li>Water bottle</li> </ul> | <ul style="list-style-type: none"> <li>Dissecting Scope (if you happen to have one and care to bring it; we'll have other scopes on hand)</li> </ul> | <ul style="list-style-type: none"> <li>Bug dope, sunscreen, personal first aid, GPS unit, laptop computer</li> </ul> | <ul style="list-style-type: none"> <li>Ethyl acetate, killing jars and other supplies for specimen collection and preparation</li> </ul> |

## Credits and Grading

### College/University Credits

Most participants will be taking this seminar for reasons other than degree purposes. Nonetheless, participants may obtain credits through their own college or university by way of an agreement for transfer of credit. We can supply your institution/advisor with a course syllabus and instructor(s) Curriculum Vitae. Such an arrangement must be finalized before arrival at Eagle Hill. Five-day seminars generally qualify for 2 university credits. You will need to work with the instructor(s) in advance to the seminar to determine the grading criteria. If interested, notify Marilyn (marilyn@eaglehill.us) at least 3 weeks before the seminar. Note, there is a \$50 fee.

### CEU (Continuing Education Credits)

Seminars related to professional duties of teachers and field biologists qualify for continuing education units (recertification credits). Notify Marilyn upon your arrival. Note, there is a \$50 fee.



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