

Arrangement and Procedures for the Entomological Museum of the Tom Ridge Environmental Center at Presque Isle

Arrangement of Orders and Families:

The Entomological Museum in the Tom Ridge Environmental Center (TREC) is arranged according to *Borrer and Delong Introduction to the Study of Insects* by C. A. Triplehorn and N. M. Johnson (2005). Insect specimens are arranged phylogenetically by order, then alphabetically by family.

There are four cabinets for voucher specimens that will be arranged alphabetically by order, then alphabetically by family within the order. Specimens will be stored in two prep cabinets until they can be placed in the correct family cabinet and recorded in the accession data ledger as well as the computer database.

The intent of the entomology collection is to have three different categories of use and storage: voucher, synoptic, and working.

- ⌚ Voucher Collection- contains verified specimens that are only used in the natural history collection by qualified experts and are never available for loan
- ⌚ Synoptic Collection- contains specimens with complete collection data and in good condition for academic use and available for loan
- ⌚ Working Collection- contains specimens that may have incomplete data or are not in superior condition and are available for use by school groups and other inexperienced groups; specimens in excellent condition but lacking complete data may be used in exhibits

Labels:

Labels for **pinned** specimens will be made of 36 pound Perma/Dur buffered, acid free ledger paper. (source: archivalsupplies.com or conservationresources.com) Labels should not exceed 15 x 7 mm with text printed at 3-4 point. Labels stored inside envelopes (i.e., Odonata) should not exceed 50 x 50 mm and typed with laser printer or written with pigma pens, which are acid-free.

Labels for specimens stored in **alcohol** will be made from PermaDur paper and laser printer (until ETOH fast ribbon is available, then printed on 28 pound Resistal Byron Weston. (source: archivalsupplies.com) and printed with an Epson LQ 510 (570e/300?) Impact Printer using an alcohol fast ribbon. (source: SPNHC collections group))

The label format is:

PA: Erie County
Geographic coordinates
Collecting locality
Date of collection
Name of collector

On reverse side:

Collecting method
Habitat
Behavioral notes

Generally no more than 6 lines of data should be on a single label.

Using standard pinning blocks, the specimen will be at 25mm; the locality-date-collector label will be at 16mm; the determination label will be at 9.5mm. Use pin # 3,2 1,0 depending on the size of the insect. For the various orders use the following positions:

COLEOPTERA: pin near the proximal end of the right elytra a short distance from the midline.

DIPTERA: pin through the mesonotum of the thorax to the right of the midline a short distance in front of the scutellum.

HEMIPTERA: pin through the scutellum to the right of the midline.

HOMOPTERA: pin through the thorax behind the middle on the right side.

HYMENOPTERA: pin through the thorax between the base of the forewings and to the right of the midline.

ODONATA: pin through the midline of the thorax between the bases of the forewings. Spread wings on spreading board.

ORTHOPTERA: pin through the posterior part of the thorax toward the midline.

Most other insects pin through the thorax between the forewings to the right of the midline.

A diagram showing the proper pinning methods for each order is in the appendix.

Specimen cataloging and placement in the collection:

After specimens have been accurately labeled, pinned specimens and those in alcohol are ready for placement in the prep cabinets. Specimens will be recorded in the accession ledger and in the computer program database. At that time their location, by cabinet and drawer, will be determined. Some may go into the voucher collection. Others will be placed in appropriate family drawers. **Unidentified** material will be placed at the end of the respective order or the family.

Collection Procedures:

When collecting specimens for the **voucher collection**, three specimens of each sex should be collected. **Voucher photos** are acceptable as long as they show the identifying characters for positive identification, and all data found on a pinned specimen is available.

Material that is not freshly collected:

The insects are placed in a -20° C freezer for decontamination using the following procedures:

- ⌚ Insect specimens/drawers are sealed in two plastic bags and placed in the freezer for 48 hours.
- ⌚ Still sealed in the bags, they are left at room temperature for 24 hours.
- ⌚ Specimens and/or drawers are returned to the freezer for another 48 hours.
- ⌚ After removal from the freezer the final time, the specimen drawers are left sealed in the bags to acclimate for 48 hours.

This procedure must be followed when specimens are not immediately accessed into the museum (it is presumed that specimens freshly collected in killing jars will be pest-free), when specimens are accessed from another museum, or when specimens are taken off the premises.

Odonata:

A representative number of Odonata should be spread and stored in specimen drawers. The majority should be placed in mylar envelopes and stored vertically in the appropriate drawers. Color patterns can be retained if the envelopes with the specimens are placed in acetone. This should be used in a fume hood. Specimens are left in the acetone for 24 hours. After draining the acetone from the envelope, they should be allowed to dry in a fume hood. Acetone should be replaced after four to five uses.

Procedures per Jerry McWilliams

Preparing and Preserving Odonata Specimens with Acetone

Acetone is a solvent that can be used to preserve specimens permanently. It also decreases and helps retain the natural colors of odonata specimens. Acetone can be purchased at most hardware stores. As soon as the insect is captured, place the live specimen in a glassine envelope. The specimen should be kept alive until it can be placed into the acetone bath, because the natural colors fade quickly. It is important that the specimen is not stored in direct sunlight or in a very warm environment to facilitate keeping it alive. Write the collecting data on the envelope in pencil because acetone will dissolve ink.

A wide-mouth glass jar or metal container should be used for the acetone bath, since some plastics used in plastic containers will react with the acetone. There should be enough acetone in the container to submerge the specimen completely. The container's lid should have a tight to avoid evaporation. Since acetone is toxic to inhale, the work space should be well ventilated. Place the glassine envelope, with the live specimen inside, into the acetone.

Once the specimen is submerged it will be quickly dispatched. After all movement has ceased, remove the envelope and specimen from the acetone bath. The acetone will set the specimen in a permanent position, so it is important that the as soon as the specimen is dead it should be removed from the acetone bath and envelope and positioned correctly. Carefully position the wings together over the thorax and straighten the abdomen. Then place it back in the envelope. It may be easier to position the abdomen after the specimen is placed back in the envelope by holding the envelope open and positioning the abdomen with a pair of forceps. Carefully place the envelope with the specimen back into the acetone bath, being careful not to move the abdomen out of the corrected position, and leave it for several hours to two days depending on size and fat content of the specimen. Damselflies will usually set overnight, while larger dragonflies like the darners tend to be very fat and should be left in the bath for a couple of days.

Once the envelope with the specimen has been removed from the acetone bath the specimen is removed from the envelope to air dry. Acetone evaporates quickly, so it will only take a few minutes before it is ready to be placed in a permanent envelope.

Remember that no part of the specimen can be moved since it has been permanently preserved in the position that was set when placed in the acetone bath. Clear envelopes specifically made for storing Odonata are available at Bioquip. These envelopes are made to accommodate a 3" X 5" index card that is placed inside the envelope. The index card prevents the envelope from being bent, which could damage

the specimen. Data can be written in pencil on the index cards or on an insect label of acid-free paper that is placed inside the clear envelope. The envelope with the specimen should be stored in a dark, stable environment that is in a sealed container to prevent insect damage.

Specimens on spreading boards:

Spreading boards should be placed in a designated tub that can be closed tightly and placed in a fume hood. This tub should have a no-pest strip in it to avoid contamination from dermestid beetles or other pests.

Entomological maintenance:

Once a year all drawers should be checked visually for dermestid beetle activity. Any suspect drawers should be quarantined immediately and placed in the freezer, following the freezing procedure outlined above. This date of inspection will be recorded inside the cabinet.

Loan Procedures from the Tom Ridge Environmental Center section of Entomology

1. People unfamiliar with our loan procedures should **read this carefully** and follow the checklist at the end of this section
2. For **pinned** specimens, find the material requested for loan, and insert a blue adhesive dot (placed on a pin) into the collection in place of the loaned specimens. A second pin will be placed next to the blue-labeled pin with the invoice number recorded on the label.
3. For **alcohol** specimens affix a blue adhesive dot onto the appropriate vial lid, or on the lid of a replacement (empty) vial if the whole vial of specimens is loaned. There must be at least five specimens in the collection if a loan is to be made. Specimens in excess of five may be loaned but the quantity to be mailed should be negotiated with the person at the borrowing institution for the number and the time to be loaned . This time should not exceed 6 months.
4. A list of the specimens will be recorded in the loan book, and will include the TREC accession number, the identification (genus, species if known), nature of each specimen (pinned or alcohol), and condition of specimen. For alcohol specimens indicate only 70% ETOH is acceptable for storage.
5. The information is also typed on an invoice sheet (computer form) and printed in triplicate. A white copy and a yellow copy are mailed to the borrower at the time the specimens are shipped (see numbers 10. and 15. below); a blue copy is retained in the loan file. Once specimens reach their destination, the white copy should be returned to the TREC museum to indicate the safe arrival of the shipment.
6. Consult the loan book for the number to be placed at the top of the invoice. Since this is outgoing material the number should start with an “X”, followed by the year, and the next unused number (e.g. X-2005-01). Enter all information in the fields requested in the loan record book and in the computer form.
7. The upper left hand side of the invoice should be filled out to indicate the name of the institution of the borrower and his/her address, and then made to the borrower’s attention. Loans are always made to institutions, not to individuals. Value of shipment depends on the projected cost of replacing the specimens being shipped, up to the current U.S. Postal Service insurance maximum of \$500.00.
8. Specimens are usually sent by post using “Library rate” for domestic packages. UPS can be used for fast service and for overnight use Federal Express. UPS will require forms filled out in duplicate.
9. It is advisable to do all paperwork prior to the actual packaging of the specimens. The material is then accessible for checking against the written invoice. Take the time to check the invoice and avoid embarrassment later.

10. Prepare a brief note to the borrower indicating that you will be mailing the loan **under separate cover**. Along with this note **send the white copy** of the invoice so that the borrower will know what to expect. You might reiterate that this copy should be checked against the shipment for new damage and returned to the TREC museum after the specimens are inspected.
11. Check to see if a collecting permit exists for the specimens and record that in the loan catalog.
12. Packaging of the specimens is flexible, dependent upon the nature and the quantity of specimens to be shipped. Use boxes that are non-crushable with pinning foam in the bottom for pinned specimens. If specimens are preserved in alcohol, great care should be taken to prevent leakage. Vials should each be wrapped individually in paper towels and then sealed in plastic bags.
13. Before closing the box, a mailing label indicating destination and "return postage guaranteed" should be included **inside** the package.
14. Apply another mailing label to the **outside** of the box. Labels should be made out to the institution of destination and to the attention of the borrower.
15. On one side of the box an envelope marked "INVOICE" should be attached. The envelope should contain the **yellow** copy of the invoice.
16. Each side of the box should be stamped, "Biological Specimens, No Commercial Value, No Endangered Species.
17. Place the insurance receipt in the file with the blue copy of the invoice.
18. When acknowledgement of receipt of package arrives from the borrower, mark the date in the loan book and place the white copy of the invoice with the blue copy and the insurance receipt in the "**active** to other institutions loan file".
19. When loan material is returned, check off specimens listed on the invoice and log the receipt of specimens in the log book. Remove invoices from active file and place them into the file "**Loans closed**" for appropriate the appropriate institution that should be in alphabetical order.
20. Send a postcard to the borrower acknowledging receipt of specimens and mark this transaction in the loan book.
21. Specimens should be processed through the **freezing procedure** found earlier in this document. Remove the blue indicator notes when the specimens are replaced in the collection.
22. **Above all else, do not assume that you are the only person who will ever deal with this loan. Be careful to execute all phases of the job so that loose ends do not have to be deciphered later.**

CHECKLIST FOR MAILING EXTERNAL LOANS

1. Gather materials to be sent, inserting a blue note on pins or note on the vials in the place of specimens in the collection.
2. Make a list of TREC numbers involved into the loan book
3. Log the loan into the loan book and get an "**X**" number for the invoice.
4. Prepare the invoice on the computer form and print and place blue copy into "active loan" file.
5. Use the standard letter to the borrower and include the white copy of the invoice in an envelope ready to mail.
6. Pack specimens in the appropriate containers with sufficient material to absorb the possibility that your package could become a football... will this package survive that?
7. Enclose a mailing label before closing.
8. Put a mailing label on the outside of the container.
9. Wrap in brown paper, if needed.
10. Put a mailing label on top side of the container.
11. Enclose in an envelope marked "**INVOICE**", the yellow copy of the invoice and tape the envelope onto the side of the box.
- 12 Stamp with "Biological Specimens..." and get postage cost along with insurance amount.
- 13 Take to the post office, Fed Ex or UPS and get receipts for postage and insurance. Place the insurance receipt with the blue copy of the invoice in the "**active loan**" file.
- 14 When acknowledgment for receipt of specimens arrives, mark in the loan book and place the white invoice in the file with the blue one.
- 15 When specimens are safely returned, mark the log book, mail acknowledgment card and place all papers in proper "**Loans closed**" file.
- 16 **Process returned specimens according to the freezer protocol**, Then replace specimens in the collection removing blue notes used to explain absence.

Appendix

* The following images taken from *Study of Insects* (2005) by Triplehorn & Johnson

21 May 9

Pinning Insects

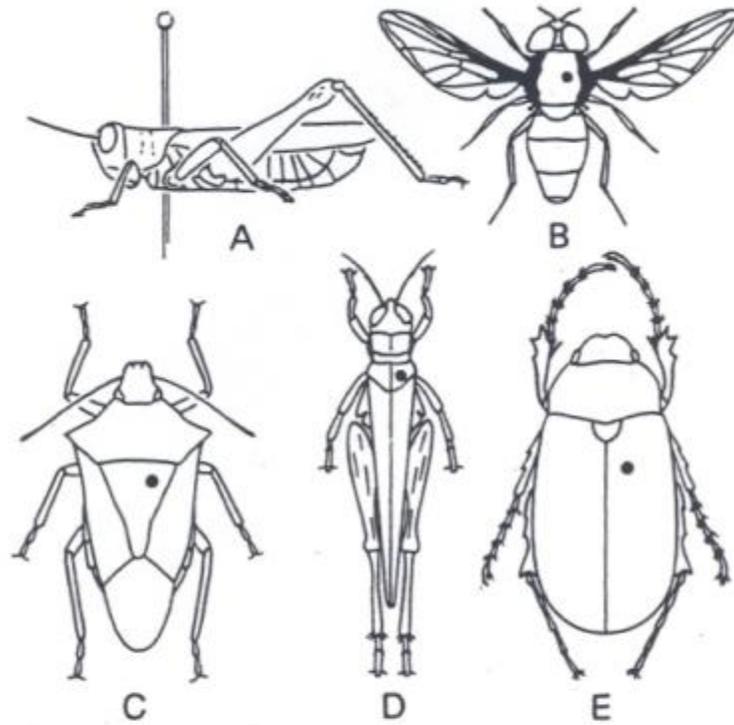
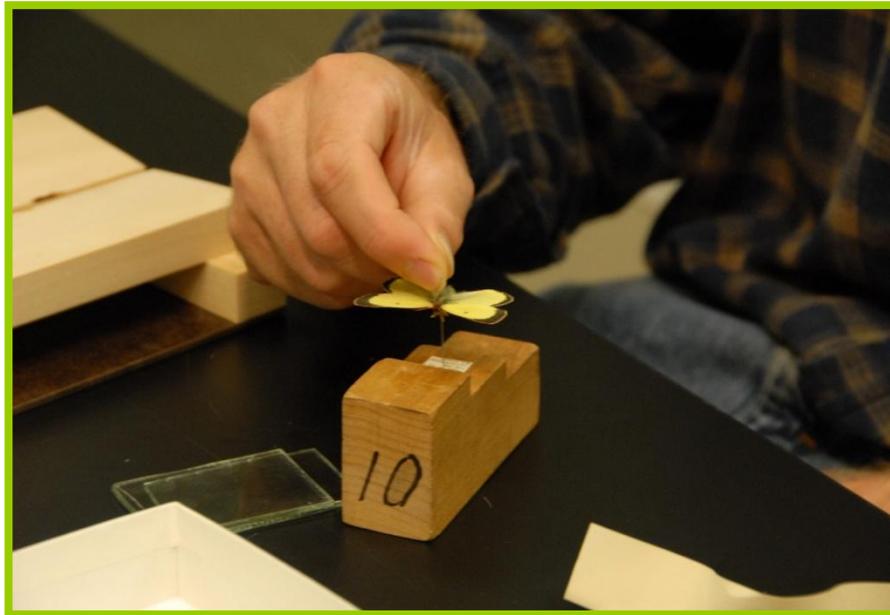
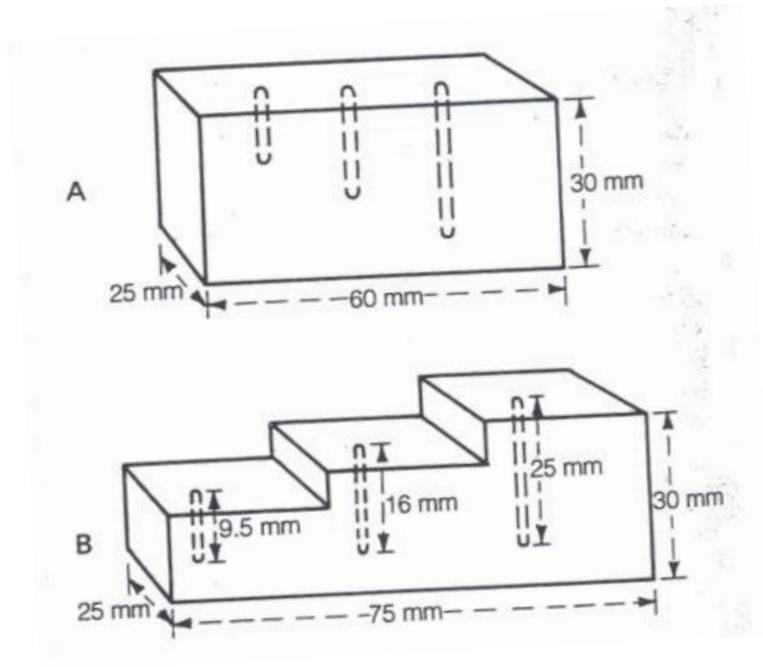


Figure 35-8 Methods of pinning insects. A, lateral view of a pinned grasshopper; black spots in the other figures show location of pin for flies (B), bugs (C), grasshoppers (D), and beetles (E). (Courtesy of the Illinois Natural History Survey.)





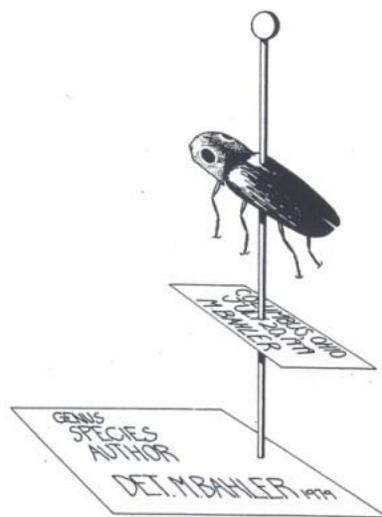
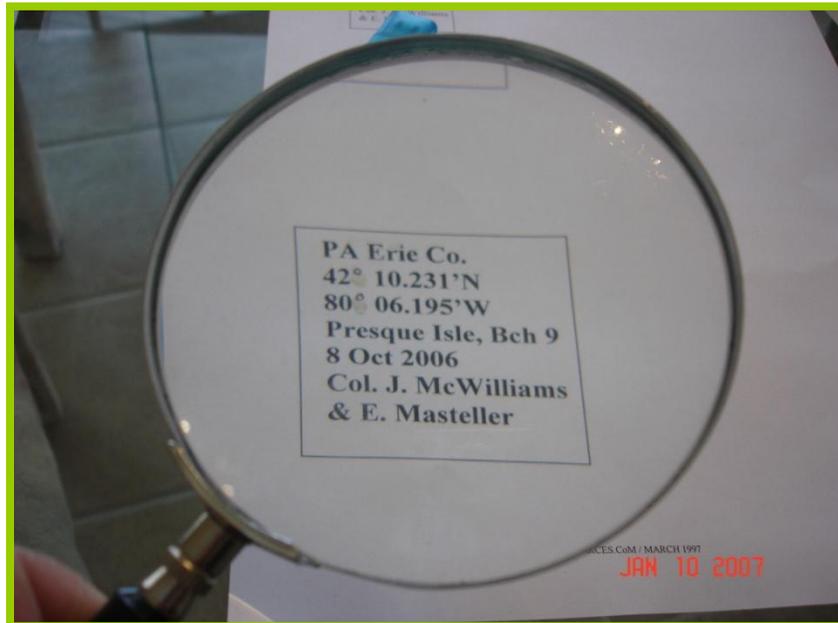


Figure 35-16 The identification label, giving the scientific name of the insect and the name of the person identifying the specimen.

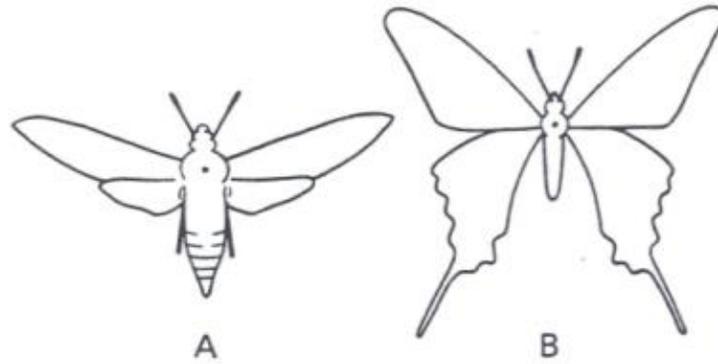


Figure 35-9 Pinning Lepidoptera. These insects are pinned through the center of the thorax, in both moths (A) and butterflies (B). (Courtesy of the Illinois Natural History Survey.)

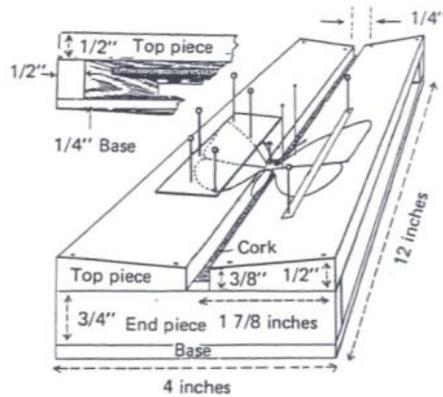
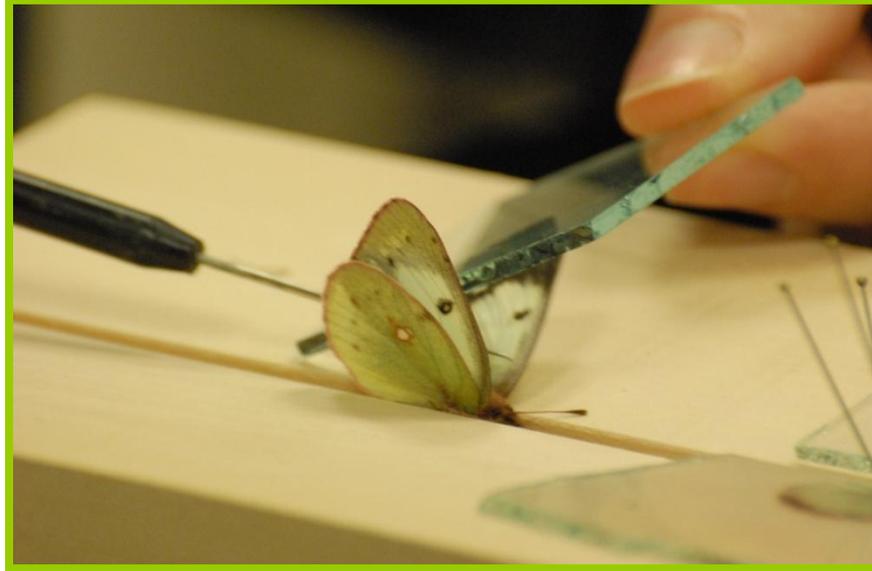
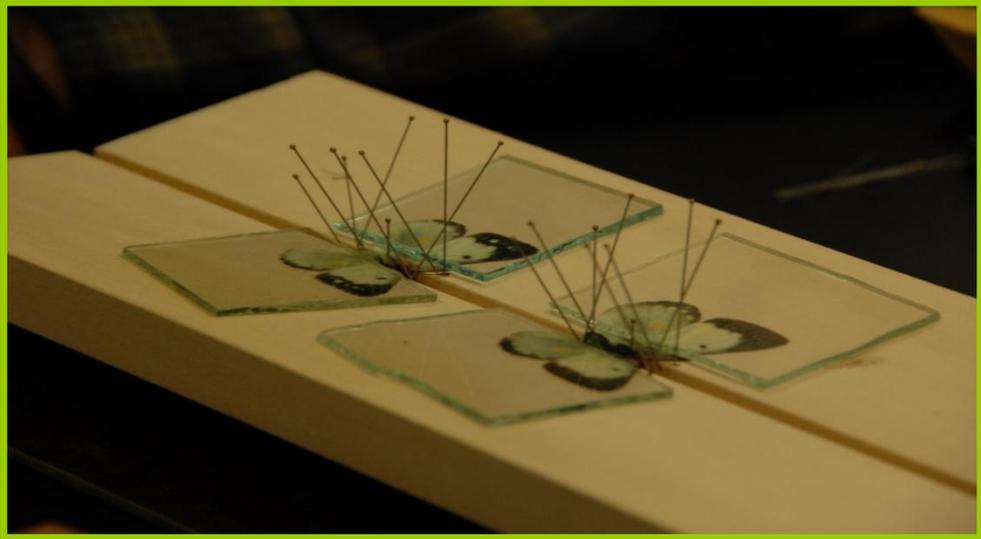


Figure 35-11 The spreading board, showing dimensions, details of construction (inset), and a spread specimen. The wings of the specimen can be held in place by a single, broad strip of paper as shown on the left wings, or by a narrower strip and pins as shown on the right wings. (Courtesy of the Illinois Natural History Survey.)





PA Erie Co.
04 Sep 2007
Presque Isle
Marsh Trail -
Cranberry Pond
N 42°09.773
W 80°06.678
E. C. Masteller

PA Erie Co.
27 Sep 2007
Presque Isle State Park
Pine Tree Trail(Bait Tr.)
N 42.170667°
W 80.089167°
Jerry McWilliams

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04 Sep 2007
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Marsh Trail -
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