Plant Collecting and Pressing

This semester, you will be collecting 15 specimens of BHSU campus trees. Of these, ten will be mounted on herbarium paper and submitted for grading and deposition into the BHSU herbarium or plant teaching collection. This assignment is worth 80 points (60 points based on quality of specimen preparations and 20 points based on diversity of plants sampled in terms of spatial distribution and taxonomic affinities). At the end of the semester, each student will display their favorite specimen, and classmates will vote on the "best in show." The top three finishers will receive extra credit! Pressed plants will be due in early October, and the mounted/labeled plant collection due in mid November. (Final due dates will depend on weather and access to BHSU laboratory space.)

Assessments of specimen quality will include the following criteria:

1. **Pressing quality:** all parts needed for identification present; some leaves turned over; plant looks “nice”; important diagnostic features evident despite specimen trimming or bending.

2. **Mounting quality:** label placed in bottom right corner; BHSU stamp on top; no excess glue; label oriented attractively on sheet.

3. **Labeling:** proper plant identification; no spelling or grammatical errors; appropriate site information and plant names.

4. **Field notes:** notes with appropriate collecting details such as tree tag number, GPS coordinates, collector(s) name, date of collection, site description, plant descriptions, etc.

5. **Photographs:** images of shrubs/trees that show details useful for identification.

**Equipment for Plant Pressing**

The following items are needed to assemble a functional plant press.

- Wooden racks (2)
- Straps (2)
- Cardboard sheets ("ventilators") (16 pieces)
- Newspaper (16 sheets)

Note the order of assembly is wood rack, cardboard, newspaper, cardboard, newspaper, cardboard .... newspaper, cardboard, wood rack—**cardboard should always be between wood rack and newspaper**, and you can use as many cardboard-newspaper layers as needed for a given plant collection project. Please wrap straps perpendicular to the long axis of the wooden racks (see image below), pull straps as tight as possible, and then tuck loose ends so they don’t dangle and become a tripping hazard.
Instructions on Pressing Plants

To ensure that plants dry flat, specimens are put in newspaper and placed between cardboard ventilators – and sometimes between blotters, absorbent cotton sheets used when collecting in humid climates – in a tightly strapped press. Only individual specimens should be placed within each folded newspaper sheet, so that collection information written on the newspaper is clearly associated with each plant in the press. Finally, the filled press is typically placed in an electric herbarium drier to expedite drying.

In the space below, the process of plant pressing is broken down into specific and discrete steps; please review all of these instructions before proceeding with pressing plant specimens!

• Lay a piece of newspaper on a piece of cardboard. Label the newspaper with plant collection information (your name, tree tag no., location on campus, tentative ID, etc.) with a pen or pencil.

• Arrange plant specimen so that it will fit on herbarium paper, which is approximately the same size and shape of a cardboard ventilator / folded sheet of newspaper. Remember to leave space on the bottom right corner for a label and space along the sides for a margin on the herbarium sheet!

• Use your best judgment to trim off unnecessary pieces of the plant specimen (e.g., overlapping leaves or parts that won’t lie flat). Consider leaving remnants of the trimmed tissue so that it is clear what was removed (e.g., keep leaf petioles on specimens to show alternate or opposite leaf arrangements). You want the herbarium sheet to capture the important identification features of the specimen! **With woody plants, specimens must show leaf type and arrangement on the branch – simple vs. compound leaf types, opposite vs. alternate arrangements, etc.** Quality preparation of plant specimens with large leaves, especially large compound leaves, requires careful planning during pressing.

• Flip several leaves over while pressing. (Species identification often requires inspection of features on both the front and back sides of leaves; unless you plan ahead during pressing, the latter will not be visible once the plant specimen is glued to the herbarium sheet!)

• Make sure reproductive parts (if any) are clearly visible.

• Make sure other potentially important features (e.g., buds, lenticels, leaf scars) are visible.

• It may be necessary to bend/fold the specimen to fit on the newspaper (and later, the herbarium sheet). However, as the Ramseys’ first botany professor said, “Respect the dignity of the plant.” Although looks aren’t the first priority for herbarium specimen, it is good for a mounted plant to look attractive, artfully arranged, and not overly crowded on the herbarium sheet.

• You may find fresh plant material to be frustratingly resistant to artful arrangement. If it isn’t cooperating, arrange plant parts as well as possible, and then squish them between cardboard for a few minutes or put them in the plant press for an hour or so; at that point, the plant may “behave” better.

• Close newspaper around specimen and put a piece of cardboard on top of newspaper. (Remember, there should be a cardboard on top and bottom of each specimen when it is put into the plant press).

• Repeat above instructions for other plant specimens, and then load them all into the plant press. Pull straps as tight as possible and place plant press in herbarium dryer, if it is available; otherwise, keep the plant press in a warm, well-ventilated area until it is placed in the herbarium dryer. Plant materials in a plant press will generally be fully dried after spending 3–5 days in the herbarium dryer.
How to collect plants

Before collecting plant specimens, gather needed supplies – your plant press (if you are pressing materials in the field); one or more large sacks or containers, such as garbage bags (if you are returning materials to a sheltered location for pressing); pens/pencils and pieces of paper (to label your materials on newspaper in the plant press or in your collection bags); and a sharp knife or clippers (to cleanly cut woody stems). In addition, you will want access to a cooler or a refrigerator if you will not be immediately drying your collected materials in the plant press.

Please, do not collect spruce!!!!!! The needles will fall off and make a huge mess. (Other conifers, like pine and juniper and fir, have much more persistent foliage – consider these as alternatives to spruce.) Moreover, you are advised to initiate collecting activities early in the fall semester, so the plants have not senesced their leaves too much or dropped their reproductive structures.

The cardinal rule in collecting is do no harm! Only collect from trees/shrubs that are large enough to sustain the loss of a branch (i.e., no small newly planted trees) and do NOT remove main branches on these plants. (In sampling of wild populations, careful consideration should be made for the number of individuals present at the site – could the collection have a significant demographic impact?)

Below are step-by-step instructions for collecting plant materials:

• Use a sharp knife or clippers to make a clean cut rather than tearing/breaking off branches.

• Collect a sample that has the parts necessary for identification—leaf arrangement, buds, fruit/flowers if available, and so forth. Choose a representative sample (not the "most unusual" or "easiest to reach") that will fill—but not overflow—an herbarium sheet.

• Make good collecting notes while you are in the field making collections. Note leaf arrangement, leaf colors and damage, bark characteristics, growth form, tag number, etc. Record the GPS coordinates.

• Take at least one photo that captures important features of each plant specimen—these often aid with taxonomic identification in the future, when the plants are pressed and mounted. As an added bonus, many phones will mark ("geo-reference") photos with GPS coordinates and time/dates.

• Press your collected plants as soon as possible. It can be challenging to press plants outside, so you may wish to bring the specimen inside; garbage bags work well for transporting plants. However, if you do this make sure you label each plant sampled during your collection effort!

• If it is not possible to press plants immediately after sampling, store materials in plastic bags that are appropriately sized; add a damp paper towel to the bag and keep in a shady place and refrigerate if at possible. Be warned that refrigerators have a nasty habit of freezing fresh plant material, depending on where it is stored; crisper drawers are much more reliable than far backside of shelves, in our experience. Collected materials that have frozen before pressing are generally un-useable as specimens.

• Label, label, label!!!! Make sure the bag or plant is clearly labeled with collection locality and date, and that this information is transferred to newspaper sheets in the plant press. If using collecting bags, small pieces of paper work well as labels; simply drop into the bag with a specimen.
Field Notes

A plant without documentation is essentially worthless as an herbarium specimen. Where and when was the specimen collected? Are there structures or features evident on the plant that cannot be represented in collected materials? Was the plant growing wild or tended under cultivation? You need to take notes on these kinds of issues while in the field, so the information is preserved and may be included with the label on the herbarium sheet. Waterproof notebooks ('Rite-In-The-Rain' paper) are often used for herbarium plant collecting; in this course, any paper notebook will be allowed.

Identify a "title" for your entire notebook: Indicate that these are field notes for 2017 Dendrology course, and that this collection is from the BHSU campus. Include country, state, and county.

Record this information for each specimen, as follows:

• Give each plant a collecting number and record this in your notes. For this class, you will use your last name and number plants consecutively: Ramsey 1, Ramsey 2, Ramsey 3, etc.

• Record the campus tree tag number (if tag is present) and your best guess at species identification.

• Record the date of collection

• Record important information about the plant that will be lost once it is dried or that isn’t evident from the collected sample (e.g., flower color, foliage odor, growth pattern, bark color/texture, health status).

• Record the spatial location. Include enough information for future researchers to locate the tree/shrub, including GPS coordinates but also the identity of nearby buildings and other landmarks.

• Include a habitat description, such as other plants that are present at the collection local, evidence of irrigation (or lack thereof) in the vicinity of the tree/shrub, and so forth.

• Record the identity(s) of the collector(s). (If working with others, include their names.)

An example field notebook title and collection entry:

2017 Dendrology Field Notes
Trees of the Black Hills State University Campus (BHSU)
Spearfish, South Dakota (Lawrence County)

Ramsey 1
Tree tag 4400, might be Redbud
September 16, 2017

Leaves are heart-shaped and rather shiny; don’t seem as large as Catalpa. Tree is small (maybe 12 foot tall?). We couldn’t find fruits on the tree, but found pod-shaped fruit underneath– we think those fruits were from tree #2725 but are not sure (we didn’t collect the fruits but did take a photo).

GPS is 44° 29.927’N, 103° 52.506’W This tree is located on the western edge of the BHSU Arboretum/disc golf course.

There are lots of Green Ash and Boxelder in this area. I think it is irrigated (the grass is bright green), but the trees don’t seem particularly tended.

Collectors = Tara Ramsey & Justin Ramsey