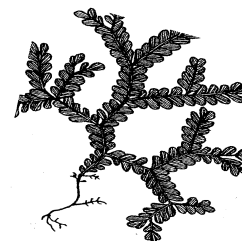


TRACY HERBARIUM BRYOPHYTE PROJECT

Texas Master Naturalists – Gideon Lincecum Chapter



A quality specimen consists of ample material with thorough location data. Without this combination, neither component may be useful from a scientific perspective. With proper attention to collecting and documentation, identification and processing of specimens results in valuable assets to science for decades to come.

Since mosses, liverworts, and hornworts (collectively bryophytes) are generally dependent on free water for sexual reproduction, look for them in areas with fairly reliable sources of surface water, soil moisture, or humidity. Some bryophytes do grow in arid environments. Search for specimens in habitats such as forests, stream banks, road cuts, in or adjacent to water bodies, waterfalls, overhanging cliffs, etc. In any habitat, bryophytes grow on a number of different substrates; in some instances, certain taxa may be obligate to a given substrate. Typical substrates include soil, rock, tree trunks, tree bases and branches, and woody vines. Many manmade structures provide a suitable habitat such as masonry buildings, cemetery headstones, roof surfaces, and other similar structures.

TMN GLC Recording Training and Service in VMS

Record training at chapter meeting, additional training sessions including education-based field trips to **AT: Citizen Science Project Training**. No travel included with AT.

For project activities including scouting or collecting specimens, documenting in form or spreadsheet, stapling and preparing for delivery, and delivering them, record volunteer service (plus travel) to: **Citizen Science (other)** AND in the description include a reference to “Tracy Herbarium Bryophyte project” along with a brief description of your activity.

EQUIPMENT

A few basic “tools” facilitate the process and produce scientifically valuable specimens. Use a sturdy multi-section shoulder bag, hunting vest, or organizer tote to keep tools and specimens organized and accessible.

small paper bags (3” x 5”)	pencil/pen	plastic grocery bags
small pocket knife	10X loupe or hand lens	drinking water
wood chisel	smart phone or GPS	snacks
sharpie marker	small spray water bottle	ice chest for long, hot days

Collecting in small paper bags minimizes space and keeps specimens separated. Avoid plastic “baggies” that may cause mold or allow specimens to continue growing. This may lead to aberrant growth and make identification difficult or impractical.

Tip: To reduce loss of equipment out in the field, attach small items to something larger (think gas station restroom key attached to a stick). Attach a smart tag (luggage tag) to expensive items like GPS or loupe so if they get dropped you have a chance of finding them.

SPECIMENS

A few square inches is an adequate **quantity** of material to aid in identification. Note: often a single collection will result in multiple taxa - due to the intricate way in which these organisms tend to grow. Bryophytes growing on hard surfaces such as rocks may yield a smaller amount of material and may be more difficult to extract. When collecting, always bear in mind that removal of specimens SHOULD NOT be conducted to the point of complete removal of a species from a site or cause significant damage to the population. If there appears to be a small population at a site, collect a smaller sample to preserve the species at the site.



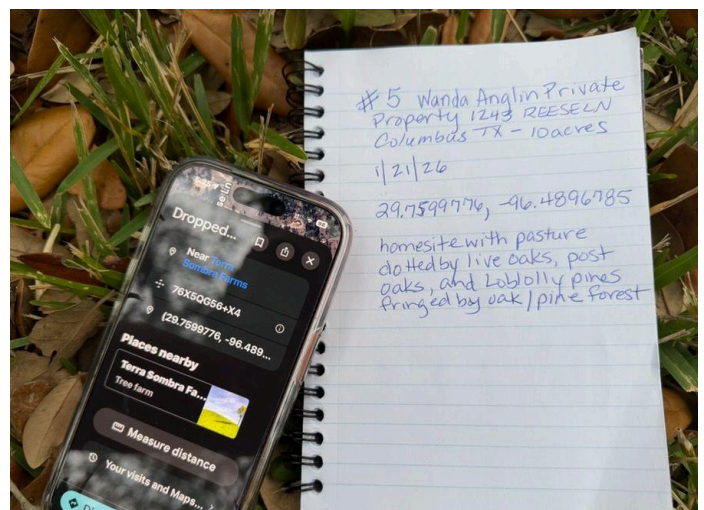
A good **quality** specimen ideally consists of both gametophyte and sporophyte generations. Most often the gametophyte generation (the green “leafy” part) is present and easily identifiable, but often will NOT include the sporophyte generation (often yellow, red, or brownish “stalk”) or splash cups (cup-shaped cluster of leaves, often vivid red to orange or yellowish-red).



COLLECTING

Set and Describe a Waypoint

The goal of a “waypoint” is to avoid capturing a geo coordinate for every specimen, yet enable someone to return to the site and find the sampling site, if needed.



Determine how you want to partition a property into generalized habitats (creeks, woodland, open prairie, rock outcrop, etc.) and assign each of these a “waypoint” in the field. Do whatever seems to be the most applicable to the property keeping in mind the goal of being able to direct someone in the general vicinity of the location from which the specimen was taken. As long as you are in the same “habitat type” you can continue to use the same waypoint unless you move, within the same habitat over about 100 yards (a US football field) where you should consider assigning and describing a new point. If you leave the habitat type, assign and describe another waypoint.

A waypoint is a described area within which a “batch” of specimens are found. Upon arrival at the collecting site, take GPS coordinates with your smart phone or GPS unit in decimal degrees (e.g., 38.18674, -84.87530). (Don’t know how? Google “how to take GPS coordinates with my iphone/Android”.) Note in your notebook (or your first paper collection bag) your next sequential number for Waypoints and its coordinates, the date, and a description. Ensure it is descriptive enough for someone to find it on Google Maps (e.g., Indian Creek Nature Area riparian area). Include approximate acres or miles and directions from a permanent, static feature (e.g., “4 miles N of intersection of Hwy 1 and 2”). Record habitat details such as vegetation type, slope, soil type, and light conditions.

Once you document the waypoint information in your notebook or on your first specimen bag, you need to put only the Waypoint # on each bag as you collect. Keep a notebook handy for recording data that may be forgotten as the day progresses.

Before moving to the next waypoint, place all your samples from the site you just completed in a plastic bag to **temporarily** keep them together for taking home to document and assign a unique ID.

Collect a Specimen

A bryophyte is usually a shade of green... helps eliminate lichens...but some are yellow or reddish-brown. Depending on substrate, most “mosses” are easily removed by hand or with a pocket knife or chisel. Place sample in an individual bag for transport to where you will dry them and record data in the spreadsheet/form. Use a marker to write on each bag:

- **Waypoint #** – # assigned above
- **Habitat** – Examples: upland, drainage



ravine, creekbed, open meadow, forest edge, or stream.

- **Substrate** – important as some taxa occur on specific or limited substrates.
 - tree/shrub species, part, and status (quercus branch decayed, yaupon trunk live)
 - rock (limestone, granite, sandstone)
 - soil (sand, silt, clay, etc.)
 - aquatic (if submerged or at water line)
- **Identification** - if you know what it is because an experienced botanist/collector is present and provides a preliminary
- **Sporophyte Y/N** - if sporophytes or splash cups are present
- **Notes** – anything not be observable when the specimen dries
- Leave space at the bottom to record your Unique ID later when you document the specimen in your spreadsheet/form.

Place the specimen in a labeled paper bag; fold a couple of times then put in your “tool bag”.

Each time a waypoint is fully collected, put all specimen bags in a plastic bag for transport together to where they will be dried. Put the plastic bag in your tool bag and continue to the next waypoint. Do NOT leave specimens in a hot vehicle. If you will be collecting for several hours at different distant locations, take an ice chest with a frozen reusable gel “ice” pack to keep the specimens cool without wetting them artificially.

DRYING SPECIMENS

VERY IMPORTANT: DO NOT LEAVE SPECIMENS IN THE PLASTIC BAG! REMOVE THEM AND OPEN TOPS AS SOON AS YOU CAN. When back at home, open and set out the specimens by Waypoint # groups to dry for a few days or more to air dry to ensure quality specimens. Set out where they will remain undisturbed such as on a table or unused counter in an environmentally controlled area. A small fan on low speed will facilitate drying. Avoid direct or indirect heat for drying. Added heat will dry the specimens too rapidly and result in a poor quality specimen.



DOCUMENT Specimens and ASSIGN Unique IDS

While your specimens are drying, you can document them in your bryophyte database

spreadsheet/form which helps you assign a unique ID. To record your specimen data, you may use the bryophyte database spreadsheet/form in **Microsoft Excel or Google Sheets** or a printed version of the spreadsheet as a **paper form**.

In your spreadsheet/form, record Waypoint information from your notebook and fill-down (or for paper form users, use ditto marks or a vertical line to indicate the information remains the same for following rows). Then document each specimen assigning a unique ID to each specimen and **(IMPORTANT)** writing that unique ID from the row of data on the specimen bag.

The unique ID consists of your first initial, last name, and a sequential number that never gets reused, example: W ANGLIN 1, W ANGLIN 2, W ANGLIN 3...W ANGLIN 1029. Do NOT duplicate numbers EVER. The last point is important. If you turn in a spreadsheet file or paper form to a TMN GLC bryophyte collecting project lead, be sure to start your next spreadsheet/form using the next sequential number for your first Unique ID in that spreadsheet/form.

This unique ID enables a specific sample to correctly link to its data. This is important in case the location needs to be re- visited for some reason.

For Spreadsheet Users

Download this file, TMN GLC Bryophyte Database Documentation Form (this file is NOT for paper forms):

<https://docs.google.com/spreadsheets/d/1oss01QrhOPKxRmUEWKyDSfk-vlAv4j3t/export?format=xlsx> (if you have Google Drive trouble, request a copy of the Excel spreadsheet form from a project leader.) Use the drop-downs of the spreadsheet and copying/pasting and filling down to keep data consistent.

When you have completed collecting and wish to submit your specimens and data to the project leader, ensure all specimen bags have been documented in the spreadsheet and a Unique ID matching the specimen's row and bag written on the bag, then prepare your spreadsheet file for sending to the project leader. Save the file using "save as" to make a copy naming it with a prefix of your first initial and last name and date. Example with the prefix part **highlighted**:

- **w-anglin-31-january-2026**-tmn-glc-bryophyte-collection-spreadsheet.xlsx

Email saved spreadsheets to wanda.anglin@hotmail.com. If you don't get a reply from Wanda within a day, check to see if it was received, 713 628 6545.

For Paper Form Users

Paper forms require legal size (8.5" x 14") printer paper or if you print on 8.5" x 11" paper, you will have to tape the 2 pieces together. Download this PDF file to print the Paper Form for

TMN GLC Bryophyte Database Documentation (this file is NOT for Excel data entry use):

<https://drive.google.com/file/d/1WCpMGmBZLsBJ7JSx2WKhwIz9N3ab9OMI/view?usp=sharing>

Please write your name and phone number at the top right of each page. Write legibly when recording your specimen data. You may use multiple rows for one specimen if needed to write out your details, but be sure to only assign one Unique ID to each specimen.

Scan or take a photo of each paper form page and email to sheriawilcox@gmail.com.

CONSOLIDATING SPECIMENS

Your collection is ready to send to the project leader when:

- Specimens are completely dry
- Each bag has been documented in the spreadsheet/form and assigned a Unique ID
- The Unique ID written on each bag
- Each bag is folded 2-3 times and stapled in the middle of the fold
- You have submitted your data via spreadsheet or paper form.

Put all specimens in a large bag(s), paper box(es), or plastic tub without the lid (DO NOT ENCLOSE IN PLASTIC). Write your name on the box or affix a piece of masking tape to write on. **Bring them to the chapter meeting on the project consolidation date, March 21, 2026, or arrange with Sheri Wilcox to get them to her before the meeting.**

The project leaders will consolidate all data from spreadsheets/forms and specimens from all members into one submission to go for delivery to the S. M. Tracy Herbarium (TAES).

Following submission of this collection period's data and specimens, our TMN GLC Bryophyte Collecting project will be on hold until we receive feedback from the herbarium on future collecting needs. Project volunteers will be notified of future collecting periods.

RESOURCES

- Moss, Liverwort, & Hornwort Images: <https://www.texasbryology.com/image-gallery>
- Bryophyte Glossary: <https://www.texasbryology.com/s/Basic-Bryophyte-Terminology.pdf>
- Bryophytes of Texas group: <https://www.facebook.com/groups/BryophytesOfTexas/>