

Herbarium specimens are carefully documented, well-preserved plant specimens. They consist of well-laid out, dried plant material that is attached, together with a label, to a sheet of paper. The label states **where** the plant was collected, what kind of **habitat** it grew in, **who** collected it, and the **date** of collection, collection number associated with the field notebook. Both the specimen and the label determine the quality of a herbarium specimen.

Some material requires special preservation. Cones are placed, with their label, in plastic bags. Bryophytes are dried and stored in paper packets. Fungi are stored, after being completely dried, in plastic bags and boxes. Fleshy fruits may be stored, with their label, in alcohol or other preservatives. But for most plants, and most purposes, the combination of pressing, drying, and gluing to archival paper is adequate. Specimens that were made 500 years ago are still being used.

Bryophytes and Lichens:

Bryophytes are dried and placed in paper envelopes. The label is glued or printed on the front of the envelope.

The Importance of Herbarium Specimens:

Documenting Research.

Voucher specimens are herbarium specimens that document a study. They enable others to determine later what kind of plants you were calling by a particular name.

Voucher specimens also give your study substance, repeatability, and longevity. If the taxonomic treatment (classification) of any of the species you have worked with is changed, subsequent researchers can go to your voucher specimens and determine what your plants are called under the new system. If there are no voucher specimens, your paper has lost some, possibly all, of its value. Sometimes your identification is questioned and a voucher specimen is a record of your identification.

ALL herbarium specimens are a long-term source of verifiable data. Once deposited in an accessible herbarium, specimens can be part of many research studies, including studies that may not have been dreamed of when they were first collected

Herbarium specimens are important in documenting species diversity. Herbarium specimens are a permanent record of which species grow, or once grew, at a particular location, in a particular habitat, at a given time. Taxonomists, ecologists, and landscape architects rely on herbarium specimens to determine which species have been found in a particular area. Floras may provide a brief description of the habitats in which a species grows; to find out whether it has been found at a specific location, it is usually necessary to go and check the specimens themselves.

Creating Good Herbarium Specimens

1. Collect equipment: Field notebook, plant press, newspaper, pencils, digger, knife, plastic bags, hand lens, map, Altimeter, GPS, (or smart phone with those features), backpack, and water.
2. At site: Make field notes for the area as a whole. Record date (with year), who is with you, where you are (state, county, verbal description, latitude and longitude (or UTM coordinates), elevation. Describe habitat: slope, direction of slope, soil, cover, associated species (scientific names preferred), moisture regime).

3. Select plant; make sure that, for every plant you collect, there are at least 20 more in the immediate vicinity. For woody plants, this is not a great concern because collecting an adequate sample does not kill the plant.
4. In field notebook: give plant a collection number, leave line for its name, Add notes about the distribution of this particular species in the area - ecology, abundance. Add notes on flower color, plant height, tree or shrub (if woody). Note features especially that are lost when pressed (odor, color)
5. Obtain plant material. Woody plants - flowers and leaves; make sure your field notes indicate whether shrub or tree and height. Herbaceous plants - flowers, leaves, and enough of base to indicate whether it is woody at base and whether it is rhizomatous or not. Collect enough material that you can put extra flowers in pockets and if you need, save some for keying and still make a good herbarium specimen.
6. Write collection number on newspaper. It is best to press plants immediately, but a plant press is a bulky, awkward object. Place other samples in appropriate container; write number on outside of container. Back to the plant press: Lay each plant out, tag, inside a folded sheet of newspaper (or other thin paper). Make sure that neither the paper nor the plant material extend beyond the edges of the press. Put plant press in/on dryer (in dry climates the top of a car works well, in wet climates near heater/stove if a plant dryer is not available). Put bags with identification samples in refrigerator. Key them out soon.

Below are examples of plant specimen labels:

Poa kelloggii Vasey

Poaceae

Abundant rhizomatous perennial, with *Carex deweyana* ssp. *leptopoda*, *Ranunculus uncinatus*, *Ribes bracteosum*. In moist shady area under *Abies grandis* and *Psuedotsuga menziesii*. South of Big River on old road just east of Stanford Inn; Big River State Park. UTM 10 432187E 4350269N (WGS84/NAD83). USGS **MENDOCINO** Quad. Just southeast of the village of Mendocino, Mendocino Co., CA.

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