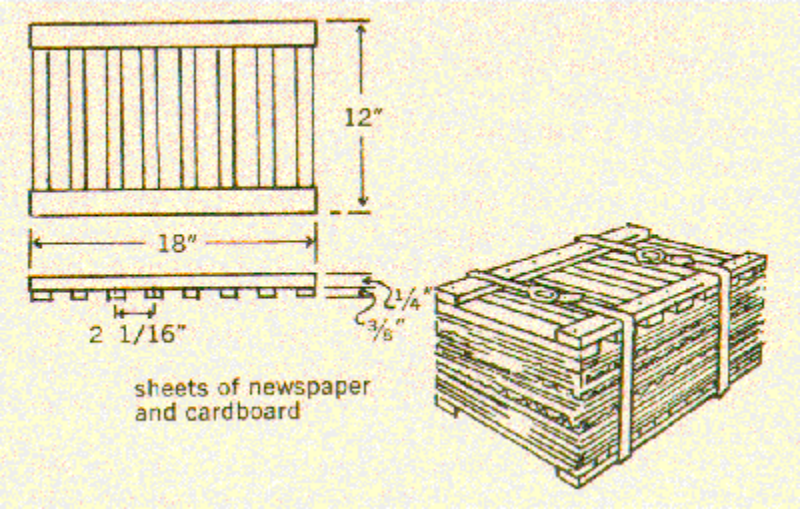
COLLECTING PLANT SPECIMENS FOR NEW MEXICO HERBARIA

Thank you for volunteering to collect plant specimens for New Mexico's university herbaria. Your specimens can remain useful for centuries and will add to a growing body of scientific data on plant diversity, variation, distribution and ecology.

Plant Press

Plants should be pressed immediately after collection. You can do this in a drying press, or temporarily in a field press and later transferring them to a drying press.

A basic plant press consists of two 12" by 18" endboards of plywood or masonite, plus two adjustable straps or ropes. If you are handy in the wood shop, a more traditional press can be made with hardwood strips and rivets (see illustration below).



Plant presses may be purchased from Herbarium Supply:
http://www.herbariumsupply.com.

The endboards are placed on the outside of a stack of cardboard ventilators, and the straps are tied around the outside. The straps need to be long enough to surround the expanding stack (as plants are added) and strong enough to allow you to tighten the press down very hard. Ideally, there are two pieces of blotter paper between the cardboards, but one (or even no) blotter will do.

A temporary field press can be made of two thin pieces of masonite (or heavy cardboard) as endboards for a few cardboard ventilators and much newspaper held together by straps, rope, or bungee cords. This light-weight press can be carried into the field to press specimens that will be later transferred to a heavy drying press.

Pressing and drying procedures

1. Collect enough plant material to fill a herbarium sheet. Almost all specimens must have flowers, fruits, or both to be accurately identified. Only a few tree and shrub species with obvious leaf characteristics can be vouchered without flowers or fruits.

2. Unwanted parts, dead leaves, extra leaves, etc., should be trimmed off before pressing. All parts should be free of dirt before they are put into the press.

3. Place a single piece of newspaper between the blotters and write the specimen collection number on the margin. (11" x 14" weekly newspapers are best)

4. Plant parts should be arranged in the newspaper so there is as little overlap as possible; stems should be bent sharply and neatly to fit in the paper. Plants should not be layered or massed together within the pressing papers.

5. Close the press and pull the straps very tight. Kneeling on the press while the straps are being tightened helps to compress and flatten the specimens within.

6. Most specimens will dry within a week or two. Some woody or more succulent plants may require a month of drying in the press. If blotters are not used, or the plant material is thick with moist tissue, drying can be hastened by removing specimens from the press (while in their papers) every two days and letting them (and the open press) dry in a warm place for two or more hours before placing them back in the press. Failure to do this may cause the specimen to become blackened and moldy.

7. If a plant press becomes moist from rain or frequent use, it must be disassembled and completely dried before being used again to press plants.

8. The dried specimens are brittle, fragile, and loose within their drying papers. They can be transported to the herbarium in a rigid cardboard box, or by bundling several at a time between two cardboard pieces tied with string.

Label Data

Even the most beautifully preserved plant specimen is useless without complete and accurate label data. At a minimum, collection data must include:

- Collection location – state, county, both a narrative description and a point location (Lat-Long or UTM), and elevation.
- Habitat – substrate and plant community.
- Collection date.
- Collector name(s)
- Collection number
- Plant characteristics not obvious from dried specimen.

Sample specimen labels

FLORA OF NEW MEXICO

BETULACEAE

Ostrya knowltonii Coville

Otero County, Lincoln National Forest, Sacramento Mountains,
Alamo Canyon just above confluence with Purgatory Canyon; NAD 83, E419134 N3634760; 1740 m.
Limestone canyon bottom with *Fraxinus velutina, Vitis arizonica*.
Several dozen small trees along ¼ mile of canyon.
Date: 25 Jul 2006

Collector: R.C. Sivinski and P. Tonne
Collection No. 6083

FLORA OF NEW MEXICO

SOLANACEAE

Solanum jamesii Torrey

Torrance County, ca 7 air miles W of Corona, Cibola National Forest, Gallinas Mountains, north foothill of Cougar Mountain; N34º15'59.5" W105º43'21.0" (WGS 84); 6920 ft.
Rocky igneous soil in piñon-juniper woodland.
Corolla white.
Date: 10 Sep 2006

Collector: R. Sivinski, T. Lowrey and J. Stewart
Collection No. 6212

LOCATION – Collection locality information should be enough to place a point on a map, or for a future botanist to return to the same location. Always include the state, county, and a narrative description that is detailed enough to get there with a map. If your are collecting in a mountain range, drainage, National Forest, State Park, etc., include the names of these places in the narrative so that future database searches can reveal their floras.

Narrative Location

Poor	About 9 miles north of Roswell
Better	Hwy 285, 8.7 miles north of intersection with Hwy 70 at Roswell
Best	Salt Creek arroyo on west side of Hwy 285, 8.7 miles north of intersection with Hwy 70 at Roswell

Point locality coordinates allow your collections to be accurately mapped in a floristic atlas and will also help future researchers return to the places of your collections. A point location is either Latitude-Longitude or UTM coordinates. Either one can be obtained in the field with a hand-held GPS unit. If you don't have a GPS, mark the point of your collection on a map. When you return home, go to TopoZone on the Internet at http://www.topozone.com and find your collection point on a TopoZone map. TopoZone will give you the Lat-Long or UTM coordinates of your point. Whether you use a GPS unit or TopoZone, be sure to write down the map datum you used. The NAD83/WGS84 map datum is preferable to NAD27 map datum, but either way – write it down! (*Note: You do NOT need a GPS reading or coordinates for every plant you collect – just for each new collecting location.)*

Elevation not only helps locate the collection point, but also provides important data on the ecological amplitude of the plant species you collect. Elevation can be recorded in either feet or meters and is obtained from your GPS unit or a topographic map.

The maps you take to the field should be detailed enough to accurately describe your collection locations. USGS 7.5 Minute Quadrangle maps are very detailed and easy to use, but have the limitation of not covering a large enough area. The most convenient field maps are the BLM edition 1:100,000-scale, 30 x 60 Minute Quadrangle showing topographic contours and surface ownership. The surface ownership feature is very helpful in avoiding lands where trespass is not allowed without permission. These maps fold-up like a road map and sell for about $8.00 each. The entire state is covered by 64 of these maps, but you need only purchase the ones where you will be collecting plants. The least expensive alternative is to purchase a New Mexico Road Atlas, which covers the whole state, also has the land ownership feature, but is not topographically contoured and names fewer geographic features.

HABITAT – Habitat descriptions provide important ecological data for the species. Try to identify the physical substrate and plant community. This can be simple like "rock outcrop in conifer forest" or more complete such as "coarse, sandy soil in cracks of granitic outcrop with *Pinus ponderosa, Pseudotsuga menziesii* and *Quercus gambelii*". Naturally, the more complete description is better, but only include the information you are certain of. If you can't tell granite from rhyolite or *Pinus ponderosa* from *Pinus flexilis*, then use the simple description and don't risk conveying inaccurate information.

Substrate is often significant in determining the plant community. If there is a lot of exposed parent rock try to determine if it is igneous (granite, volcanic, etc.) or sedimentary (limestone, sandstone, shale, gypsum). Soil information is also useful, so describe it if obviously sandy, clayey, silty, or alkaline. Other details about the landscape can also be recorded, such as N-facing slope, swale, cliff face, arroyo bottom, etc. Host plants of parasitic plants should be noted and even included with the specimen (if possible).

Try to convey an image of the plant community with common descriptive terms, such as arid grassland, desert scrub, mountain meadow, conifer forest, riparian woodland, etc.

If you can, include the Latin names of a few dominant species in the tree, shrub and herbaceous cover.

DESCRIPTION OF PLANT – Describe features of the plant that will, or may, not be evident when the specimen is dried and mounted. Flower color often changes when dried, so make a note of the fresh flower color when collected. Specimens from trees, shrubs, and large herbaceous species do not include the whole plant, so note the height and growth form. An indication of abundance (locally common, occasional, rare, or number of plants seen) can also be useful to future researchers.

COLLECTOR AND COLLECTION NUMBER – The person who records the specimen in a field journal and assigns it a collection number must be the collector name on the specimen label. The names of field associates who are present when the collection is made can also be included on the label as collectors, but this is optional. If multiple names are included as collectors, the first name must be the person who assigned the collection number and made the journal entry.

The collection number is unique to a specific collector and collection, and cannot be used more than once. This number refers the specimen to a single entry in the collector's field journal. Duplicate specimens can be collected under the same number, if they are collected by same person at the same location on the same day, but would get different numbers if anything differs on the specimen labels. For instance, I can send three specimens of *Physaria newberryi* to three different herbaria and number them all *2647* because I collected them at the same place at the same time. If they were only flowering specimens and I went back a month later to collect the same species in fruit, the later collection would get a different collection number. If I went to a different location and collected the same species on the same day, it too would get a different collection number.

What to Collect and What Not to Collect

New Mexico university herbarium collections document the regional flora. The flora consists of all native and naturalized plant species. All naturally occurring native plant species should be collected and vouchered as labeled herbarium specimens. DO collect non-native plants, but only those that are self-sustaining and feral. DO NOT collect native or non-native plants that have been purposely planted and maintained in landscaping, agricultural fields, or reclamation areas.

DO NOT collect plants that are federally listed as threatened or endangered. These plants are protected by the Endangered Species Act and can only collected under permit from the U.S. Fish & Wildlife Service. Plant taxa that are listed as endangered by the State of New Mexico (but not by the Feds) should be collected to voucher their population distributions and abundance. Permits to make herbarium specimens of state endangered plants may be obtained from the NM Forestry Division (call Bob Sivinski, 476-3347). Several other rare plants are listed as 'sensitive' by various federal agencies and may, or may not, be collected within some federal jurisdictions. Agency

status of sensitive, threatened and endangered plants can be found on the NM Rare Plants web site at http://nmrareplants.unm.edu.

Where to Collect and Where Not to Collect

Collecting a specimen that duplicates an existing herbarium specimen from the same, or approximately the same, location is usually not useful. There are several areas in the state where few, if any, plants have been collected. These areas should be the focus of future general collection efforts (collecting everything). Area assignments for general collection can be obtained from Bob Sivinski at robert.sivinski@state.nm.us. Relatively well-collected areas (National Forests, counties with universities, areas with floristic treatments) still have plants that need to vouchered, but general collection would likely result in too many duplications. Consult the INRAM database at http://biodiversity.inram.org with an advanced search to generate a list of existing herbarium specimens from the area you plan to collect in. If a plant species has already been collected within 20 miles of your collection area, don't collect it again.

Bureau of Land Management (BLM) land is the only jurisdiction in New Mexico where a field botanist can freely travel and collect herbarium specimens (except T&E plants). All other lands in NM require permission or collection permits from the landowners or management agencies. National Parks and Monuments and military reservations are especially difficult places to gain permission to collect. National Forest permits are not difficult to obtain, but most National Forests in NM are relatively well collected and are not a priority. UNM Herbarium can help obtain collection permits from State Parks, State Wildlife Areas, and State Trust Lands. Permission to access and collect on private and tribal lands must be obtained by the collector.