



# Conserve O Gram

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## Labeling Natural History Specimens

### *Introduction*

Most natural history specimens that your park acquires will already have been accessioned, cataloged, and labeled. (NPS collecting permits require researchers to accession, catalog, and label retained specimens that they have collected.) However, you will probably discover unlabeled specimens in your collection.

Scientists and curators label specimens in various ways. It depends on the type of specimen and how it's preserved. Whichever method you use, be sure to always:

- use stable materials
- and use them appropriately

The following guidelines should help you determine the most appropriate method.

### *Paper Labels*

The most popular type of natural history labels are paper. Paper labels are extremely versatile. You can use paper labels for herbarium, insect, bird, mammal, and fluid-preserved specimens. ANCS+ will print natural history labels.

Paper products can vary in quality and appropriateness for the preservation of biological specimens. Paper labels that you use should:

- be white

- have a neutral to slightly alkaline pH (pH 6.0-8.0);
- have a lignin content of less than 0.3%
- be of long-fibered cotton stock, although alpha-cellulose, ground-wood papers are also acceptable

**Note:** Do not use alkaline-buffered (“buffered”) paper, which has a pH of 8.5 or higher, for labels in direct contact with specimens. Only use buffered paper labels when applied to herbarium sheets or packets, insect pins, microscope slides, or the exterior of boxes or other containers that aren't in direct contact with specimens.

### **Inks for Paper Labels**

Inks should be resistant to light, fluids, and abrasion.

Only use carbon-based, permanent, black ink to label specimens.

- Carbon inks do not fade over time.
- Commercial, black printing inks are usually carbon-based.
- Most laser and photocopier toners are usually carbon-based.
  - Laser and photocopiers also apply the

toner with a certain amount of heat, which helps fuse the toner particles to the paper.

- Some inkjet printers now use pigment-based inks. These inks are not acceptable for labeling biological specimens.
- Only black, carbon-based pigments are acceptable for labeling biological specimens.

### Ink Quality

Liquid inks vary greatly in quality. Black inks suitable for labeling in biological collections include:

- **Drafting inks designed for writing on drafting film.** Use technical pens, such as a Rapidograph® to apply these inks. Drafting inks tend to be carbon-based inks with a neutral pH. They adhere well to almost any surface. **Note:** You don't have to use drafting inks in technical pens or on drafting film during specimen labeling.
- **Inks in Certain Fiber-Tipped Pens.** Black liquid inks in some fiber-tipped pens are acceptable for use in labeling specimens. Be sure to choose pens with carbon-based inks.

For any ink, test how long it takes for the ink to dry so that it will not smear, how well it the dry ink resists abrasion, and how well it resists water, alcohol, or other fluids that may be used in specimen preservation.

### Plastic Labels

**DO NOT USE PLASTIC LABELS.** Most of the plastic labels that have been used with

specimens in the past are not stable. The only exception to this general rule is Tyvek®, a non-woven polyester. Tyvek® has been successfully used for specimen labels.

### Metal Labels

Metal labels are sometimes part of a specimen in the form of leg bands or ear tags. Always retain these with the specimen. Do not use metal for other labels or label attachments. Metal labels/attachments can:

- corrode in contact with the specimens
- possess sharp edges and corners that can cause physical damage to the specimen

### *Attachments for Labels*

#### Attaching Tags

Attach tags to specimens with cotton thread of a thickness appropriate to the size of the specimen. Ensure that the attachment is:

- long enough to permit the tag to be read on both sides without stress on the specimen
- short enough that it does not become entangled with the specimen or adjacent specimens

Do not use plastic and metal ties when labeling specimens. Such ties can deteriorate from contact with the specimens and may cause mechanical and/or chemical damage to them.

#### Attaching Herbarium Sheet Labels

Use methylcellulose paste to attach labels and specimen packets to herbarium sheets. This adhesive is compatible with the sheets, packets,

and labels. Follow these steps:

- Mix a very pure, high-viscosity methylcellulose powder (such as Methocel A4M<sup>®</sup>, a grade A, 4,000 viscosity methylcellulose made by Dow Chemical) with distilled or deionized water to form a thick gel. (Follow the directions given by the manufacturer.)
- Then dilute the mixture with ethanol or an ethanol and water solution to make a fast-drying adhesive for paper materials.

Methylcellulose may not work well to attach paper labels to all surfaces. To adhere a label to a glass vial, you may need to use an acrylic adhesive. Another option is to use a self-adhesive, foil-backed, paper label with an acrylic adhesive. These labels are available from various conservation suppliers.

### *Labeling Directly on Specimens*

You can directly label bone, shell, and other fairly smooth-surfaced specimens. Be sure to use a stable acrylic resin (e.g., Acryloid B-72<sup>®</sup>) to seal the surface below the number. If you don't seal the surface, inks can penetrate many surfaces, causing permanent alteration or requiring aggressive scraping to remove labeling errors. See *COG 1/4* for more information.

### *Labels for Wet Specimens*

#### **Paper for Labels**

For wet specimen labels use high quality, long-fibered, cotton rag paper. It holds up very well in fluid collections. The only synthetic polymer that seems to withstand the fluid environment is a non-woven polyester, such as Tyvek<sup>®</sup>.

Do not use:

- Paper treated with formaldehyde or other chemicals to make it fluid-resistant. These papers can cause slight acidification of storage fluids and/or introduce contaminants. This can damage the specimen's utility.
- Metal labels can corrode and may also cause mechanical damage to specimens (however, keep in mind that leg bands and ear tags should remain with specimens, even when stored in fluids).

#### **Inks and Other Media**

Use only carbon-based, black inks on specimen labels, including barcode labels. Carbon inks do not fade over time. Commercial, black printing inks are usually carbon-based, as are most laser and photocopier toners. Laser and photocopiers also apply the toner with a certain amount of heat, which helps fuse the toner particles to the paper.

##### 1. Liquid Inks

Liquid inks vary in quality. For labeling wet collections, use black drafting inks. (Drafting inks are designed for writing on drafting film, using technical pens.) These inks tend to be carbon-based inks with a neutral pH that adhere well to almost any surface. They do not dissolve in water, alcohol, or formalin solutions. (These inks do not have to be used in technical pens or on drafting film for specimen labeling.)

##### 2. Fiber-Tipped Pens

Black liquid inks in some fiber-tipped pens are acceptable for use in labeling wet specimens. Be sure to choose pens with carbon-based inks, and test:

- how long it takes for the ink to dry so that it will not smear
- how well the ink resists water, alcohol, and formalin
- how well it resists smearing or loss from abrasion when wet with any of these fluids

### 3. Attachments for Labels

Cotton thread or string will work well to attach labels to fluid-preserved specimens.

Do not use:

- wire or any other metal fasteners
- plastics

### Sources

Methylcellulose paste adhesive:

- Herbarium Supply Company  
3483 Edison Way  
Menlo Park, CA 94025  
(650) 366-8868  
[www.herbariumsupply.com](http://www.herbariumsupply.com)
- Conservation Resources International, LLC  
5532 Port Royal Road  
Springfield, VA 22151  
(800) 634-6932  
[www.conservationresources.com](http://www.conservationresources.com)

Paper, 100% Cotton Bond (for labels):

- Hollinger Corporation  
PO Box 8360  
Fredericksburg, VA 22404  
(800) 634-0491  
[www.hollingercorp.com](http://www.hollingercorp.com)

- Local stationary stores

Inks: Higgins® Black Magic® Waterproof Ink  
or Pelikan #17 Drawing Ink:

- GSA contractors at: [www.gsaadvantage.gov](http://www.gsaadvantage.gov)
- Local art and stationary stores
- Penco Graphic Supply Inc  
718 Washington Ave North  
Minneapolis, MN 55401  
(612) 333-3330  
[www.artsuppliesonline.com](http://www.artsuppliesonline.com)

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