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Standard Operating Procedure 13: Reference Herbarium Collection

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Standard Operating Procedure 13: Reference Herbarium Collection

A reference herbarium collection is maintained to assist in the identification of species associated with wetlands monitoring at Cuyahoga Valley National Park (CUVA).

Taxonomic Authority

Field identifications need to be validated and standardized using the nomenclature of the United States Department of Agriculture PLANTS database (<http://plants.usda.gov>), a federal agency standard that is regularly updated and easily accessible. The United States Department of Agriculture PLANTS database uses the Integrated Taxonomic Information System (ITIS, <http://itis.usda.gov>).

Preserving Vouchers

Materials

1. Wooden voucher press with two adjustable straps
2. Cardboard ventilators
3. Newspaper sections trimmed to length of herbarium paper (~11 1/2" x 16 1/2")
4. Sharpie
5. Collected vouchers

Procedure

1. Transcribe information from the temporary voucher label to the newspaper section that the specimen will be placed in. Use newspaper sections that open like a book.
2. If no voucher label is available, use the sharpie to write the location ID and date on the newspaper.
3. Spread the specimen over the entire length and width of the newspaper section within the press dimensions. Take special care to unfold all leaves and flowers. Larger plants may be pressed in multiple segments.
4. Fold the open end of the newspaper over the specimen and place a cardboard ventilator on top of the newspaper specimen. Vouchers can be stacked in bunches of 5 or 6 between each cardboard ventilator if the samples are relatively thin.
5. Once all vouchers have been placed in the press, place the wooden top and bottom over the cardboard and tighten the adjustable straps to maintain pressure on the specimens.
6. Place full plant presses sideways on the plant press dryer (Figure 13.1) to allow heat to move through the cardboard sections.
7. Slide wooden leaves securely next to the press to allow the heat to escape only through the press and plug it in.
8. Dry the press for 2-3 days before removing from the dryer.
9. Turn off the dryer at night and when there is no one in the office.



Figure 13.1. The plant press dryer is used to quickly dry out plant specimens held in a wooden press.

Mounting Vouchers

At CUVA, several trained volunteers are familiar with the procedures of mounting, labeling, and filing vouchers in the park herbarium (cover). Trained volunteers are able to keep the vouchers processed as quickly as possible.

Mounting Materials

1. Herbarium mounting paper
2. Herbarium glue
3. Glue applicator
4. Paper towels
5. Metal weights
6. Glue brushes
7. Wax paper
8. Paper clips
9. Paper weights
10. Staple remover
11. Pressed vouchers

Mounting Procedure

1. Prepare glue by mixing no more than 1 part water to 3 parts glue.

2. Inspect pressed plant to determine what identifying characteristics should be preserved and how plant should be arranged, considering:
 - a. Flowers and inflorescences
 - b. Several leaf samples per side
 - c. Ligules at the base of leaves
 - d. Rhizomes and other root structures
3. Select full or half sheet of acid-free paper based on size and arrangement of preserved parts.
4. Affix label to lower-right corner (use small labels for half-sheets).
5. If the plant has not yet been identified, note all pertinent information (date, location collected, etc.) and attach the note to the upper-left corner with a paperclip.
6. Glue may be brushed directly on to the plant. In some cases, it is effective to apply glue in a thin bead directly from the bottle—however this should be confined to more robust structures. Excess glue may discolor flower petals or thin leaves and should be used sparingly on delicate structures.
7. Samples are weighted to keep glue in contact with the paper during drying. Weights can be removed after glue begins to set (2 to 3 hours).
8. If the sample contains multiple flowers, a portion of the flowers should be left un-glued to allow for additional manipulation during the identification process.
9. Inflorescences on grasses should be spread out and glued to show how they attach to the stem.
10. If the sample contains loose seeds, a reasonable amount should be collected in a seed envelope and paper-clipped to the voucher. Write the scientific name and collection date on the seed envelope in case it becomes separated from the voucher.
11. Fill out the herbarium label (Figure 13.2). Keep common name and scientific name in pencil until the plant is verified by an external (non-NPS) taxonomist.
12. Assign a WetMon ID, which is a species identifier.
13. Catalog the voucher in the database and file in the herbarium cabinet.

Voucher Labels

1. Herbarium samples are stored by taxonomic family. Family is written in the white space around the standard label. The taxonomic family is the taxonomic level ending in “-aceae.” Verify the family in a trusted reference such as plants.usda.gov.
2. *Technical Name* should include genus, species, and variety if applicable, followed by the classifier name in parenthesis.
3. *Common Name* should be taken from the USDA plants database.
4. *Collected by* and *Date* should be copied from the tag included by the original collector.
5. The park code is replaced with a WetMon ID # (Figure 13.2), which is assigned in chronological order in the wetland database after it has been verified.
6. A *Category Number* is traditionally a unique, 12-character number typically assigned to each specimen record using the park acronym and assigned museum numbers. We have the external verifiers use this space to write in their initials and date post-verification.
7. Accession numbers are not used for these reference vouchers because they are designed to be taken in the field and will need to be replaced within a 3- to 5-year period.

External Verification

We verify our voucher identifications using partner staff who are local expert taxonomists or botanists. These partners currently include Cleveland and Summit Metro Parks. Voucher

verifications can be scheduled at any time after a specimen is identified. Usually 4 hours are needed to verify approximately 30-50 vouchers, depending on species.

ALISMATACEAE	National Park Service Form 10-512 (JUNE 1982)		Park Code <u>WETMOND144</u>	
	Technical Name	<u>Sagittaria latifolia Willd.</u>	Cat. No.	<u>DSS 11/25/2014</u>
	Common Name	<u>Duck-potato, wapoto</u>	Acc. No.	_____
	Locality	<u>Kreji Remediation</u>	Elevation	_____
	<u>wetlands (Plot 1)</u>			
	Habitat	<u>open marsh-restored/seeded</u>		
	Collected By	<u>Serie Bingham</u>	Date	<u>10/01/2014</u>
	HERBARIUM COLLECTION			

Figure 13.2. Herbarium label showing the location of certain label attributes required for the wetland monitoring reference herbarium collection.