

NAMA Voucher Collection Project: Procedures, 2019

Preparation.

Prior to the Foray:

The Foray organizers give each walk location a unique number (1, 2, 3); this includes workshops and pre-foray activities. If a bus foray has more than one stop, then use a different name and 3A, 3B, etc. for each location. The data for these locations (walk number, walk name, date, name of specific site, name of park or forest, habitat, nearest town, county, state or province, country, latitude, longitude, elevation) are sent to the Voucher Coordinator to make a lookup file for the voucher database. Number "0" (zero) is used for anything (not on a scheduled walk) collected during the weekend at the foray headquarters, for example the university campus or the grounds surrounding the convention center.

The Voucher Procedure (this file) and the Voucher Handout (a separate file) are sent to the Foray organizers and Chief Mycologist in advance of the Foray. The Foray organizers send the Voucher Handout to participants via e-mail in advance or make copies to put one in each foray participant packet. The Voucher Coordinator sends the Voucher Procedure to the voucher staff and supported students and hands out copies at the foray to voucher and display room volunteers and the mycologists making identifications.

Display room, ID and voucher setup:

Get as many tables as possible for display, foray, sort, ID (microscopes), voucher work, and photography. It is a rare foray when we have more tables or space than needed.

The best layout for space is to have an area or room set aside for the foray drop-off and sort tables. This area should be closest to the doors where people returning from the buses enter the building. Near this area but in a segregated (limited access) area is the voucher process (including photography); this area can be part of the mycologist ID space (if in a separate room). The display area should be well delimited from the sort area.

First day of the Foray:

Request volunteers to help with the display tables, sort, and voucher process. The Voucher Coordinator schedules volunteers and students in several shifts throughout each day. Voucher supported students work either morning or afternoon plus help in evening as necessary and Sunday morning.

Communicate with the Mycophagy Committee and foray participants that edible mushrooms and dye fungi cannot be taken from the sort tables or the display tables without approval from the Chief Mycologist or the persons in charge of the voucher process. Voucher specimens must not be removed. There is typically a designated location for participants to put edible fungi for the mycophagy session.

Steps in the “assembly line” for specimen processing and vouchers.

1. Collectors put specimens on the foray tables. One or two tables for each walk location.
2. Labeled specimens are moved to the sort tables arranged by morphological group.
3. Identified specimens go to Recorder who checks the names and marks the labels.
YELLOW for new Vouchers. These are entered in the database.
BLUE for Duplicates. These go to display tables.
ORANGE for Aliens (outside the Foray area). Vouchering is optional.
4. Voucher specimens then go to Photography.
5. Selected specimens are processed for tissue samples for later DNA analysis.
6. Photographed vouchers are put on the Display tables.
7. Later, vouchers are transferred to the Drier.
8. Dried vouchers are bagged after ensuring that they are thoroughly DRY.

Be aware of bottle-necks in the system and have enough volunteers to maintain vigilance.

Participants are given a pad of field labels (“tags”) when they get on a bus or join a foray. Fungi are collected during the Foray and collectors fill out field labels for specimens. Bus leaders should encourage collectors to fill out their labels when they collect or while on the bus. Leaders remind people what number foray it is.

1. Foray tables (drop-off), one or more for each location, by walk or foray number. For each day, have large signs to clearly mark each table with its walk number and name. Also, one or more large signs should be posted in the sort area: PLEASE DO NOT MIX SPECIMENS ON PLATES.

Each foray typically has one or more designated tables to avoid mixing specimens from different locations. Specimens are placed on separate plates at the foray tables. Specimens can remain in wax paper if they will not be examined soon but still require individual labels. Foray tables can quickly fill up with collections. Volunteers need to work with participants to help them fill out field labels (“tags”); the minimum required is the foray number. But date, collector, locality, habitat, trees present, and substrate are valuable data.

Make sure there is a table clearly marked for edibles for the Mycophagy Committee. Check to see there is also a voucher specimen saved for each edible species (a three way struggle with voucher and display). A foray with a dye workshop may request a table for collecting dye fungi.

Participants should NEVER drop-off or take specimens to the display area. This IS often inevitable so look for this when it happens. Watch for labels on the display table that are not marked with blue or yellow, etc.

Collectors maintain ownership of their collections until the collector indicates otherwise. The collector may choose to keep a specimen or designate another person, such as a mycologist working with a particular genus. To indicate a donation to NAMA and a possible inclusion in the Voucher Program, the collector places the specimen, with the collection slip, on the foray tables.

Specimens are identified or names verified by qualified mycologists (professional or otherwise). The Voucher Committee has a list to which identifiers can be added. Genus and species names (variety / aff. / cf. / group etc.) are written on the label including any identification notes. The identifying mycologist adds their name (initials) in the box on the label. Mycologists can ID species at the foray or sort tables or take specimens to an ID table.

Specimens of the same species are NOT mixed on the same plate, especially prior to databasing and voucher selection. It is much too easy to mix specimens from different locations which makes them unusable as vouchers. Also, people often mix different species on the same plate. Fruitbodies of the same species from the same location should not be combined to yield a better collection. But if this is done, all labels are kept and stapled together.

2. The foray and sort tables need to be monitored by the voucher students and volunteers. After a walk group returns and collectors are done labeling their specimens, then each label is checked to make sure it includes the walk number, at a minimum. Any specimens without a walk number then get a label with the walk number for that table. The specimens on the foray tables (from the morning trips) need to be consolidated and then moved to other sort tables to make room for the next round of returning collectors (in the afternoon). There need to be empty foray tables available (near entrance) in the morning and afternoon prior to the return of foray groups.

Students and volunteers routinely check the sort tables for identified specimens (field label with ID and mycologist initials) and take them to the Recorder (database) table. If a list of vouchered species is available then a student or volunteer can be given permission to mark duplicates (in blue) and add to display tables. Collections with field labels can be moved from foray tables to the sort tables by group (gilled mushrooms, boletes, polypores, ascomycetes, etc.) to help experts identify them. The foray and sort tables are checked several times a day. Bad or otherwise unidentifiable or unusable collections are thrown out. Slips with ID are saved if needed.

At some forays there are many participants who collect on their own, not part of a scheduled walk. These collectors should fill out their labels with their name, date, and as complete location information as possible. Specimens lacking adequate collection and location information will not be vouchered. These poorly documented specimens will not have long term value in the herbarium. A state atlas would help people find locations.

3. Identified specimens are taken to the voucher database station. For each species a representative collection in good condition and with more complete field data is selected as a voucher. A sequential voucher number is automatically assigned as the species name and collection data are entered into the foray database. The voucher number is written on the field label on the top margin and highlighted in yellow. A small, pre-printed voucher number slip with 1 cm scale bar is placed with the voucher specimen. A second voucher can be made

later for a species if much better material becomes available. The first one vouchered is not always the best specimen, but is not discarded. A poor specimen can be set aside for a limited time by the Recorder in the hopes that a better specimen of that species comes in. Regardless of whether we are using MycoFlora labels, the voucher number slips are used as a backup with the specimens for those times when labels are lost.

“Duplicates” are non-vouchers. Their field label is marked with blue highlighting (top margin) to indicate that the voucher workers have seen the specimen and it is not a voucher collection. Non-vouchers go to the display tables. The data from these duplicates and other non-vouchered specimens are not databased or recorded by the Voucher Committee. **If the Foray organizers require a list of species from certain locations, for example to satisfy a collection permit, then they need to provide other volunteers with a method to get the needed information.** One option is to have a volunteer stationed at a table to record the duplicates before going to display. Another option is to collect all the non-voucher labels from the display tables at the end of the foray to compile the lists of species for each site.

“Aliens” are specimens that are collected from outside the area covered by the NAMA Foray activities. For example, people collect en route to the foray and the specimens are from some other state or province. These collections do not get included and counted on the species list for the foray. It is at the discretion of the mycologists and the voucher committee whether some of these specimens are vouchered or saved by other mycologists. Preferably the voucher workers mark the field label on all four edges with orange highlighter pen to indicate this as an “Alien” collection. These specimens are either integrated with the display tables or set out on their own display table.

If a mycologist or other person is retaining a specimen of a species that otherwise is not vouchered, then that collection can be entered into the database, the owner recorded (and their collection number if any), a voucher number assigned, photo taken, and returned to the owner. This ensures the specimen or species gets recorded for the foray and the database tracks who has the specimen. Whenever possible (i.e. if the collection is large enough) the collection can be split with one portion remaining in the voucher collection and the other with the interested mycologist (record who and where it will be going). It is much preferred that if a mycologist needs access to a specimen that they take the specimen (or part of it) with them from the foray and send it back to the herbarium later. There will be a delay if the herbarium is requested to process the specimen before sending it to the mycologist. The mycologist is requested to notify the herbarium of any changes to the identity of the specimen, DNA extractions, publications, and other uses. The NAMA voucher number is cited in the publication and NAMA should be cited in the Acknowledgements.

Collections that are unidentified or identified only to genus do not need to be vouchered. The mycologists or the voucher committee can decide to save some as voucher collections to be identified after the foray, particularly unusual or rare fungi. Good description notes should be written down for unknown fungi, a photograph is not sufficient. It is not the job of the museum or herbarium to identify these collections. Mycologists are very welcome to take collections from the foray for identification and send information to the Voucher Committee later. Specimens can be donated to the herbarium or the mycologist can archive them in their home institution and then send the accession information to the Voucher Committee.

4. Voucher specimens are taken to the photography station. Photographs are made of each voucher specimen, using the printed voucher number slip as identification in the photo. Later these images are assigned file names beginning with the voucher number (for example: NAMA2013-008.jpg or NAMA2013-436a.jpg and NAMA2013-436b.jpg). Names are not used because more than one voucher may be saved for a species and collections may be determined later to be a different species. Likewise, images do not have the species name added into the image. Images are edited later where necessary to make the voucher number legible or to crop the photo or adjust contrast and color balance.

5. Some forays may have persons and materials to take samples for DNA analysis. This is done after photography. If possible part of the specimen should be put on the drier immediately to prevent loss later.

6. Photographed voucher specimens may be treated in several ways, depending on condition and other factors: 1) most go directly to display tables; 2) infrequently, a specimen may be put on drier if necessary at that time; or 3) sometimes a specimen is split, with part going to the drier (with the small voucher number slip) and

part going on display (with the field label, and on the right margin written indication that part of the specimen was dried, highlighted in yellow).

Voucher specimens on display are never combined with other specimens on the same plate. People must be vigilant to prevent this. Participants always think they are helping you out by combining specimens of the same species onto the same plate, not realizing that you need them separate, usually because they are from different locations. Mistakes are also made combining similar species on the same plate. If necessary to save space, duplicates (blue labels) can be combined together (but not with vouchers), with labels kept together. People may pick up fruitbodies to look at them and then put them back down on the wrong plate. People are expected to ask permission to remove a specimen to photograph themselves. Specimens occasionally go missing.

7. Specimens on display are checked periodically to determine when they can or should be put on the driers. Species for which there are additional non-voucher collections can have their voucher specimens put on the drier sooner. Vouchers should be dried before they start to shrivel and decompose, so the display tables are checked (at a minimum) each evening for specimens needing to be dried. Drying vouchers sooner preserves their condition better (for microscopy and DNA) and reduces work load at end.

The small voucher number slip must be placed on the drier with the specimen. The field labels take up too much room on the drier so they are put in a stack to the side. It can be useful to save some of the substrate with the voucher to determine associated plants or wood but that too much is a bad thing (especially with sandy or dusty soil which can damage or dirty the specimens). Similar species should not be placed on the same rack. There should be adequate space between sets of specimens so that the next person can tell what belongs together. Very small mushrooms or those with skinny stems are put on small paper rectangles with the edges folded up (“boats”). The last evening of the foray, most vouchers should be put on the driers for packaging the next day. The alternative is to have someone responsible for taking the non-dried specimens to another location to dry them that same day. It is not good for specimens to be partially dried then taken off drier and later returned to drier. Helpers need to be instructed in proper use of driers, for example slicing larger mushrooms, not crowding specimens, ensuring that slips are not mixed up. If space on the driers is tight or the driers have active fans or forced air it may be necessary to pin the numbered slips to the specimen or place them so they do not get blown about. After every foray back at the museum we encounter bagged specimens that are mixed or with missing number slips.

8. Once specimens are completely dry (usually taking overnight), they are packaged in resealable plastic bags of appropriate size (“Ziploc” bags). The voucher number slip must be placed in the bag with the matching specimen. The field labels are typically left in a stack and taken by the Voucher Coordinator in order to later (after the foray) compare the physical label data and edit the voucher database. The labels are then united with the specimens. If specimens are not dry they will get moldy before arriving at the museum then must be thrown out. If there is a long delay before dried specimens are sent to the herbarium then they should be frozen for 7 days to kill any insects. Specimens are frozen upon arrival at the herbarium.

Some fungi are treated differently. Lichens are air-dried in open paper bags (not plastic). Slime molds can be dried then glued in small collection boxes by someone familiar with the process. Plant pathogens on leaves, etc. are best dried in a plant press, if one is available. Microfungi, such as mycoparasites should be labeled to tell workers where the actual fungus is found so the correct portion of the substrate and specimen is saved on the drier and not discarded. All fungi are given voucher numbers and databased in the same manner. The documenting of slime molds (and other non-fungi) is optional for the voucher project. A volunteer slime mold specialist is encouraged to take over the complete processing for those specimens.

We have lost specimens for the following reasons: 1) Specimens disappear at any time. Vouchers are taken without permission from ID room or from display tables. Vouchers are taken by the mycophagy workers or by people who dye with fungi. 2) Specimens are combined by mistake onto the same plate and cannot be sorted out afterwards. 3) Vouchers decompose before making it to the driers. This is a problem with *Agaricus*, some boletes, and other, often buggy, mushrooms that rot overnight. 4) Specimens and their voucher slips get mixed up on the drier. 5) Specimens are not completely dried before put in resealable bags and they become moldy before reaching the museum.