

## **HERBARIUM POLICY**

### **Revised 16 June 2014**

#### **Mission Statement:**

Rancho Santa Ana Botanic Garden promotes botany, conservation and horticulture to inspire, inform and educate the public and the scientific community about California's native flora. The Garden is devoted to the collection, cultivation, study and display of native California plants and to graduate training and research in plant systematics and evolution. Through all of its programs, the Garden makes significant contributions to the appreciation, enjoyment, understanding, and thoughtful utilization of our natural heritage.

#### **Collection Policy:**

In accordance with its mission statement, Rancho Santa Ana Botanic Garden will develop, assemble, document and maintain preserved botanical collections (herbarium). The purpose of this document is to guide, direct and manage the development of these collections at the Garden.

#### **Legal and Ethical Consideration:**

Rancho Santa Ana Botanic Garden's collections, collecting policies, procedures, and activities strive to comply with all relevant international, national, state and local laws, and trustee policies and directives regarding these collections and collecting activities (e.g., CITES, ESA, etc.). All collections and collecting activities will comply and be consistent with the Trustee approved Code of Ethics (1998 revision).

#### **Purpose:**

Rancho Santa Ana Botanic Garden's herbarium collections support the Garden's mission and its programs in conservation, education, horticulture and research.

#### **Scope of the Collections – Provenance:**

The RSA herbarium holdings are defined as those specimens belonging to Rancho Santa Ana Botanic Garden and the collections formerly belonging to Pomona College. The herbarium seeks to provide as complete a representation of different vascular plant families and genera as possible. Holdings includes traditional herbarium mounts, fluid-preserved specimens, cones and fruit, wood, root, and bark samples, and microscopic slides of anatomical and pollen preparations. The geographic coverage of the RSA herbarium is worldwide; however, primary emphasis is given to plants from California, Mexico, western North America, and other regions with mediterranean, arid, and semiarid climates.

#### **Acquisition Policy:**

The primary goal of the acquisitions policy is to guide development of the RSA herbarium as a representative world collection of vascular plant taxa by the incorporation of specimens acquired through judicious collecting, exchanges, accepted gifts, incorporation of "orphan" collections, and purchases.

The general policies governing herbarium acquisitions are as follows:

1. RSA holdings are defined as those specimens belonging to Rancho Santa Ana Botanic Garden (RSA), which include various orphaned herbaria and the collections donated to the Garden by Pomona College (POM).
2. Specimens from throughout the world will be accessioned.
3. Specimens in general must be of high quality and with adequate labels; otherwise substandard material may be accepted at the discretion of the Herbarium Curator or Herbarium Collections Manager.
4. An effort will be made to maintain corresponding voucher specimens for all RSABG living collection accessions.

5. An effort will be made to avoid accessioning duplicate collection numbers of any given collector whenever possible.
6. Precise geographic duplication is acceptable within reason, as a thorough geographic coverage documents natural variation.
7. Initiation of new exchange agreements with institutions or individuals will be on a selective basis at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager.
8. Donations of specimens to the herbarium (including incorporation of orphaned herbaria) will be accepted, but must meet established specimen quality criteria. Collections by staff are "Staff Collections," and not gifts unless collected and prepared entirely on personal time and funds.
9. Unless otherwise stipulated, all gifts become the property of RSA. In all cases, the ultimate disposition of the specimens will be at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager. Donors of material should be informed of this policy, and that RSA reserves the right to dispose of any donated specimens at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager.
10. Collections may be acquired on a fee per specimen basis at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager. All financial arrangements surrounding the purchase of specimens should be fully established and documented prior to receiving specimens, and must be in concordance with other established RSABG fiscal policies.
11. Collections of voucher specimens documenting experimental and other studies will be accepted at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager.
12. RSA will strive to determine that all specimens accessioned were legally collected and will not knowingly accept illegally collected material, unless deposited by a State or Federal Agency with accompanying documentation authorizing RSA to possess the specimens.

**Utilization:**

Rancho Santa Ana Botanic Garden's herbarium collections are to be used to support the Garden's mission and other appropriate conservation, education, horticulture and research activities. Use and utilization of the Garden's herbarium collections will be consistent with the community norms and standards for each type of collection. In general, destructive sampling will be permitted only to an extent that ensures no significant reduction in the overall quality of the accession/specimen will result from such utilization (see Destructive Sampling Policy – Appendix 1). Specimens should be handled with the utmost care at all times. Failure to adhere to herbarium policies and regulations may result in revocation of access privileges, at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager.

**Access:**

The content / catalog of Rancho Santa Ana Botanic Garden herbarium collections should be as widely accessible as possible. The Garden's philosophy is to encourage and facilitate access to and use of the herbarium collections to the greatest extent possible. Given the sensitive nature and security issues involved with some of these collections, however, access to the collections and their associated records may be limited at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager.

**Documentation:**

As collection documentation adds value to the objects in the collection, documentation should be as thorough and accurate as resources allow. All appropriate records will be maintained, and periodic inventories conducted for the herbarium collections. Collection records include (but are not limited to) documentation of provenance, utilization, procedures, quality and origin of accessions, deaccessions, exchanges, gifts, purchases, and loans. The development of a comprehensive, readily accessible catalogue of the herbarium collections, including archival quality digital images, is an institutional goal. The herbarium will stay current with emerging technologies and standards in the field, including standards in digital technologies, as appropriate.

**Collection Conservation and Stewardship:**

RSABG's Herbarium constitutes a significant scientific, horticultural, educational, and conservation resource for a community and region where species and habitat loss are critical issues. The herbarium expects to maintain museum and other professional botanical standards and to hold its collections in public trust. Rancho Santa Ana Botanic Garden Herbarium will strive to fully implement and comply with the Trustee approved Long Range Conservation Plan (2002 revision).

**Quality Standards for Depositing Specimens:**

The RSABG Herbarium regularly receives donations of specimens that are vouchers for scientific research, have historical significance, or enrich our taxonomic or geographic representation. Donations of specimens are expected to have been collected with the appropriate permission and / or official permits. Donations are only accepted for which ownership can be transferred to the Herbarium.

1. Specimens for deposit at the RSABG Herbarium will follow the guidelines as outlined in the Acquisition Policy.
2. Specimens must be of high quality and include reproductive structures (i.e., flowers, fruits, cones, spores). Substandard material, such as sterile material, may be accepted at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager.
3. Specimens acceptable for deposit must be accompanied by adequate labels printed on acid free paper.
4. Collection information for each specimen at a minimum will include determination (i.e. identification to species), collector, collection number, collection date, collection locality (political division, locality description, habitat description, geographic coordinates, elevation), and specimen description.
5. Plant specimens for deposit into the RSA herbarium must include a "Plant Specimens for Deposit" form.
6. Plant specimens mailed to the herbarium for deposit into the RSA herbarium should be packaged with care, such that little to no damage occurs during shipment.

**Deaccession:**

In all cases, the ultimate disposition of the specimens will be at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager.

Accessions may be removed from the collections (deaccessioned) under any of the following conditions:

1. When they are no longer appropriate to the scope of the herbarium collection.
2. When they are damaged beyond reasonable repair.
3. When they are missing (lost, stolen, or destroyed).
4. When they no longer retain value for their intended purpose.
5. When they are unnecessary duplicates.
6. When the legal owner requests return of material on indefinite loan.

All records and data relating to deaccessioned herbarium material will be maintained in perpetuity. Deaccessioning is the responsibility of Herbarium Curator or, by delegation, Herbarium Collections Manager.

Deaccessioned material may be disposed of in the following ways:

1. Deaccessioned material may be exchanged with an individual, corporation, nonprofit or government entity.
2. Deaccessioned material may be sold. Proceeds from the sale of deaccessioned material and/or collection assets will be used to provide for the direct care and augmentation of the affected collection.
3. Deaccessioned material may be given to an individual, corporation, nonprofit or government entity.
4. As a last resort, as in the case of irreparably damaged specimens, deaccessioned herbarium material may be physically discarded.

Decisions relating to the disposal of deaccessioned material(s) with a commercial value of up to one hundred dollars are the responsibility of the Herbarium Curator or, by delegation the Herbarium Collections Manager. Disposal of deaccessioned material(s) with a commercial value in excess of one hundred dollars will be made with the consultation and documented approval of the Garden's Executive Director, or Board of Trustees.

**Loans:**

Loans are the formal, temporary transfer of specimens to outside researchers or institutions. Specimens from the RSA herbarium are available for use on loan to researchers at outside institutions. Similarly, the RSA herbarium is responsible for managing loans from outside institutions, which have been sent for use by Garden staff, students, and research associates.

The general policies governing loans of RSA herbarium specimens to other institutions are as follows:

- Loans are made to institutions, not individuals; therefore, the Herbarium Curator and/or Herbarium Collections Manager must submit all loan requests.
- Institutions receiving loans must be able to ensure their storage in facilities and under conditions that are sufficient to provide RSA specimens an appropriate level of care and protection.
- A loan of specimens will be authorized only after receiving a formal request for the material from the director, curator, or collections manager of the herbarium to which the loan will be sent.
- Loans of RSA specimens are made for one year, unless otherwise authorized by the Herbarium Curator or, by delegation, Herbarium Collections Manager.
- Extensions of loan periods may be granted at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager following receipt of formal request from the director, curator, or collections manager of the herbarium to which the loan was sent.
- Specimens sent on loan may be recalled at any time by the Herbarium Curator or, by delegation, Herbarium Collections Manager.
- Accessions of any given taxon will not be sent out on loan in their entirety. Loans made to receiving institutions will include a portion of a requested taxon/taxa. RSA will retain approximately 25% of its holdings of a given taxon/taxa. The remaining portion may be sent out on loan to the institution following the return of the initial portion of the loan. In cases where RSA may only have a few specimens of a given taxon, decisions to send a portion or all of such specimens on loan are at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager.
- For taxa or specimens of extreme rarity, decisions to send such specimens on loan are at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager. In such cases, a high-resolution scanned image of the specimen(s) may be sent as a virtual loan. The rarest of circumstances may warrant exception.
- Institutional need for RSA herbarium specimens supersedes any and all requests for loans to outside institutions.
- Loans may be transferred to another institution at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager, pending receipt of formal request from both the original and new borrowing institutions.

The general policies governing loans of herbarium specimens sent to RSA from other institutions are as follows:

- Loans are made to institutions, not individuals; therefore requests for loans must be submitted by the Herbarium Curator or, by delegation, Herbarium Collections Manager.
- Specimens received on loan must be housed according to the basic standards for all RSA herbarium specimens.

- Loans must be returned promptly upon the expiration of the lending institution's stated loan period or upon receipt of request for immediate return of the loan.
- All specimens received on loan will be properly annotated prior to return.

**Exchanges:**

Exchanges are the formal reciprocal transfer of specimen(s) or other collection material(s) between Rancho Santa Ana Botanic Garden and other institutions or individuals. Formal exchange programs are designed to build and augment institutional holdings. Decisions to initiate or curtail exchange agreements are at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager.

**Gifts:**

Gifts are the unconditional, unilateral transfer of ownership of specimen(s) or other collection material(s) between Rancho Santa Ana Botanic Garden and other institutions or individuals. Gifts are typically given with the intent of augmenting the holdings of outside institutions or supporting research and activities consistent with the mission of the Garden. Gifts to the herbarium collections at Rancho Santa Ana Botanic Garden are typically accepted with the expressed intent of augmenting the Garden's existing collections in a manner consistent with the herbarium's collection policy.

Unless otherwise stipulated, all gifts become the property of RSA. In all cases, the ultimate disposition of the specimens will be at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager. Donors of material should be informed of this policy and that RSA reserves the right to dispose of any donated specimens at the discretion of the Herbarium Curator or, by delegation, Herbarium Collections Manager. Collections made by staff and graduate students are "Staff Collections" and not gifts unless collected and prepared on personal time with only private funds. Gifts may be claimed as tax-exempt donations. The herbarium will give gift receipts upon request but it is strictly prohibited from specifying the value of herbarium specimens; this is left to the donor's discretion.

**Risk Management and Disaster Planning:**

The herbarium will adhere to the institutional Risk Management and Disaster Plan. Collections, staff and visitors are to be protected to the best of the Garden's ability in the event of an emergency or disaster in accordance with the Disaster Preparedness Policy.

**Policy Review / Revision:**

The Herbarium Curator or, by delegation, Herbarium Collections Manager shall review the Herbarium Collection Policy not less than once every five years. The Herbarium Collection Policy must maintain consistency with the Garden's Comprehensive Collection Policy. Any revisions to the Herbarium Collection Policy shall be presented to and approved by the Collections Committee. If no revisions are deemed necessary the policy shall be noted as reviewed and dated.

**APPENDICES:**

- I. Destructive Sampling Policy
- II. Integrated Pest Management Policy
- III. Definition of Terms/Glossary

## **Appendix I to the Herbarium Policy Destructive Sampling Policy for RSA-POM Herbarium**

The policy outlined below is intended to balance the preservation of herbarium specimens with their utilization for scientific research. The removal of plant fragments from RSA-POM specimens for genetic/morphological/anatomical studies will be permitted only to an extent that ensures no significant reduction in the overall quality of the specimen. Decisions concerning destructive sampling will be made on a case-by-case basis. Each sheet will be assessed individually and approved if sufficient material is available and sampling will not compromise the integrity of the specimen.

Requests for removal of samples from herbarium specimens should be addressed to the Herbarium Curator or Collections Manager. Please read this policy statement, complete the agreement outlined below, and include a list of specimens to be sampled.

**Absolutely no material may be removed without prior consent of the Herbarium Curator or Collections Manager. Permission for removal for material, when given, is contingent upon adherence to the following guidelines:**

1. The investigator must have made a diligent and good faith effort to obtain appropriate material from other sources (e.g., field collections, horticultural sources, other herbaria, etc.) before requesting permission to sample from the Garden's collection.
2. Material may not be removed from TYPE collections, from designated historical specimens (i.e., from collections made before 1900), or from taxa represented in the herbarium by fewer than three collections. Only the rarest of circumstances may warrant exception, and the Herbarium Curator and/or Herbarium Collections Manager will then carry out sampling.
3. Specimens approved for sampling must be handled with care and impacted as minimally as possible. Approval will only be granted when there is adequate material and good cause for sampling.
4. Whenever material is removed, specimens must be annotated with reference to what material was removed, by whom, for what purpose, the project, institution, date, and ideally, any resulting publication.
5. DNA sequences generated from the sampling must be deposited in GenBank or EMBL and cite the RSA-POM specimen as a voucher.
6. The RSA-POM herbarium must be acknowledged in any publication in which data derived from any sample are used. A reprint of the paper(s) should be provided to the Herbarium.
7. Surplus material should be placed in the fragment packet, located on the herbarium sheet.
8. Any given specimen may not be sampled a second time for the same study.

## **Appendix II to the Herbarium Policy Integrated Pest Management**

The preservation and maintenance of the herbarium at Rancho Santa Ana Botanic Garden requires an Integrated Pest Management Program to assure isolation and protection of the collection from harmful pests. Various insect pests can consume dried plant material and cause significant damage to herbarium collections, many of which are of historical value and irreplaceable. Integrated Pest Management in the herbarium aims to prevent insect infestations in the collection primarily through means of a non-toxic approach (i.e., freezing). All incoming specimens or other plant materials are subject to the same procedures prior to their absorption into the collection. The following is a set of guidelines for the prevention and control of insect damage to the herbarium collection.

### **Day-to-Day Management and Infestation Prevention**

1. To help prevent insect infestation, store plant specimens in herbarium cabinets when not in use. With the exception of the herbarium workroom, specimens are not to be left out overnight. Whenever any specimens are found that have been left out overnight, they will be frozen for a minimum of three days before being returned to cabinets. Note: freshly mounted specimens or pressed specimens in the dryer will be left out overnight (to a couple of days) as they dry in the herbarium workroom only. These specimens will be frozen before filing into the main collection.
2. Herbarium cabinets must be properly closed (top and bottom of door). Some of the herbarium cabinets are difficult to close; try lifting up or pushing down on the handle and gently pressing the door closed. Report any problem cabinets to the Collections Manager.
3. Any apparent recent insect damage should be brought to the attention of the Collections Manager. When possible signs of insect infestations are detected, the adjacent herbarium cabinets will also be carefully checked.
4. As a general rule, fresh plant material is not kept in the herbarium, but on occasion fresh plants are brought in for identification. Please deliver fresh material to the Collections Manager or leave in the herbarium workroom.
5. All material entering the herbarium (as newly mounted collections, specimen loans from other herbaria, gifts, etc.) must be frozen (-20C or below), for a minimum of three full days. Three days is a guideline for loosely stacked specimens; it is critical that the actual plant material reaches and remains at -20C. In cases where loan boxes are tightly packed, they may need to be frozen for a week or longer. To maintain a constant temperature, the freezer should not be opened unless absolutely necessary.
6. The herbarium will be routinely cleaned every three months following routine inspections (see below). Cleaning entails sweeping and vacuuming floors, vacuuming floors between compactors and in compactor tracks, and vacuuming workbenches in each wing.
7. Corrugates (i.e., ventilators) will be frozen at least once a year for a minimum of three days.

## **Inspection**

1. Every three months a full inspection of ALL herbarium cabinets is conducted; this includes the main collection, researchers' cabinets, and cabinets in the basement.
2. Tools and supplies needed to conduct the inspection:
  - Headlamp
  - Paint brush
  - Fragment packets
3. Open a cabinet door, place an opened fragment packet on the bottom lip of the cabinet and using the paintbrush, sweep the contents at the bottom lip into the fragment packet. Contents in the bottom lip of the door itself are swept into the fragment packet.
4. Inspect the fragment packet for any insects, insect parts, or frass. If the contents of the fragment packet are clear of insects, tap contents into a trashcan and proceed to the next cabinet. If the contents of the fragment packet contain suspect insects, label the fragment packet with the cabinet number and the location of the cabinet (e.g., west wing, second floor; basement).
5. Suspect insects are confirmed with identification using a microscope.
6. Infested cabinets are recorded in a spreadsheet.

## **Insect Infestation**

1. The entire contents of the cabinet will be hard frozen. Specimens will be removed immediately from shelves, and bundled with corrugates and string. Each bundle is labeled with a post-it that references the cabinet number and shelf number to which it belongs. Bundles are placed in thick plastic bags with no holes. Plastic bags will trap most insects and they will die in the freezer. Bagged bundles are placed in the freezer for a minimum of three days.
2. Infested cabinets will be vacuumed.
3. Neighboring cabinets will be checked for signs of infestation.
4. Once frozen for the designated time, specimens will be replaced to the cabinet and treatment information will be recorded. Following treatment the cabinet will be checked regularly for any further infestations.



### Appendix III to the Herbarium Policy Definition of Terms/Glossary

To avoid confusion with other uses of terms for collections at Rancho Santa Ana Botanic Garden, the following definitions are provided as they pertain to this document:

1. **Herbarium** is defined as a voucher repository, including plant specimens that have been pressed, dried, pickled, or otherwise preserved for long-term storage under archival conditions, and are used as permanent record through space and time.
2. **Herbarium specimens** include all forms of plant material that have been prepared for scientific study, are accompanied by significant label data and are under the jurisdiction of the herbarium. In the case of ancillary collections this may include unaccessioned specimens.
3. **Vouchers** are herbarium specimens that specifically relate to a research project or another collection (e.g., a voucher from the living collection at RSABG, or a voucher for a morphological study that is published and cited.)
4. **California** is defined as the political unit of the state of California.
5. **Orphaned herbaria/collections** are defined as collections that are not receiving curation and become abandoned by their home institutions. This usually results in the transfer of the collection to an active herbarium in the local area.
6. **Accession** is the unit for a single collection. For the Herbarium, this represents a single sheet of a single collecting event (i.e., one taxon from one place at one time).
7. **Curation** is the process of managing a collection to ensure its preservation, perpetuation, ease of access and retrieval of data, and to provide for orderly accessions.
8. **Community standards** are defined as those standards for data-capture, data-sharing, specimen storage, handling, management and curation in the scientific (botanical and collections management) communities.
9. **Associated data** is defined as all/any meta-data associated with specimens in the herbarium. This includes but is not limited to: label data, accession data, collections management data (e.g., shipping, loan activity), curation data (e.g., condition), phenological data, digitized text, digital images, and annotations.
10. **Digitization** is defined as the process by which data from specimens is harvested. This frequently refers to either the entry of specimen label data or the image-capture of the sheets themselves.
11. **TYPE specimen** is a specimen selected to serve as a reference point when a plant species is first named. There are several different categories of types; the most common are: holotypes, isotypes, syntype, lectotype, topotypes, etc.
12. **Synoptic collection** is a quick-reference collection housed outside the main collection that contains one specimen for each species known from a given geographical area.