

Curatorial Notes: An Updated Living Collections Policy at the Arnold Arboretum

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Museums, by definition, collect things, and in the case of botanical gardens and arboreta, those things are plants. In this quest to collect, curators must exercise discipline and prudence in determining what new things to acquire as well as which ones to remove. Garden collections can be notably challenging to curate because of the overwhelming breadth of possible biodiversity to accumulate. Thus, it is essential for curators to make use of a collections policy—a tool which defines the scope of the collection. The collections policy is mission-driven; it defines short- and long-term goals and establishes the direction of collection building. While the specifics of what items to collect may occasionally be included in the collections policy, they are typically outlined separately in a detailed collections development plan. Likewise, the tactics of curation, such as the means of acquisition, intricacies of database management, standardization of nomenclature, or tasks related to plant maintenance, are best housed within a separate procedural manual.

Collections policy history at the Arboretum

Since its inception, the Arboretum has built its living collection of plants with the aid of a collections policy, although the policy's content and application have varied considerably over the years. The indenture signed by the President and Fellows of Harvard College and the Trustees of Mr. James Arnold on the 29th of March, 1872, included the original collections policy:

"The Arnold Arboretum... shall contain, as far as is practicable, all the trees, shrubs, and herbaceous plants, either indigenous or exotic, which can be raised in the open air at the said West Roxbury..."

It was simple, direct—and too broad for Charles S. Sargent, the Arboretum's first curator and director. While he followed the spirit of the indenture's charge with aplomb, acquiring as many taxa as possible, the focus quickly

shifted almost solely to woody plants, leaving most herbaceous plants out of the permanent collections. His keen interest in the floras of North America and eastern Asia, no doubt influenced by his mentor Asa Gray, led to substantive biogeographic collections from these locales. And Sargent's fascination with ornamentals resulted in the acquisition of many horticultural plants, including great numbers of botanical formae and varieties that are now considered cultivars.

Sargent (1922) estimated that during the Arboretum's first half-century some 6,000 taxa grew in the collections. But space became limited in the 265-acre landscape, and the collections became crowded. The problem became acute in the years following Sargent's death in 1927; in the absence of his careful direction the collections multiplied unchecked. To respond to this dilemma, landscape architect Beatrix Farrand was hired in 1946 by Karl Sax, Arboretum director at the time, to create a restorative plan. In her assessment (Farrand 1946), she questioned whether "the comparatively small acreage of the Arboretum can wisely accommodate all the species and varieties of woody plants of the temperate regions." The recommendation that she and the Administration came up with was that the collections grown in Jamaica Plain would be "the best and most ornamental"; research plants that lacked the desired showiness, yet had scientific merit, would be transferred to the Case Estates in Weston, where they could be lined-out in experimental nurseries. This strategy's execution was left to Donald Wyman, the Arboretum's horticulturist. Wyman undoubtedly sighed in relief with this decision. He acknowledged (Wyman 1947) the difficulty of maintaining an expanding number of plants solely at Jamaica Plain given the institutional reticence to modify any collections following Sargent's death (particularly those that Sargent had a hand in building). In theory, this split-site solution allowed the living collections to



HERBERT W. GLEASON, ARCHIVES OF THE ARNOLD ARBORETUM

Arboretum planting space was already filling up when this photograph was made in May of 1930, a few years after Sargent's death. The photo shows Korean azalea (*Rhododendron yedoense* var. *poukhanense*) and other plants on Bussey Hill.



Starting in the late 1970s, the Arboretum shifted its priority to collecting plant material of documented wild origin. Representative plants collected on expeditions made during this period include (clockwise from upper left): *Weigela subsessilis* collected in the Republic of Korea in 1977, *Sorbus yuana* collected in the People's Republic of China during the Sino-American Botanical Expedition in 1980, and *Cotinus coggygria* from the 1980 expedition to the Russian Federation (then the U.S.S.R.).

remain comprehensive—as per the original collections policy of 1872—while providing focus to the two sites: research collections in Weston and ornamental collections in Jamaica Plain.

For the next 30 years, this practice continued and the Arboretum landscape in Jamaica Plain accrued great numbers of ornamental taxa, particularly cultivars under evaluation. This swing was reinforced by the post-war proliferation of cultivars introduced by the nursery industry, the institutional goal of becoming a showcase of horticultural material, and practically complete cessation of plant exploration efforts. It is important to note that while the collections policy did not shift, *per se*, its method of realization did.

In the late 1970s, a shift again took place—this time with an eye towards documentation, the prime metric used to assess a collection's value. While material of cultivated origin may carry with it notable documentation, its value is generally eclipsed by material of wild origin, particularly once it has been verified to identity. Thus, in a new living collections policy, priority shifted away from ornamental and toward botanical taxa (Spongberg 1979). While the emphasis was placed upon botanical taxa of wild origin, provisions were in place to accession or maintain garden-origin plants (as temporary placeholders), as well as cultivars—provided they were of historic significance (*i.e.*, those with Latinized epithets proposed prior to 1953). This policy change coincided with the reinstated tradition of field collection of germplasm, both domestically and abroad. As a result, many new acquisitions of documented wild origin again crossed the Arboretum's threshold, particularly in Jamaica Plain. With respect to the practice of growing material in both Jamaica Plain and Weston, Peter Ashton (1979) reflected that the two-site strategy had come at a cost: the loss of valuable germplasm which did not survive the transfer from Jamaica Plain to Weston, including original introductions of species by E. H. Wilson and other explorers. The ambitious goal of acquiring everything—maintained in two separate sites—was too lofty, particularly with the resources available, and Jamaica Plain was deemed the primary repository.

This formal policy direction was sustained for the next decade, and then reaffirmed in 1991 (Liv-

ing Collections Long-Range Planning Committee 1991). As in the 1979 version, the goal stated that “the living collections of the Arnold Arboretum were to consist of a scientific collection of entities tied to botanical, not horticultural nomenclature.” Because the emphasis was placed on names and not necessarily taxonomy, a great deal of space in the new policy was dedicated to the “problem of cultivars and their relationship to taxa of infraspecific botanical rank.”

The need for a collections policy update

Shortly after joining the staff as Curator of Living Collections in January of 2007, I convened the Living Collections Committee to review the Arboretum's existing living collections policy and place it in context with current, as well as future, institutional needs. After thorough discussion and assessment, we restructured the policy with several broad goals in mind:

- The policy needs to describe the entire scope of our living collection, including collections that previously had not been highlighted such as the Larz Anderson Bonsai Collection and plants in our natural areas. It should also articulate levels of commitment, or priority (*i.e.*, high to low), depending upon the type of collection. This would allow us greater flexibility as well as focus in collections development.
- The policy should not perpetuate the hierarchy between wild-origin and cultivated material. Instead, the emphasis should be placed on the level of documentation associated with individual accessions, as well as their programmatic use(s) in furthering the mission of the institution. This is particularly important when we consider the immense research potential of the collections (Dosmann 2007).
- The policy must be clear and usable, yet not burdened by too many details; the policy was not intended to be a procedural manual. Instead, we appended it with a list of operational definitions to aid in interpretation.

Here is the result: the current living collections policy for the Arnold Arboretum. Notice that in spirit, it has remained true to the original plan of 1872; additional details have been added for clarity and for establishing organization and a sense of priority. Interspersed within the official policy below are text boxes and figures that provide illustrative examples and additional information.

Living Collections Policy

Policy reviewed and approved on 10 September, 2007

MISSION STATEMENT

The Arnold Arboretum of Harvard University discovers and disseminates knowledge of the plant kingdom to foster greater understanding, appreciation, and stewardship of the Earth's botanical diversity and its essential value to humankind.

I. INTRODUCTION

A. PURPOSE OF THE LIVING COLLECTIONS POLICY

The Living Collections Policy of the Arnold Arboretum guides the development, management, and enhancement of the institution's Living Collections, and applies to all plants outlined below under Scope of the Living Collections. The Living Collections Policy is written and administered by the Living Collections Committee, which comprises the Curator of Living Collections (Chair of the Committee), Deputy Director, Manager of Horticulture, Manager of Plant Records, Manager of the Dana Greenhouses and Nursery, and Senior Research Scientist; it is further reviewed and approved by the Director. The Living Collections Policy is reviewed every five years and revised as needed. Operational procedures related to implementation of this and related policies are detailed in the Arboretum's *General Procedures for Managing the Flow of Plants through the Department of Horticulture* (January 2007).

B. PURPOSE OF THE LIVING COLLECTIONS

The Living Collections of the Arnold Arboretum are essential to achieving its mission as a research institution dedicated to improving the understanding, appreciation, and preservation of woody plants. As a national and international resource for research in the various fields of plant biology and beyond, the Arboretum's Living Collections are actively developed and managed to support scientific investigation and study, as well as key educational and amenity roles.

C. LEGAL AND ETHICAL CONSIDERATIONS

Activities related to the development, management, and use of the Arnold Arboretum's living collection comply with all relevant local, state, federal and international laws. This includes compliance with all necessary documentation and phytosanitary require-

NANCY ROSE



***Phellodendron amurense* (Amur cork-tree; fruit shown at left) is currently monitored for its invasive potential in the Arboretum. Spontaneous trees have been removed, and female trees lacking sufficient documentation have been deaccessioned as a means of limiting seed production. However, other individuals of documented origin—some representing unique provenances—remain in the collection because of their high scientific value.**



Nearly 500 plant genera are common to both North America and eastern Asia. Many representatives of this disjunct group are included in the Arboretum's collection, including two strikingly similar *Cornus* species, *Cornus alternifolia* from North America (left) and *Cornus controversa* from eastern Asia (right).

ments during acquisition and distribution activities. All taxa are evaluated for their potential invasiveness, and should invasive or potentially invasive plants be retained for their scientific value, additional management procedures are put into place for containment purposes; they are not distributed for horticultural use.

II. SCOPE OF THE LIVING COLLECTIONS

The Living Collections are divided into three primary collection categories: Core, Historic, and Miscellaneous Collections; within each are secondary collections. This organization allows priority to be assigned to all extant, as well as potential, accessions within each category, thus guiding collections development, management, and enhancement. It should be noted that none of the primary, or secondary, collections are mutually exclusive and that many accessions fall into multiple categories.

A. CORE COLLECTIONS

The Core Collections are of highest priority and receive the greatest focus with respect to development, management and enhancement. In general, these collections are intrinsic to the mission of the institution through their research use, and preference is placed on material of documented wild origin. Exceptions to provenance requirements are made only in specific cases when the value is significant enough to warrant accessioning. By and large, these collections are regarded as obligatory.

1. Biogeographic Collections

Collections representing the floras of eastern North America and eastern Asia have been an important traditional focus, strongly supporting research related to the floristic relationships between these two regions. In particular, eastern North American-Asian disjunct taxa receive high priority with respect to collections development.

2. NAPCC Collections

As part of its commitment to the North American Plant Collections Consortium (NAPCC), the Arboretum maintains and develops collections of botanical taxa



Interspecific diversity is attained by growing as many species as possible within each of these high-priority genera. To increase intraspecific diversity, we strive to acquire germplasm from multiple provenances of each species so that we may illustrate genetic variation as a function of geographic source.

Japanese beech (*Fagus cre-nata*) is just one of the species of beech grown as part of the NAPCC collection.

within the following genera: *Acer*, *Carya*, *Fagus*, *Stewartia*, *Syringa* and *Tsuga*. Because they serve as national germplasm repositories, development and maintenance maximizes both inter- and intraspecific diversity.

3. Conservation Collections

As part of its commitment to the Center for Plant Conservation (CPC), the Arboretum maintains and develops collections of the following species: *Amelanchier nantucketensis*, *Diervilla rivularis*, *Diervilla sessilifolia*, *Fothergilla major*, *Ilex collina*, *Rhododendron prunifolium*, *Rhododendron vaseyi*, *Spiraea virginiana*, and *Viburnum bracteatum*. These species, as well as other taxa of conservation value outside the scope of CPC, are developed and maintained with the goals of preserving as high a level of intraspecific diversity as is practicable.

4. Synoptic Collections

Collections of documented wild-origin species that together provide a synoptic representation of the woody flora of the North Temperate Zone are maintained and developed. Emphasis is first placed on generic diversity, and then inter- and intraspecific diversity as is practicable.

The goal of a synoptic, or comprehensive, collection is to include the broadest possible representation of the item or group being collected.

At the Arboretum this means seeking the greatest breadth across all families that contain woody plants. The Arboretum's synoptic collections cannot contain every woody species, let alone every botanical variety or subspecies, so representative genera and species are selected based on institutional priorities and available space.

B. HISTORIC COLLECTIONS

The Arboretum's early contributions to plant exploration and horticultural improvement are manifested in a number of Historic Collections. In general, these collections are obligatory and maintained, but not actively developed except in cases where authentic material of Arboretum origin can be repatriated or the material is sufficiently unique to warrant accessioning.

1. Arnold Arboretum Accessions

Plants collected by early Arboretum staff (e.g., C.S. Sargent, E. H. Wilson, J.G. Jack, J. Rock) may lack sufficient documentation, or be of garden origin. However, because they represent important historical chapters in the development of the institution, they are maintained in the Living Collections. In some cases, these accessions may represent genotypes no longer extant in the wild because of local extinction and thus have high conservation value.

2. Nurseries and Horticulturists

Accessions derived from historically significant nurseries, botanical institutions and horticulturists (e.g., H. J. Veitch, T. Meehan, M. Vilmorin) may lack full documentation, but are maintained in the Living Collections. These often represent the initial introductions of species into cultivation and are, in all probability, wild-collected. In some cases, these accessions may represent genotypes no longer extant in the wild because of local extinction and thus have high conservation value.

3. Distinctive Cultivar Collections

Early in its development, the Arboretum established diverse collections of garden selections now regarded as cultivars within various plant groups (e.g., dwarf conifers, *Malus*, *Rhododendron*, *Syringa*). Because of their period and oftentimes comprehensive nature, these collections are maintained but not developed.



NANCY ROSE

In 1885, C. S. Sargent described the goals of the Peters Hill landscape as housing “a collection for investigation which need not necessarily be permanent.” Otherwise known as discretionary collections, these have often reflected the research interests of staff scientists. Prior to the substantial *Malus* collection (shown above), which grew through the work of director Karl Sax and horticulturist Donald Wyman, Peters Hill was home to extensive *Crataegus* collections—a long-term research project of Sargent.



Hydrangea paniculata 'Praecox' is an old cultivar with a Latinized epithet. Originally collected in Japan by C.S. Sargent in 1892, this Arnold Arboretum introduction is noted for its precocious floral displays, blooming at least a month before typical plants of the species.

4. Cultivars with names proposed prior to 1953

The Living Collections contain a number of historic cultivars with Latinized names that were proposed in a botanical context prior to 1953. While not developed, these are maintained, particularly when they represent material unique in cultivation.

5. Arnold Arboretum Cultivar

Introductions

Throughout its history, the Arboretum has selected and introduced a number of clones for ornamental use, many of which were initially regarded as botanical formae but are now recognized as cultivars. Because they arose at the Arboretum, they are maintained and development occurs only to repatriate genotypes lost by the Arboretum.

6. Larz Anderson Bonsai Collection

The Larz Anderson Bonsai Collection, while not actively developed, is of high priority within the Arboretum's Living Collection because of its historic and aesthetic value.



In addition to housing permanent collections that require high maintenance, The Leventritt Shrub and Vine Garden also displays outstanding ornamentals with exemplary traits. Shown here is accession 178-93-A, *Forsythia* 'Courdijau'.

C. MISCELLANEOUS COLLECTIONS

In addition to those within the above collection categories, The Living Collections comprise a number of plants grown to achieve display effects, for interpretation, for evaluation, or that may fall outside of traditional scope and not even be accessioned. However, because they play important roles in the Arboretum's research, horticultural and educational work, they are included within the Living Collections. These may be obligatory or discretionary, and development and maintenance decisions are made on a case-by-case basis by the Living Collections Committee.

1. Display Collections

Plants of cultivated origin, particularly cultivars selected for unique traits, serve important research and education roles; however their primary value is for display. Examples include ornamentals with exceptional ornamental qualities, landscape plants well suited to the New England climate (including those with stress-, insect-, and disease-resistance), as well as those under evaluation. These collections are regarded as discretionary and are developed and maintained as needed, with the acknowledgement that accessions may be deaccessioned when their value no longer meets the appropriate standard.

2. Natural Areas

The Arboretum landscape contains several natural areas representative of the New England Flora. Generally, these are maintained through natural regeneration of the present vegetation; however development may occur under certain circumstances (e.g., restoration following major disturbance).

3. Spontaneous Flora

Spontaneous generation of native, as well as exotic, plants occurs throughout the Arboretum's cultivated landscape. As a matter of course, some of these plants are removed because of their noxious characteristics, some are left in place, while others are accessioned (in particular spontaneous interspecific hybrids or landscape specimens). The forthcoming *Policy on the Spontaneous Flora* addresses this category more thoroughly.

4. Dana Greenhouse and Nursery Collections

A number of plants are cultivated at the Dana Greenhouse and Nursery for experimental, observational, and other programmatic functions outside the scope of production for the accessioned Living Collections. Development and maintenance lies with the primary investigator or other assigned staff member, with the understanding that these may be formally accessioned at a later time.



SHEILA CONNOR

While they may not contain formally accessioned plants, several natural areas in the Arboretum (including the North Woods, above) are managed as part of the living collections because of their research potential as well as intrinsic beauty.

APPENDIX: DEFINITION OF TERMS USED IN THE LIVING COLLECTIONS POLICY

An **accession** is the basic unit of a collection and identified by a unique accession number. By definition it represents a single taxon, from a single source, acquired at one time, and through one means of propagation. An accession may comprise a single plant, or multiple plants, each identified by a letter qualifier following the accession number, or in the case of mass plantings, MASS.

Accessioning is the process of adding specimens to the Arboretum's Living Collection and occurs at the time of entry regardless of its stage (e.g., plant, cutting, scion, seed). All accession records are permanent and are not expunged should deaccessioning occur.

Acquisition of new accessions may be through field collection, exchange, gift or purchase. All acquisitions must meet specific collections development goals in accordance with the Scope of the Living Collections detailed in this Living Collections Policy.



MICHAEL DOSMANN

The label for accession 638-88-C, *Fraxinus tomentosa*.

A **collection** is operationally defined as a group of accessions organized by a particular category for curatorial, educational, research, display or other use. A collection need not be physically grouped together, and a single accession may be part of multiple collections. From the perspective of commitment, collections may be discretionary or obligatory.

Curation is the process of managing the Living Collections to guarantee its conservation, guide its development, ensure its documentation, and facilitate its enhancement.

Deaccessioning is the process of removing a living specimen from the collection, but does not include the removal of any records related to that accession. Deaccessioning decisions are made by the Curator of Living Collections, in consultation with the Living Collections Committee.

Development is the process by which the Living Collections undergo change through the acquisition of new accessions and the deaccessioning of accessions no longer needed in accordance with the Scope of the Living Collections detailed in this Living Collections Policy.

Discretionary collections can be regarded as temporary or permanent. They meet specific research, display, education or other programmatic needs, but do not necessarily represent collections central to the mission and purpose of the Arboretum.

Enhancement is the process of adding value to the Living Collections through documentation, research, and other means.

The **Living Collections** comprise all plants formally accessioned, and in a broad sense also contain unaccessioned plants in natural areas, spontaneous flora, and research material.

Maintenance, from the standpoint of curating the Living Collections, is the practice of vegetatively repropagating an obligatory accession in order to preserve and perpetuate its genetic lineage. Multiple accessions of the same lineage are genetically identical.

Obligatory collections are considered permanent and represent collections central to the mission and purpose of the Arboretum.

A **taxon** (plural, taxa) is a unit of any rank within the taxonomic hierarchy (e.g., family, genus, species, variety, cultivar).

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SYLVIA WINTER



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Last year a decision was made to deaccession a prominent winterberry holly, *Ilex verticillata* 22879-F, from its location along Meadow Road across from the Visitor Center. Although it was a noteworthy specimen that consistently produced copious fruits, its large size (nearly 25 feet in diameter) prevented access to one of the original *Metasequoia glyptostroboides* (524-48-AA). An examination of the records showed that the holly was of unknown origin—not even a nursery source—and that seven other vigorous plants of the accession remained in the collection.