Museum Assessment Program

Collections Stewardship Assessment Final Report

The Museum Assessment Program (MAP) is supported by a cooperative agreement between the Institute of Museum and Library Services and the American Alliance of Museums.
ABOUT THE MUSEUM ASSESSMENT PROGRAM

The Museum Assessment Program (MAP) is a national, voluntary program which helps museums strengthen operations, plan for the future and meet standards through self-study and a consultative site visit from an expert peer reviewer. The program offers several assessment types that focus on multiple aspects of museum operations, allowing participants to work on various methods of self-improvement. Since 1981 over 5,000 museums have participated in over 6,500 assessments. MAP is supported through a cooperative agreement between the Institute of Museum and Library Services (IMLS) and the American Alliance of Museums (AAM), and administered by AAM. For more information, visit www.aam-us.org and www.imls.gov.

ABOUT THIS REPORT

This report reflects the Peer Reviewer’s knowledge and perspective based on what was provided in the museum’s MAP Application, its Self-Study Workbook and what he/she saw or was told while on the site visit. The report is a snapshot in time—from when the reviewer was there and what he or she saw and heard. The museum may have already addressed some issues discussed with the Peer Reviewer or made progress on some items listed in the report. The Peer Reviewer conducted this assessment on a volunteer basis and was selected by AAM in consultation with the museum.
American Alliance of Museums
Museum Assessment Program
Collections Stewardship Assessment

The University of Delaware
Botanic Gardens

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Executive Summary

The University of Delaware Botanic Gardens has been an integral part of the College of Agriculture and Natural Resources (CANR) since the 1950s. Located south of the University’s main campus, the garden serves as a living laboratory that supports the plant sciences as well as nearly 40 courses from CANR and other colleges.

A diverse, well-documented plant collection of native and non-native trees and shrubs provides a field laboratory for the study of plant materials. Ongoing planting since the 1950s has added to the collection’s scope and diversity. Some specimens on grounds are now approaching 60 years in age and offer examination of a mature plants form and habit. Some specimens are magnificent.

The primary purpose of the garden is education. As testimony, an impressive list of university faculty and alumni have benefited from or contributed to the plant collection and gardens. Many of these individuals have gone on to make contributions to the nursery, landscape and public garden industries. At present, internships provide students with an opportunity for hands on learning in the care and management of the collections.

The institution has thrived and the current mission of the University of Delaware Botanic Gardens recognizes its potential: *University of Delaware Botanic Gardens contributes to an understanding of the*
changing relationships between plants and people through education, extension, research and community support.

Yearly spring and fall Plant Sales are popular with the community and currently generate approximately $90,000 in income. Several events and programs are also presented throughout the year. The Garden’s membership program includes 300 members and a strong volunteer program provides tremendous in-kind support, especially within the nursery and in staffing the plant sales.

The current level of physical interpretation consists of outdoor entry signs, kiosks and individual specimen labels throughout the garden augmented with indoor maps and additional information in the office complex (open during business hours). Much more information, including plant lists, is available on the web. This base-level of interpretation allows, as resources become available, for phased incremental advancement with significant public impact.

In October 2016, the Garden completed a Master Plan to unify the various components of the garden and to set an ambitious path into the future. The plan was the result of the work of a comprehensive committee representing a broad range of constituents served by the garden.

The goal of the Master Plan is to serve CANR by enhancing the gardens educational impact, improving the collections and display, developing a regional reputation and exemplifying CANR’s interdisciplinary public roles as a destination for plant, garden, and sustainable-systems enthusiasts. The plan will guide the growth and direction of the gardens for the next 25 years. The Master Plan will also broaden the Garden’s approach toward plant acquisition, plant records and collection management.
In light of the impact the Master Plan may have on the plant collection, UDBG proceeded with a Collections Stewardship Assessment, part of the Museum Assessment Program (MAP) administered through the American Alliance of Museums (AAM). After a one-year process of self-assessment and institutional activities, UDBG’s self-study concluded that the MAP could best assist them by helping the Garden to: prioritize long-term collections management; revise collections policies and procedures; assess needs in the areas of collections management staffing.

A site visit was conducted on grounds over two and a half days during July 25-27, 2017. During the visit we had the opportunity to tour the entire grounds and facilities and meet with staff. As a result of the site visit, subsequent review of the extensive documentation provided, and review of both the AAM Characteristics of Excellence and Core Documents Verification, we present eight main recommendations.

1. Raise the awareness of the garden’s value both internally and externally (two elements listed in detailed section)
2. Improve the momentum and continuity of work accomplished by garden staff, especially through seasonal internships
3. Communicate the limitations of staffing by developing detailed and focused collection management tied to staffing levels
4. Review Collection Policy and update as needed
5. Submit the gardens collection of *Styrax* for inclusion in the Plant Collections Network
6. Seek ArbNet Accreditation
7. Estimate Master Plan garden staffing and collection management impacts.
8. *Initiate Bold Success!* Divide and conquer College Ave plantings to herald progress guided by the Master Plan
Garden History

The University of Delaware Botanic Gardens began during the late 1950's when a variety of specimen trees and shrubs were planted near Ag Hall. Located at what is now called Townsend Hall, a diverse planting of conifers, broad leaved evergreens, flowering shrubs are exhibited along a raised bed parallel to College Ave.

Plant acquisitions are prioritized to help support undergraduate horticulture education through the development of a field laboratory that supports plant science coursework. Since the 1950s, the collection has had the input of plant experts such as Dr. Richard Lighty, Dr. Charles Dunham and Mr. William H Frederick Jr.

In the 1970s the Clark Garden was formally established west of Townsend hall through a donation by Emily Clark Diffenback. Many of these plantings are still present and form a screen that borders College Ave. In 1992 an Herbaceous Garden was planted and the name University of Delaware Botanic Garden was formally adopted.

In 2006 the College of Agriculture and Natural Resources Administration formerly recognized the Garden and hired its first director, Dr. John Frett, who still provides leadership for the garden.

Today nearly 3,000 individual trees and shrubs make up a plant collection that includes 12 gardens spread over 15 acres. Nearly 1,400 taxa are represented in the documented woody plant collections. Many native and nonnative trees and shrubs are established throughout the grounds including a diverse collection east of Worrilow Hall. The Botanic Gardens also serves as a Magnolia Society Test Garden and a Test Arboretum as designated by the American Holly Society. These two genera are still well-represented in the collections.
Mission and Planning

The mission of the University of Delaware Botanic Gardens: The University of Delaware Botanic Gardens contributes to an understanding of the changing relationships between plants and people through education, extension, research, and community support.

Master Plan

As the reviewers readily discovered, the UDBG lacks a clear entry point, one that says to visitors “start here.” And while the entire collection and gardens are worth seeing and experiencing, there is no clear wayfinding for visitors (or students) to ensure that this happens. To address this and to broaden the garden’s educational impact, a Master Plan was completed in October 2016.

The Master Plan will guide the gardens development toward a more immersive garden experience and iconic presence on South Campus. Components of the Plan will create a clear primary entry and improved wayfinding and circulation. A redesigned College Ave Streetscape will create a definite awareness of the garden and public street-face for CANR.
The new Master Plan also led to the development of new draft mission and vision for the Garden. The proposed new mission statement: The mission of the University of Delaware Botanic Gardens at Newark Farms is to educate, inspire, and increase understanding of plants, landscapes, and natural systems.

An emerging new vision for UDBG

- Establish a University teaching garden and simultaneously a garden for public inspiration and enrichment.
- Create a University of Delaware gathering place for welcoming and engaging the community in a visible way.
- Become a recognized public garden in the Delaware Valley.

Proposed new gardens, habitats and an arboretum will broaden the gardens approach to plant collections. With expanded, additional and broader new gardens and habitats, there will need to be broader approach to plant records. Planning should take place now to create and trial draft or conceptual policies and procedures that will be required for the plant types (as perennials) and gardens (as organic gardening) that will be included in the expanded gardens.

Collection Policy changes in light of new Master Plan

The Master Plan (re)conceives the Garden as a set of interdisciplinary Garden Typologies in order to best serve the CANR and public audiences:

- Teaching and Learning Gardens
- Working Gardens
- Habitat Gardens
- Display and Collections
- Research Gardens

Since the current record system is focused on the ‘classic’ ‘Display and Collections Typology’, the records and information management system will need to be expanded. Since the different kinds of gardens can require different information (and precision) beyond specimen name and location,
peer gardens that have addressed the situation should be consulted (as through APGA professional sections and workshops.)

- **Teaching and Learning Gardens** will bring the issues of what classes use (plants, space) beyond the individual-specimen-records structure.
- **Working Gardens** may not require integration with the plant records per se, but have their own data and information management needs.
- **Habitat records** will likely need to be geospatially conceived and will bring the Gardens into tracking organisms other than plants, again for CANR course use. Consultation with the faculty who help develop these types for the records needed for their purposes will be needed as these are developed.
- **Herbaceous records** are a subset of the Display and Collections type, and herbaceous collections and records already exist. At present these records are not part of the woody plant records and they need to be migrated into the encompassing plant records system as a first step towards an information management system.
Development of an Interpretation Plan

The Master Plan also integrates expanded interpretation of the gardens to create a more immersive and educational experience for visitors. Per Dr. John Frett, “The completion of the master plan will expand mission to encourage greater interaction with the public. This will necessitate a change in the interpretation of the collections so general public will appreciate the collection for the multiple roles it will serve.” In order to meet this objective, a phased Interpretation Plan that integrates on-site, on-demand (as web-printed) and web interpretation (including mobile-device friendly) is needed.

Connectivity with CANR Agricultural Research and Ecology Woods

Currently there is separation between the UDBG and the Agriculture research area. The Master Plan will incorporate relocated organic gardens as well as the Wilson Homestead Garden for a broader plant-immersion experience. This will allow visitors to view and learn about agricultural research; however there will be no direct visitor access from the garden. Visitor access into these areas could create a health or research integrity issue.

Ecological Woods will play an important role in the new Master Plan. Plans call for visitor access which is not available at this time. A perimeter meadow walkway will provide views into the woodland and provide learning opportunities about this preserved habitat. A boardwalk with viewing platforms will be included through a portion of the woodland's interior and will provide an opportunity to experience the forest. This bulk of the woodland will be reserved for research.

Opportunities Inherent with the Master Plan

The programmatic success of the Master Plan will in part be based on building connections with associated Plant Science alumni. The UDBG development staff will need to build the relationships to work with departmental faculty, staff, and the UD Alumni Office to contact all past departmental alumni to
initiate contact and welcome engagement. This will include working with the UD Development Office (long term) on how contributions to the Gardens fits within Class Campaign Goals. It is also an opportunity to begin forging new connections with the public and community to help build momentum for the master plan. A key step here is to develop a list of key mission-related institutions and their officers and develop an Engagement Plan.

Gardens

Clark Garden – Older specimens of trees and shrubs can be found throughout the lawn area and on a raised mound adjacent to College Avenue. Exceptional specimens of *Pseudolarix*, *Tsuga* and *Acer palmatum* can be found here. A removal/renewal program is underway here and needs to be structured as a priority in the institutional planning.

Dunham Entrance Garden – Adjacent to the Creamery, this garden provides a diverse landscape that serves as an entry point near the handful of dedicated parking meters for UDBG. A hardscaped paver patio includes benches. A small wooden gazebo includes a color map of the grounds. This area is in need of developmental pruning and the gazebo could use a face lift.

Native Garden and Lepidoptera Trail – This display garden has native plants that are pollen and food sources for butterflies. Many interpretive signs highlight butterfly species and their life cycles. This is an exceptional example of collaboration with another UD department that can serve as a model for additional interpretive landscapes.
**Herbaceous Garden** – is a sea of color and texture of native and nonnative perennials. A favorite destination for visitors coming from the Creamery and a Potential priority case for trialing records system to include perennials.

**Landscape Color Trial Garden** – This year trials include colorful beds of coleus, petunia, lisanthus, asclepias and more. The trials present an easy opportunity for interpreting CANR-based research and industry links to the public.

**Ecology Woods** - Not open to the public, the 35-acre Ecology Woods serves as a field laboratory for Entomology and Ornithology.

**Climate Zones at Townsend Hall** - Two protected courtyards opening to the East side of Townsend Hall provide microclimates that are perhaps an entire zone warmer than Newark, Delaware. Found here are many plants suitable for a more southern, warmer climate. Public interpretation needed since so much is likely not familiar, and naïve use in home gardens will likely be a failure.
**Fischer Greenhouse Garden** – Once the site of the Holly research collection many of the older research plants have been removed. Selections of mature American hollies remain and have been limbed up and under planted with a variety of ornamental shrubs and small trees. This area was well-maintained and labeled. A sign interpreting the area's themes would be helpful.

**Worrilow Hall Garden North and South** – A diverse collection of older Magnolia species are located on the south side of the building. The larger, mature plants are part of the Magnolia Society test garden. The north side of Worrilow Hall offers a selection of mostly nonnative trees and shrubs. Pending construction could impact many of these collection plants.

includes interpretation and **Wetland Garden** – is a habitat garden built as a sustainability demonstration. The area thus its prioritization in the current resource planning may be lower.

**South Greenhouse Garden** - Herbaceous gardens provide beauty, inspiration and sustainability. The Greenhouse Garden encourages and demonstrates turf-less lawns.

**Collections**

The purpose of the collections is to support the educational mission of the garden. The primary audience is students and faculty of the University of Delaware.

Nearly 3,000 individual trees and shrubs make up a plant collection that includes 12 garden areas spread out over 15 acres. Nearly 1,400 taxa are
represented in the plant collections. Collection plants are grown as individual species, in mass plantings and as part of landscapes or displays.

Per the Collection Policy, emphasis is placed on the following genera:

- Acer
- Baptisia
- Calycanthus
- Camellia
- Carpinus
- Corylopsis
- Crataegus
- Hydrangea
- Ilex
- Itea
- Magnolia
- Mahonia
- Osmanthus
- Pinus
- Quercus
- Styax
- Viburnum
- Genera in the Hamamelidaceae

However an increasing amount of visitation is coming from the surrounding community which will become more of a priority in the emerging Master Plan.

**Collection Policy**

The collection policy currently includes operational issues as prioritized genera, accessioning, labeling, and inventory procedures. We recommend considering the addition, as the initial overarching introduction of the Policy, of a specific reference to the applicability of UD and / or AAM Code of Ethics as well as an invasive plant policy (as the ‘Saint Louis Convention’ of the Missouri Botanical Garden). An *Institutional Code of Ethics* is a required AMA Core Document.

As part of moving into the Master Plan, it will likely be useful to succinctly state, for each garden and/or collection, how it uniquely contributes to the educational roles of the Gardens and CANR.
The issue of Tributes (gardens, gazebos, benches, objects as existing sculpture) and plants is not currently addressed and needs to be resolved. Tributes need to be acknowledged in the Collection Policy and tracked with the records system, but in itself the issue properly falls as a joint responsibility of Collections, Development, and Administration to resolve and adopt a policy of tribute terms, what records are kept, by which unit, labeling and review protocols, etc. Within APGA member gardens there is a wide range of models for different contexts – benchmarking against peer institutions is recommended.

The long-term integration of the Plant Records (indeed, all collection information) backup into the automated daily protocols of the University is essential. Based on other universities with which the assessors are familiar, if an information system is not part of the University’s standard back-up regimen, then the information (and whatever programs are related to it: here meaning the entire Gardens) are ultimately faculty projects that do not rise to University commitments or resources. This is congruent with the protocols of university museums and libraries. Put another way, if the university IT protocols don’t back up a system (inherently part of Risk Management), then the university is tacitly willing to lose it. This discussion will likely not resolve immediately, will result in varied directives from the IT unit of the University that must be met, and will involve budgetary and staffing impacts.

**Plant Records**

Nearly 1,400 taxa and 3,000 individual plants comprise the Garden’s living collection. Plant records are stored digitally on the database software BG Base/BG Map. The software was developed specifically for plant collections and is used by many public gardens. The Plant Inventory is available online and is regularly updated – a meritorious level of public service.
The database contains accession and plant records for individual collection plants. Accession records include the plant’s accession number, plant name, date received, source and comments. Plant records include accession number, plant name, garden location and evaluation comments. Additional information of value to the garden is also stored.

The exact location of collection plants on grounds are mapped via GIS. A grid system layout of the 12 garden areas includes approximately 30 sections. This grid and section map is of use to collection management and is also available online.

Woody plants are recorded and accessioned when received. Plants in the nursery destined for the collections are given a standard yellow accession label. Deaccessioning procedures are in place but it is noted that there can be challenges with this information making its way to plant records especially with removals on grounds.

Currently, 80% of collections have been audited within the last four years with goal to audit the remaining collections is within next 5 years. This level of compliance essential takes the current available curatorial work time. This
is exemplary compliance but means additional collection-records needs require more staff, as the inclusion of herbaceous records, beginning to manage records from new garden typologies, etc.

- As part of prioritizing and justifying the curatorial staffing needs, we suggest creating ongoing, 2-3 year rolling plant records and collection management goals and objectives

The percent of the collections and the completeness of the records is exemplary. Accuracy that have been mapped: 75% of the collection has been inventoried within the last 10 years (via self-study).

The number of display labels on grounds is exceptional level of excellence for display labels already achieved for the woody plants. Implementing the master plan requires incorporating in the herbaceous materials, too.

Currently, UDBG has the advantage of having a plant records intern on staff with substantial field experience and proficiency with BGBase/BGMap. However the level of experience for incoming interns can be variable. There are numerous challenges in using 1-2 year interns and while trying to maintain consistency and accuracy in the day-to-day work of plant records.

Written records still on file exist and are occasionally referenced. These should be digitally duplicated and included in UDel archive systems as part of risk management of institutional history and records.

Dr. Frett noted the possibility of submitting an application for UDBG’s Styrax collection for American Public Gardens Association Plant Collection Network status which the reviewers encourage.

**Labeling**

Accession and display labels are located on the north side of woody plants. Both labels are engraved
plastic attached via coated wire. Labels are readable and contain scientific name, common name and family. Approximately 80% of the labels could be found during a casual search by the reviewers. Reviewers agreed that the garden is exceptionally well-labeled.

On trees, accession and display labels were drilled into the trunk at or near breast height. Shrub labels are attached to a suitable branch. The Garden’s self-study noted that shrub labels can sometimes get lost during rejuvenation pruning and other collection management activities.

Label Color Coding – should be explained to public as it is not intuitive for novice visitors. This can be accomplished with well-placed signs throughout the gardens.

- Yellow – accession
- Black/green- display labels
- Red – Delaware Nursery Landscape Association Plant of the Year

Collections Management

As with Plant Records functions, Collection Management occasionally sees a lack of continuity in work due to the use of year to year interns. 2017 is an exception as current collection manager, Andrew, is in his second year. We suggest several documents to help increase efficiency through the transitions.

- Create long term collection goals and objectives as the fundamental step to a Collections Management Policy that is needed in the AAM Core
**Documents Verification.** Update progress at year end and compile notes for next incoming intern.

It may help to use simple analysis, as a series of pie charts from plant records but manipulate in Excel: genera held as % desired; lists of missing genera and the priority to acquire which and why; % of plants that have been at some level verified vs not reviewed, etc.

- Develop a collection emergency response plan.

Discuss with UD risk management re: likely emergencies including proximity to major industrial railroad and accidents, hurricanes, calamitous loss of water for an indefinite period, etc. The focus is to prioritize the collection review and salvage when time (and staff) may be extremely limited.

- Develop an evaluation process for in-the-field, plant-specific evaluation Include standards of poor aesthetic performance as a component of removal decisions. Removing specimens that are not working as instructional materials will free resources.

- Develop a process for in-field observation/recording of missing/present accession tags or display labels.

If a unit of UD has an Information Systems program, developing a simple system could be a class/intern project and ties with the educational mission in a novel way.

**Administration**

The reviewers met and spent time with current administrative staff: Dr. John Frett, Executive Director; Valann Budischak, Volunteer, Education, Special Events; Melinda Zoehr, Donor Relations, Membership, Horticulture. Students Catherine Meholic, MS Graduate Student, Curator and Andrew Adams, Summer Horticultural Manager are part of up to 6 interns who perform the bulk of the plant records and garden management and were
included in the site meetings. In addition, Dr. Robert Lyons, Interim Chair, UD Plant and Soil Science Department provided helpful context and on-site perspective as requested.

A 13-person advisory committee comprised of industry representatives, University faculty and a Friend’s representative provide guidance to the garden.

The reviewers were impressed with the staff’s individual and collective expertise, experience, and ties within the university, industry, and public support audiences.

**Equipment storage building is inadequate**

The Administration is ultimately responsible for the facilities, infrastructure, and public safety. The safety issues of note are: 1) the unsalvageable condition of some storage and equipment structures, and 2) some of the larger trees near pathways in need of maintenance pruning given their crown damage. These two issues need to be resolved for compliance with the ‘Facilities and Risk Management’ component of the *Characteristics of Excellence*.

**Website**

The UDBG website [http://ag.udel.edu/udbg/index.htm](http://ag.udel.edu/udbg/index.htm) serves as a base introduction to the garden and includes useful information on the garden’s history, purpose, gardens, collections and upcoming events. The website is well done, easy to navigate and contains a tremendous amount of information regarding the collections.

An interactive map of the grounds is available and a PDF color map can be easily printed. A Gardens & Plants Tab links you to engaging photos and information about the gardens and the plant collection. Each of the garden links provides information about that garden as well as several of the notable plants that can be found there.
The website also provides links to maps of Hollies, magnolias, maples, oaks and viburnums. These links include satellite maps that mark locations of individual species throughout the garden.

The website also contains information regarding specific genera in the collections. The collection is well represented and includes photos, cultural information and other technical and non-technical information. This information is not only useful to students in plant sciences but also to professionals and home gardeners.

An up-to-date and complete plant inventory is available online. The inventory includes a spreadsheet that includes accession number (first two digits are the year the plant was accessioned into the garden), scientific name, garden location (indicated by the bed code in the garden), common name, and plant family. A grid map with garden areas is also online making finding these plants on grounds rather simple.

**Recommendations**

Key considerations are listed with each Recommendation.

1. **Raise the awareness of the garden’s value both internally and externally (two elements listed)**

   **A. Greater ties within the University**

   The garden currently supports over 40 courses on campus. Initiate an instructor survey to better understand this use. Consider reconvening the Master Plan committee to help build awareness of the garden’s value to key stakeholders. A conceptual program plan could be created that helps develop and maintain the garden’s academic and research connections across related disciplines as organic farming/gardening, entomology, bio/agricultural and
sustainable systems engineering, scientific writing for public audiences (as tied intern projects), etc. Explore the use of the gardens as a Marketing tool for the University.

B. Greater ties with the community

Further build connectivity with the public by initiating targeted visitor centric projects. While the Master plan addresses this on a large scale, there are several smaller projects that can be implemented now and with minimal resources. Consider a marked suggested walking trail beginning at the Creamery; add several interpretation signs about key concepts and plants that relate to the CANR mission throughout the garden; initiate additional public programs such as scheduled staff or volunteer-led walking tours, ongoing lectures, etc.

The master plan will also expand the mission to encourage greater interaction with the public. This will necessitate a change in the interpretation of the collections so general public will appreciate the collection for the multiple roles it will serve. Until then, the garden currently offers plenty of opportunities to connect with visitors that could be promoted.

Build external awareness, as through:

- Master Gardener education/training/and deeper links with extension;
- Public education programs with non-profit societies as partners;
- Ice Cream walks that take advantage of the Creamery audiences;
- Forge even deeper ties with the Delaware Nursery Landscape Association. The DNLA currently holds an Industry Day at the Gardens. Programs such as this demonstrate the potential to develop further collaborations with other members of the green industry such as the state arboriculture chapter.
2. **Improve the momentum and continuity of work accomplished by garden staff, including seasonal internship.**
The growth of the garden and its collection in order to serve CANR is beginning to outpace the ability to adequately staff the garden. Consideration should be given to developing a staffing plan to prioritize and recommend any expanded staffing, including the strategic (not just operational) role of internships. At present several key roles (as curator) are filled by a chain of internships, leading to both recurrent learning-curve inefficiencies and loss of institutional memory. Plan for core staffing that interns supplement while learning professional practices.

3. **Communicate the limitations of staffing by developing detailed and focused collection management tied to staffing levels**
Especially in moving toward a master plan this may require a reprioritization of the primary collections (including tracking of perennials) or for select removals of current acquisitions to accommodate plan components. Benchmark with similar sized gardens. Prioritize and develop a budget for full-time staff positions. Tie these positions in with the broader collections strategy and plan and phased ability to increase the work load.

Develop a **collection management plan**, a *Core Document*, to guide ongoing work on the grounds, including written plant evaluation criteria and procedures that include aesthetic criteria.

4. **Review Collection Policy and update as needed**
Strive to grow collections in conjunction with broader and targeted CANR and public audience development. While still maintaining the garden’s core educational purposes, consider elements and components that would assist with and support building broader citizen and industry support.

Participate in operational benchmarking with similar-sized gardens through American Public Gardens Association (APGA).
5. Submit the gardens collection of *Styrax* for inclusion in the Plant Collections Network
Add further recognition to the collections by evaluating the possibility of submitting *Styrax* to the Plant Collections Network (PCN). The PCN allows gardens to gain national visibility among peer institutions, participate in PCN-restricted germplasm sharing and conservation, and receive public recognition as part of this NGO-USDA collaborative project to protect and develop our Nation’s genomic heritage of native and domesticated plants. Grants are regularly available through APGA to assist with evaluation.

6. Seek ArbNet Accreditation
Although the garden is technically a botanic garden, the collection and the level of records are quite suitable for recognition through ArbNet accreditation. The program is administered by the Morton Arboretum and provides varying levels of recognition to for excellence in woody plant collections.

7. Estimate Master Plan garden staffing and collection management impacts
This is a ‘big picture and down’ view of staffing needs and collection impacts that is quite different from the ‘where we are today’ perspective of Recommendation 3. Recommendation 7 becomes the target and the plan from Recommendation 3 is the reality-based foundation. The two are intentionally addressed separately so that current operational capacity is maintained and incrementally increased while the target evolves and comes into focus.

8. *Initiate Bold Success!* Divide and conquer College Ave plantings to herald progress guided by the Master Plan
This can become a 2018-based project with a time-line from there; its listing here is for clarity for the first bold step to be taken. That should be sooner than later.
Summary

The reviewers are impressed with the Garden’s ongoing commitment to creating and managing a diverse, well-documented plant collection that has served students and faculty of the University well. As a living laboratory to support plant science, the collection demonstrates the Garden’s commitment to education.

With limited staffing and a heavy reliance on seasonal interns, Dr. Frett has instilled in all staff that we spoke with passion and commitment to the mission and work of the Garden. Given the inherent turnover with interns, the plant collection has been very well cared for.

As we face climate change, urbanization and the threat of invasive plants and pests, the role and extent of the plant collection will need to broaden as we strive to better understand ecosystems and plant communities and their role in our well-being. This provides tremendous opportunity for the Garden to deepen existing connections with the garden both within the University and within the community.

The Garden continues to build its outreach to casual visitors and the community. We encourage the Garden to build this even more, both in educating the community and to expand Garden support. It is noted that the Master Plan committee placed this as a high priority objective and we believe the plan has the potential to serve this well.

The intent of the Recommendations is to document, expand, and celebrate the relevance of the gardens and collections not only to CANR, but to the citizens of Delaware. Working through the Recommendations is expected to assist the Gardens in realizing the objectives of the AMA Characteristics of Excellence, and encourage review of Garden operations from the perspectives of public trust and accountability; mission and planning; leadership and organizational structure; collections stewardship; education and interpretation; financial
stability, and; facilities and risk management. Given the current structure and context of the Gardens, we have intentionally focused the main Recommendations as a series of points seemingly independent but actually functionally integrated with the Characteristics of Excellence.

1. Raise the awareness of the garden’s value both internally and externally (Two elements listed in detailed section)
2. Improve the momentum and continuity of work accomplished by garden staff, especially through seasonal internships
3. Communicate the limitations of staffing by developing detailed and focused collection management tied to staffing levels
4. Review Collection Policy and update as needed
5. Submit the gardens collection of Styrax for inclusion in the Plant Collections Network
6. Seek ArbNet Accreditation
7. Estimate Master Plan garden staffing and collection management impacts
8. Initiate Bold Success! Divide and conquer College Ave plantings to herald progress guided by the Master Plan
Resources


AAM Museum Junction Online Forum for Museum Professionals:
http://community.aam-us.org/home

AAM Information Center:  http://www.aam-us.org/resources/information-center


American Public Gardens Association (APGA)
http://www.publicgardens.org/
About the Plant Collections Network | American Public Gardens Association


http://www.bgci.org/resources/Living_collections/

Morris Arboretum of the University of Pennsylvania,
http://www.business-services.upenn.edu/arboretum/gardens_collection.shtml


http://ag.udel.edu/udbg/visitors/aboutus.html

Stanley Smith Horticulture Trust
http://www.adminitrustllc.com/stanley-smith-horticultural-trust/ is a perfect fit for some current priority funding needs of the Garden. Grants of up to $20K are routinely funded for one-year projects. The Trust is restricted to “ornamental horticulture”. Both reviewers have written successful proposals for their institutions and are willing to help guide proposal development.


UDBG MAP Visit Schedule

MAP Review team:

Dr. David Michener  Luke Messinger
Associate Curator  Executive Director
Matthaei Botanical Garden & Nichols  The Dawes Arboretum
Arboretum, University of Michigan

Tuesday 25 July

12:00 noon                    Team arrives, tours gardens
2:00 – 3:00 PM               Meet with John Frett

Wednesday 26 July

8:00 – 8:30 AM               Staff meet with Review team, light breakfast
                               available
8:30 – 10:00 AM              Meet with Valann Budischak (Volunteer,
                               Education, Special Events)
10:00 – 11:30 AM             Meet with Melinda Zohrer (Donor Relations,
                               Membership, Horticulture)
11:30 – 1:00 PM              Lunch
1:00 – 2:30 PM               Meet with Catherine Meholic (MS Graduate
                               Student, Curator)
2:30 – 4:00 PM               Meet with Andrew Adams (Summer
                               Horticultural Manager)
6:00 PM  Dinner with Dr. Robert Lyons, Interim Chair, Plant and Soil Science Department, Chair UDBG Committee

Thursday 27 July

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 – 10:00 AM</td>
<td>Review records, labeling (Cat Meholic)</td>
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<tr>
<td>10:00 – noon</td>
<td>Tour nursery/greenhouse/trials</td>
</tr>
<tr>
<td>1:00 – 1:30 PM</td>
<td>Lunch</td>
</tr>
<tr>
<td>1:30 – 3:00 PM</td>
<td>Review maintenance (Andrew Adams)</td>
</tr>
<tr>
<td>3:00 – 4:00 PM</td>
<td>Exit interview with John Frett</td>
</tr>
<tr>
<td>6:00 PM</td>
<td>Dinner</td>
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Perceptions of Collections Activity (From self-study)

The understanding of the collections varies widely with the group questioned. Board members generally have a lesser knowledge of the detailed content of the collections but have a reasonable understanding of the collections value to the educational mission. Most are committed to the garden for its intimate relation to the education of students at the University of Delaware. As for staff, there is a much greater knowledge of the contents of the garden and a deeper appreciation for the value. Most staff are part time, student interns, the very group the garden serves. Because of this dual role, the interns appreciate the garden from both the care takers’ and recipients’ viewpoints. This inspires them to be dedicated employees that truly understand the value of their efforts. Since the garden is embedded in the academic environment, all staff appreciate the value of the collection to the mission of the garden.

The staff does not always appreciate the impact of their work on the record keeping responsibilities of the curator. Staff tend to focus on their immediate task and do not consider the impact on other in the institution. The most common issue is the loss of accession tags on plants in the collection. This occurs due to reasons beyond our control (mainly vandalism) but also occurs unintentionally when plants are pruned and the branch with the accession tag is removed. Maintenance staff are educated to always check for the location of the tag before pruning a plant but sometimes get focused on the immediate task they forget about the tag. I do believe this is minimal since the student interns responsible for maintenance are also the students that often use the tags while studying. The accession records contain map locations for the plants in the collection so if labels are lost, plants can be identified and tags replaced.

I do not believe that the board or staff have misperceptions regarding the collections. The mission is clear and obvious based on the environment, a collection of plants in a botanic garden that primarily serves the education needs of the students. The completion of the master plan will expand mission to encourage greater interaction with the public. This will necessitate a change in the interpretation of the collections so general public will appreciate the collection for the multiple roles it will serve.
Collections Policy

MISSION STATEMENT
The mission of the UDBG is to contribute to an understanding of the changing relationships between plants and people through education, research, extension and community support so as to instill an appreciation of plants in the landscape and the natural environment.

Education is a critical part of the mission of UD Botanic Gardens. UD Botanic Gardens is a research center, a laboratory, and a classroom in which studies in plant biology, botany, plant pathology, landscape design, horticulture, entomology and wildlife ecology are pursued through experiential learning. It also maintains a diverse and dynamic living plant collection that stimulates and engages, with more than 3,000 species and cultivars of perennials, shrubs, and trees. We work hard to promote an understanding and appreciation of plants in the landscape and natural environment.

SCOPE OF THE LIVING COLLECTIONS
The underlying intent of the plant collection in the UDBG is diversity. The distinction of the collection will establish a niche for the garden when compared to other regional gardens. Whenever adding plants to the collection, extraordinary effort should be exerted to expand the diversity of plants in the overall collection and repetition of existing plants should be minimized. While cultivars will always be a major component of the collection, when possible, species should be represented and documented, wild collected material given the highest priority. The collection not only provides representative plants for study or to create landscapes and habitats, but it also serves as a genetic resource for potential research and conservation. This material is valuable not only to the University of Delaware but also to institutions across the country and should be shared freely when possible.

Additionally, the general availability of the plant in the nursery trade should be considered when adding plants to the collection with emphasis given to plants not well represented in the regional trade or other public gardens. Additions to the collections should enhance not only the diversity in the UDBG but enhance the diversity of plants represented in the region and nationally when possible. This diversity will define the collections and enhance the institution. Particular emphasis is placed on the following genera (listed in alphabetical order):
Acer
Baptisia
Calycanthus
Camellia
Carpinus
Corylopsis
Crataegus
Hydrangea
Ilex
Ita
Magnolia
Mahonia
Osmanthus
Pinus
Quercus
Styrax
Viburnum
Genera in the Hamamelidaceae are also a group to emphasize

Efforts should be made to incorporate these and other core collections into the National Plant Collection Program administered by the American Public Gardens Association.

ACQUISITION OF PLANT MATERIAL

Acquisition Guidelines, Selection Criteria, Modes of Acquisition (field collections, purchases, gifts, exchanges)

The collections policy for the UDBG must be consistent with its goals as stated in the mission statement. The UDBG plant curator will accession all plants added to the UDBG upon approval of the director. The staff member obtaining the plant for addition to the collection must provide all pertinent accession information for the curator to accession the plants. The curator will verify all nomenclature prior to accessioning.

Plants will be acquired based on the goals of the UDBG. Primary emphasis will be given to teaching needs. Any plants, or collections of plants necessary for the teaching of undergraduate and graduate course in the Department of Plant and Soil Sciences will be acquired based on the requests of instructors. Instructors in other departments within the College of Agriculture and Natural Resources (CANR) may also request that plant be acquired but priority will be given to those from the Department of Plant and Soil Sciences.

Any plants necessary for research needs may be acquired by the researcher and accessioned into a garden to maintain a stock or type plant for the purpose of the research
project. Multiple plants of the same taxon will not necessarily be maintained in the
garden. Independent test plots should be established for the purpose of the research
project proper. These test plots may be located in one of the gardens of the UDBG if it is
deemed appropriate by the UDBG Director. The test plots should be considered
temporary in nature lasting for the duration of the project. All such plots must be
maintained, by the researcher, to the standards established by the UDBG Director. If
plots are not maintained the researcher will be notified and plots could be removed if not
maintained.

Any plants necessary for community support will be acquired and accessioned into the
garden based on a request faculty or extension staff in the College of Agriculture and
Natural Resources, based on space and resource availability. This request may be on the
behalf of an individual, such as a faculty member from the college, or a group outside of
the committee, such as the Delaware Landscape and Nursery Association. This
acquisition may be for the purpose of promoting a plant, storing needed germplasm,
acquiring stock for propagation, etc.

All requisitions will be given to the UDBG director for purchase and information
forwarded to the curator to be accessioned, if funds and space are available.

Plant Gifts - only unrestricted gifts may be accepted.

Add- Memorial plant policy?

**ALL PLANTS MUST HAVE A DEFINED SOURCE**

- Plants that are to go into our collections must have a defined source, either a nursery, a
garden, a collector who collects wild material, a donation, or a lineage of an accessioned
plant, in the case of propagules.
- A mystery plant with an unknown source will not be accession and discarded or given away.

**Collections Documentation**

The University of Delaware Botanic Garden, like any other botanic garden, is a
repository of botanical collections that supports the mission statement of the institution
(See Mission Statement). It is imperative that these collections be documented. UDBG
has an official Collections Policy that should be followed at all times, (See Collections
Policy). But what happens after a plant is brought into the garden following the
Collections Policy? If the proper plant documentation is not recorded as soon as
possible, this information is lost and the plant is no longer worthy of the collection. The
value of the collection is compromised if it is not properly documented in an organized
fashion, following a defined protocol. This document outlines a protocol for
accessioning plants.
All woody plants are to be accessioned into the collection. Other accessions are left to the discretion of the UDBG Director. 
It is the responsibility of the Curatorial Graduate Student to maintain the accession records in BG-BASE and BG-Map.

Accessioning

Plants that follow the Collections Scope, are considered for inclusion into the UDBG. All plants are accessioned as soon as possible, so the staff can follow their location, whether they are planted directly, or are kept in the greenhouse area.

When a plant is first received, it is assigned an accession number and logged into the Accession Log Book, located in the UDBG office. Newly designated accession numbers will then be entered into BG-BASE, with the associated information, source, received date, size, etc.

After the accession and plant records are created in BG-Base accession tag information will be recorded on the "Accession Label Request Forms" and yellow accession tags will be engraved and placed on the plant, before it leaves the padwall area in Fischer Greenhouse.

Plants with accession tags will most likely be held until planting in the Fischer Greenhouse Complex, the old greenhouse, or the supporting plastic houses to the south. A designated bench, depending on space, will most likely hold these plants.

Under no circumstances will a plant be planted out in the garden without a yellow accession tag and a record in BG-BASE. The Curatorial Graduate Student must be notified of any new additions to the garden.

Initially each plant's original location will be where it was placed after coming in (example Old Greenhouse Room 4), this will be updated with the most current location after planting.

All plants planted into the gardens will be located with the GPS unit and entered into BG-Map ideally on a monthly, but minimally quarterly schedule.

**Accessioning a New Plant**

**Curatorial Records**

The curatorial records for the UDBG will be maintained in BG-base plant data base by the UDBG Coordinator. All woody plants will be accessioned. At a minimum, the scientific and common names, date of acquisition, source, accession number and location in the garden will be recorded. If additional information such as nativity, plant size, contact person at the nursery, etc. is available it will be recorded based on the fields within BG-base. The accession will be composed of 1) the last two digits of the year in
which the plant was accessioned, 2) a number representing the chronological order of that particular purchase within the year specified, and 3) a number ranging from 1 to the number of specimens of that particular taxon accessioned from that acquisition, specific to each plant.

Example: 3 Acer rubrum ‘Red Sunset’, 3 Acer rubrum ‘October Glory’, 5 Acer rubrum, 12 Clethra alnifolia, and 1 Viburnum sieboldii from nursery X and 5 Acer rubrum from nursery Y arrive on the 5 March 1996 and there have been 17 plants acquired to date in 1996, the accession numbers for these plants would be:

For those from Nursery X
5 Acer rubrum
3 Acer rubrum ‘Red Sunset’
3 Acer rubrum ‘October Glory’
12 Clethra alnifolia
1 Viburnum sieboldii
6-17-1 through 6-17-5
6-18-1 through 6-18-3
6-19-1 through 6-19-3
6-20-1 through 6-20-12
6-21-1

For those from Nursery Y
5 Acer rubrum
6-22-1 through 6-22-5

All plants will have 2 labels, display label and accession label. The accession label will be a 3.5 x 1.25” yellow, plastic engraved label including the scientific name, variety/cultivar (if appropriate), family, and accession number. The label will be attached to plants when the plant is received (if the plant is obtained from an outside source) or when UDBG propagated plants are potted into a 1 gallon or larger container. The display label will be a 3 x 5” engraved plastic label, either green for plants native to the eastern United States (east of the Mississippi) or black for all other plants. This label will include scientific name, variety/cultivar (if appropriate), common name, common name for the family, and source where the UDBG obtained the plant. Nomenclature will follow M. A. Dirr, Manual of Woody Landscape Plants, when appropriate, for the purpose of consistency with the plant materials courses. Other sources will also be considered (see attached bibliography).

Plant records for plants that are removed (deaccessioned) will be placed in an inactive file but the information will be maintained on that particular plant for future reference. Plant accession records will not be disposed even if the plant is no longer in the collection.

**DEACCESSIONING AND REMOVAL**

All plants in the UDBG are subject to removal if they are no longer deemed necessary to fulfill a goal of the UDBG. This decision will be made in consultation with the instructor or researcher who initially made the request to obtain the plant(s) and the UDBG director. In addition, plants in poor health, diseased or dead may be slated for removal by the UDBG director after consulting with the individual who initially requested the plant.
PROPAGULE DISSEMINATION POLICY

Any individual or organization that would like to secure propagation material for personal or commercial use should make a written request to either the UDBG Director prior to collecting material. This is not to deter the use of the collection but to document its use. We also ask that the collection of the material be coordinated so that either the UDBG Coordinator or Superintendent can accompany the individual to assure that plants are not abused. We believe that the UDBG can provide a useful service to the nursery industry and other horticultural groups by providing propagules. It also is imperative to document these activities and to assure that the plants are not destroyed in the process. The UDBG will not provide vegetative propagation material of patented or trade-marked plants. Any costs associated with the collection of propagation material will be passed on to the requestor.

INVENTORY PROCEDURES

Inventories will be done as resources permit. At a minimum, each garden should be inventoried every 5 years or when a major renovation to the garden occurs. Accession records and maps should be updated whenever plants are added or removed from the garden.

REFERENCE LIST


Characteristics of Excellence for Museums

1. PUBLIC TRUST & ACCOUNTABILITY
1.1 The museum is a good steward of its resources held in the public trust.
1.2 The museum identifies the communities it serves, and makes appropriate decisions in how it serves them.
1.3 Regardless of its self-identified communities, the museum strives to be a good neighbor in its geographic area.
1.4 The museum strives to be inclusive and offers opportunities for diverse participation.
1.5 The museum asserts its public service role and places education at the center of that role.
1.6 The museum demonstrates a commitment to providing the public with physical and intellectual access to the museum and its resources.
1.7 The museum is committed to public accountability and is transparent in its mission and its operations.
1.8 The museum complies with local, state, and federal laws, codes, and regulations applicable to its facilities, operations, and administration.

2. MISSION & PLANNING
2.1 The museum has a clear understanding of its mission and communicates why it exists and who benefits as a result of its efforts.
2.2 All aspects of the museum’s operations are integrated and focused on meeting its mission.
2.3 The museum’s governing authority and staff think and act strategically to acquire, develop, and allocate resources to advance the mission of the museum.
2.4 The museum engages in ongoing and reflective institutional planning that includes involvement of its audiences and community.
2.5 The museum establishes measures of success and uses them to evaluate and adjust its activities.

3. LEADERSHIP & ORGANIZATIONAL STRUCTURE
3.1 The governance, staff, and volunteer structures and processes effectively advance the museum’s mission.
3.2 The governing authority, staff, and volunteers have a clear and shared understanding of their roles and responsibilities.
3.3 The governing authority, staff, and volunteers legally, ethically, and effectively carry out their responsibilities.
3.4 The composition, qualifications, and diversity of the museum’s leadership, staff, and volunteers enable it to carry out the museum’s mission and goals.
3.5 There is a clear and formal division of responsibilities between the governing authority and any group that supports the museum, whether separately incorporated or operating within the museum or its parent organization.

4. COLLECTIONS STEWARDSHIP
4.1 The museum owns, exhibits, or uses collections that are appropriate to its mission.
4.2 The museum legally, ethically, and effectively manages, documents, cares for, and uses the collections.
4.3 The museum’s collections-related research is conducted according to appropriate scholarly standards.
4.4 The museum strategically plans for the use and development of its collections.
4.5 Guided by its mission, the museum provides public access to its collections while ensuring their preservation.

5. EDUCATION & INTERPRETATION
5.1 The museum clearly states its overall educational goals, philosophy, and messages, and demonstrates that its activities are in alignment with them.
5.2 The museum understands the characteristics and needs of its existing and potential audiences and uses this understanding to inform its interpretation.
5.3 The museum’s interpretive content is based on appropriate research.
5.4 Museums conducting primary research do so according to scholarly standards.
5.5 The museum uses techniques, technologies, and methods appropriate to its educational goals, content, audiences, and resources.
5.6 The museum presents accurate and appropriate content for each of its audiences.
5.7 The museum demonstrates consistent high quality in its interpretive activities.
5.8 The museum assesses the effectiveness of its interpretive activities and uses those results to plan and improve its activities.

6. FINANCIAL STABILITY
6.1 The museum legally, ethically, and responsibly acquires, manages, and allocates its financial resources in a way that advances its mission.
6.2 The museum operates in a fiscally responsible manner that promotes its long-term sustainability.

7. FACILITIES & RISK MANAGEMENT
7.1 The museum allocates its space and uses its facilities to meet the needs of the collections, audience, and staff.
7.2 The museum has appropriate measures to ensure the safety and security of people, its collections and/or objects, and the facilities it owns or uses.
7.3 The museum has an effective program for the care and long-term maintenance of its facilities.
7.4 The museum is clean and well-maintained, and provides for the visitors’ needs.
7.5 The museum takes appropriate measures to protect itself against potential risk and loss.
Characteristics of Excellence for Museums
In Plain English

Public Trust & Accountability
» Be good
» No really—not only be legal, but be ethical
» Show everyone how good and ethical you are
» (don’t wait for them to ask)
» Do good for people
» Know which people
» And to be on the safe side
» Be nice to everyone else, too
» Especially if they live next door
» Avoid cloning
» Look something like the people you are doing good for
» And maybe a bit like your neighbors
» Let other people help decide what games to play
» And what the rules are
» Share your toys

Mission and Planning
» Know what you want to do
» And why it makes a difference to anyone
» Then put it in writing
» Stick to it
» Decide what you want to do next
» When you are deciding what to do, ask lots of people
» for their opinion
» Put it in writing
» Then do it
» If it didn’t work, don’t do it again
» If it did work, do

Leadership and Organizational Structure
» Make sure everyone is clear about who is doing what
» The board knows it is governing
» The director knows she is directing (and the board
» knows it too)
» The staff know they are doing everything else
» And have it in writing

Collections Stewardship
» Know what stuff you have
» Know what stuff you need
» Know where it is
» Take good care of it
» Make sure someone gets some good out of it
» Especially people you care about
» And your neighbors

Education and Interpretation
» Know who you are talking to
» Ask them what they want to know
» Know what you want to say
» (and what you are talking about)
» Use appropriate language (or images, or music)
» Make sure people understood you
» And ask them if they liked it
» If not, change it

Financial Stability
» Put your money where your mission is
» Is it enough money?
» Will it be there next year, too?
» Know when you will need more $
» Know where you are going to get it from
» Don’t diddle the books

Facilities and Risk Management
» Don’t crowd people
» Or things
» Make it safe to visit your museum
» Or work there
» Keep it clean
» Keep the toilet paper stocked
» And if all else fails, know where the exit is
» (and make sure it is clearly marked)