

**PRESERVING HORTICULTURAL HERITAGE:  
PLANNED DISTRIBUTION OF PLANT COLLECTIONS FROM  
PUBLIC HORTICULTURE INSTITUTIONS**

by

Lindsey K. Kerr

A thesis submitted to the Faculty of the University of Delaware in partial  
fulfillment of the requirements for the degree of Master of Science in Public Horticulture

Summer 2014

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## **ACKNOWLEDGMENTS**

I owe a debt of gratitude to all individuals and organizations who contributed to this thesis. To Dr. Robert E. Lyons, committee chair, and Dr. David C. Michener and Rosemary T. Krill, committee members, thank you for your assistance and guidance throughout the thesis research and writing process. To the numerous organizations, survey participants, and interview subjects, thank you for your time and for sharing your knowledge and experiences. To the University of Delaware and Longwood Gardens, thank you for the unique and life-changing opportunity to participate in the Longwood Graduate Program in Public Horticulture. To my classmates Joshua Darfler, Ling Chunying, and Laurie Metzger Petrausch, thank you for your help and encouragement.

Last but not least, to my parents, Robert and Connie Kerr, thank you for your continual support and help along the way. This one's for you, dad!

## TABLE OF CONTENTS

ABSTRACT.....	vii
Chapter	
1 INTRODUCTION .....	1
2 LITERATURE REVIEW .....	5
Ornamental Flora Preservation .....	5
Collections Management .....	9
3 MATERIALS AND METHODS.....	11
Institutional Review Board .....	11
Quantitative Data .....	11
Survey 1: Botanical Gardens and Arboreta .....	12
Survey 2: Cultural Institutions and Other Non-profits .....	13
Qualitative Data .....	13
Interview Subject Selection: Botanical Gardens and Arboreta.....	14
Interview Subject Selection: Cultural Institutions and Other Non-profits.....	14
Interview Subject Selection: Plant Conservation Experts .....	15
4 RESULTS .....	16
Survey I: Botanic Gardens and Arboreta .....	16
Background Data .....	16
Plant Distribution Programs.....	18
Survey II: Cultural Institutions and Other Non-profits.....	20
Background Data .....	20
Plant Distribution Programs.....	21
Interviews.....	23
Interviews with Public Horticulture Professionals .....	24
Mary Hirshfeld. Cornell Plantations. ....	24

Dr. David Michener. Matthaei Botanical Gardens and Nichols Arboretum at the University of Michigan.....	26
Aaron Steil. Reiman Gardens at Iowa State University.....	28
Boyce Tankersley. Chicago Botanic Garden. ....	31
Interviews with Cultural Institutions and Non-profit Professionals .....	33
Kyle Cheesborough. Bellefontaine Cemetery and Arboretum. ....	33
Linda Eirhart. Winterthur Museum, Garden and Library .....	35
Cathy Fields. Litchfield Historical Society.....	37
Anne Symmes. Beatrix Farrand Garden Association. ....	39
Interviews with Plant Conservation Experts.....	41
Pam Allenstein. North American Plant Collections Consortium.....	41
Abby Hird. Botanic Gardens Conservation International U.S.....	44
Sophie Leguil. Plant Heritage. ....	45
Dr. Margaret Pooler. US Department of Agriculture/Agricultural Research Service at the US National Arboretum (USNA). ....	49
5 DISCUSSION .....	52
Introduction.....	52
Plant Heritage.....	53
Collaborations .....	54
Case-by-case .....	57
Reaching out .....	57
Agreements .....	58
Long-term Commitment .....	62
Record Keeping .....	65
Selectivity .....	70
Recommendations.....	71
Further Research .....	71
Conclusion .....	73
REFERENCES .....	75
Appendix.....	82
A IRB DOCUMENTS .....	83
B SURVEY I RESULTS.....	88
C SURVEY II RESULTS.....	95
D LIST OF ALL INTERVIEW SUBJECTS .....	105

	Botanical Gardens and Arboreta.....	105
	Other Non-profits and Cultural Institutions.....	105
	Plant Conservation Experts.....	106
E	INTERVIEW QUESTIONS FOR BOTANIC GARDEN PROFESSIONALS .....	108
F	SUMMARIES OF INTERVIEWS WITH BOTANIC GARDEN PROFESSIONALS .....	111
	Dr. Tomasz Anisko. Longwood Gardens. ....	111
	Laura Caddy. University of Alberta Devonian Botanic Garden. ....	115
	Chris Carmichael. University of California Botanical Garden at Berkeley. ....	115
	Dr. Patrick Griffith. Montgomery Botanical Center. ....	118
	Dr. Michael Gross. Sister Mary Grace Burns Arboretum. ....	121
	Robert Mottern. Sarah P. Duke Gardens. ....	123
	Mark Richardson. Garden in the Woods.....	125
	Marita Tewes-Tyrolt. The University of Utah Red Butte Garden. ....	127
G	INTERVIEW QUESTIONS FOR NON-PROFITS AND CULTURAL INSTITUTIONS .....	130
H	SUMMARIES OF INTERVIEWS WITH NON-PROFITS AND CULTURAL INSTITUTIONS .....	134
	Eric Becker. Drayton Hall.....	134
	Stephen Bohlin. The Andrew Low House. ....	136
	Lois Cole. Historic Deepwood Estate. ....	138
	Doug Conley. Edsel and Eleanor Ford House. ....	139
	Susan Damon. The Fells Historic Estate and Gardens. ....	141
	Tyler Diehl. Ladew Topiary Gardens. ....	143
	Chuck Gleaves. Kingwood Center.....	144
	Amy Graham. Longue Vue House and Gardens. ....	146
	Krystyn Hastings-Silver. Lyndhurst. ....	147
	Tom Johnson. Magnolia Plantation and Gardens. ....	150
	Laura Roberts. Van Vleck House and Gardens. ....	153
	Tony Shahan. Newlin Grist Mill.....	156
	Quill Teal-Sullivan. Meadowburn Farm.....	158
	Chris Ward. The Trustees of Reservations. ....	160
	Rebecca Wilson. Old Swedes Church. ....	163

## **ABSTRACT**

Public gardens are important cultural institutions that often hold collections of our horticultural heritage, including plant cultivars that represent both our history and important genetic material. This study examined public horticulture institutions that curate and preserve the genetic material of cultivated ornamental plants. Institutions keeping germplasm were identified and data was collected using online surveys and interviews. Results indicated that relatively few institutions have in place programs to preserve plants and still fewer have duplicates of genetic material. Alarming, if the collections of cultivated plants are destroyed through disaster, the cultivars may become extinct and their genetic traits forever lost. Research was conducted to determine if protocols existed at North American horticultural institutions that enable the distribution or dispersal of cultivated plants to other gardens, cultural sites, and other non-profit organizations. Surveys and interviews of staff at historic sites, museums, and other non-profits, were conducted in order to determine what they need in order to feel comfortable receiving plants from a public garden as part of a long-term plant dispersal and partnership program. The research led to the development of recommendations that will facilitate the distribution of herbaceous plant material among gardens and non-profit institutions. These recommendations may help guide the creation of program to foster collaboration between botanical gardens and cultural institutions in the name of preserving ornamental flora.



## **Chapter 1**

### **INTRODUCTION**

Botanical gardens, arboreta, and other public horticulture institutions hold a unique place in society. Along with museums and other cultural institutions, they are depositories for artifacts that represent our history as well as objects that we consider beautiful and meaningful. Botanical gardens and arboreta not only have the opportunity to display live plants in unique settings and educate the public, they also frequently hold collections of significant plants. In the United States, horticultural collections include native and non-native species, historic ornamental cultivars, and contemporary selections and hybrids.

Our horticultural heritage has taken generations to develop. Between 1640 and 1940 more than 25,000 different ornamental plants, ranging from bulbs to trees, were introduced to both public and private gardens and arboreta (Adams, 2004). The vast diversity of plants came from multiple continents, as did the expanding audiences who prized them. In North America, even indigenous species were appreciated. Garden catalogs in the 1860s listed numerous horticultural selections of North American native annuals, such as *Abronia*, *Clarkia* and *Eschscholzia* (Newcomb, 1985). Since 1940, a vast number of selections of other genera have been registered in the United States (Adams, 2014).

As current natural and human-induced disasters or emergencies threaten, as financial hardships increase, and as aesthetic tastes and trends change, historic cultivars

are put at risk of disappearing through disinterest. Since the turn of the 21<sup>st</sup> century, the United States has seen multiple natural disasters that threatened or destroyed public horticulture collections. In 1992, Hurricane Andrew devastated the state of Florida and, in 2005, Hurricanes Katrina and Rita made landfall on the US Gulf Coast states, causing catastrophic damage to public and privately owned trees and gardens through high winds and flooding. In October 2007, and again in early 2014, wildfires swept through Southern California devastating parts of the region. These events have served as wake-up calls to many public horticulture institutions about the necessity of planning for natural disaster (Bergquist, 2009).

Disaster and emergency can also come to botanical gardens and arboreta by human hand. Few public horticulture institutions have the means to completely secure their borders and protect their plants from vandals and thieves. In 2009, Lake Washington Park Arboretum in Seattle, Washington, lost its extremely rare Chinese *Keteleeria evelyniana* when an unknown person cut it down, possibly for use as a Christmas tree (Wilkinson, 2009). In May 2013, police began investigating the deliberate poisoning of trees in King Park, located in Newport, Rhode Island (Putman, 2013). In June 2013, an axe was taken to the Arid Garden at the Melbourne Royal Botanic Gardens in Australia destroying 80% of the cacti and succulents (Lynch, 2013). Often sited at accessible locations and not well protected, public gardens and arboreta are at risk.

Public horticulture institutions, once the keepers of our nation's horticultural heritage, are being forced to abandon collections or to de-accession them (McCarthy, 2010; Segraves, 2011; Coleman, 2012). The 2008 recession negatively affected the financial positions of many institutions, cutting endowments and hindering donations. Consequently, many public garden staffs and programs have been downsized or eliminated (Pogrebin, 2009; Frost, 2013). Changes in leadership, and therefore

organization priorities, have also led to the destruction of living collections (BGCI, 2009; Coleman, 2012). As new developments arise, collections may become at risk of being eliminated in favor of the latest trends in public horticulture. Perhaps more significantly, as businesses and nurseries focus on selling the latest introductions to the trade, older and less popular cultivars disappear from nurseries' growing stock, making it all but impossible for replacements to be acquired for collections (Kunst, 2013). According to the United Kingdom's Royal Horticultural Society, since tracking of cultivars began in 1987, 50,000 are no longer listed and offered commercially (Seymour, 2012). Consequently, heritage plant introductions are being lost. Unless something is done, significant plant material will be unavailable for research, breeding, and/or the enjoyment and use of future generations (Given, et al, 2006; Leijenhurst, 2011; Seymour, 2012).

The declining availability of heritage cultivars calls for a closer look at current attempts by botanical gardens, arboreta, and non-profit organizations, to preserve them, and also for identifying the factors that both enhance and limit involvement. Research indicates that there is a simmering international interest in cultivar preservation, but that few institutions have undertaken concerted efforts to develop strategies to do so. The objectives of this research were to investigate current efforts to "backup" or duplicate plant collections by North American institutions, to examine plant conservation organizations outside the United States, and to determine the interest of non-profit organizations in participating in an effort to preserve cultivars of plants. This thesis examines a process of documented preservation of plants that includes multiple dispersed or duplicate plantings at selected sites, collaborations between institutions, consistent record keeping by participating institutions and organizations, and monitoring of plant material condition. Furthermore, results from this research were used to develop recommendations that may be used by public horticultural institutions seeking to

participate more fully in preservation efforts or to develop a more formalized germplasm dispersal program with other organizations.

## **Chapter 2**

### **LITERATURE REVIEW**

#### **Ornamental Flora Preservation**

Gardens and collectors in the United Kingdom have led the way in preserving garden cultivars. In May 1977, the Royal Horticultural Society (RHS) devoted its journal *The Garden* to the issue of garden and plant conservation. In 1978, a conference titled *Practical Role of Gardens in the Conservation of Rare and Threatened Plants* was held to discuss what was being done for garden and plant conservation and what still needed to be done. Out of the forum was born the National Council for the Conservation of Plants and Gardens (Plant Heritage, 2008). In April 2006, the National Council for the Conservation of Plants and Gardens (NCCPG) and RHS together hosted a conference, “Growing Heritage,” to look at plant conservation in the 21<sup>st</sup> century (Thorton-Wood, 2006). In 2009, NCCPG was renamed as Plant Heritage; it remains very active in the U.K. by aiding botanical gardens, nurseries, and private collection holders (Upson, 2013).

Demonstrating continued interest, the RHS journal, *The Plantsman*, has featured at least eight articles since 2006 about the conservation of cultivated plants. In “Challenges for the future,” Simon Thorton-Wood argued on behalf of conserving cultivated plants for “a sense of identity and a sense of place” as well as for their genetic material and potential for breeding (Thorton-Wood, 2006). Marking the 30<sup>th</sup> anniversary of the founding of Plant Heritage, “NCCPG: 30 years of plant collections” discussed priorities and challenges faced by the organization (Gunn, 2008). “Conserving hardy plants” explained the work of the Hardy Plant Society and its Conservation Scheme to

improve the availability of certain herbaceous perennials in the UK (Lakeland, 2008). Plant Heritage detailed its Threatened Plants Project and how it decides which cultivars are worth conserving in “Conserving cultivars” (Seymour, 2012). “Plant Heritage: Where has it come from and where is it going?” gives an optimistic view of the history of Plant Heritage, its initiatives, and its future (Upson, 2013).

Additional publications from the United Kingdom have contributed to the discussion about cultivated plant conservation. “Prioritization for the conservation of cultivated plants—a new approach” addresses the creation of a systematic method for evaluating which cultivars are most at risk of extinction and which merit preservation (Morris, et al, 2010). *An Assessment of the Conservation Work of Plant Heritage from an International Perspective* presents a comparative study of six collection holding organizations in six countries with similar goals. This dissertation was meant as a tool for Plant Heritage to benchmark other organizations and consider adapting policies and concepts (Morris, 2011).

German associates have been moving towards preserving more ornamental plants. A symposium addressed the conservation and sustainable use of ornamental plants. It was agreed that a relevant network needed to be created among German botanical gardens, research and teaching organizations, private companies and individuals. Hence, The Netzwerk Pflanzensammlungen (Plant Collections Network) was started under the auspices of the Deutsche Gartenbau Gesellschaft (DGG, the German Horticultural Society) and is currently an informal network of collection holders and enthusiasts, but does not yet have a system to preserve collections or cultivars (NCHNews Winter 2012/2013).

In 1989, a non-profit organization was created to conserve native and garden plants. The France-based Conservatoire des Collections Végétales Spécialisées (CCVS)

claims 300 national collections, second only to the National Collection run by Plant Heritage (Upson, 2013). The CCVS aims to “to encourage the conservation of botanical and horticultural plants, and educate the public in the importance of plant conservation and plant collections” (Conservatoire des Collections Végétales Spécialisées, 2014). The organization registers and evaluates collections held by individuals, institutions, and businesses (Conservatoire des Collections Végétales Spécialisées, 2014).

The Stichting Nationale Plantencollectie (Dutch Botanic Garden Collections Foundation) or DBGCF, was founded in 1988 and became part of the Netherlands Botanical Gardens Association in 2013. The DBGCF oversees that Nederlandse Planten Collecties (National Plant Collection or NPC), a collection of plants with scientific or cultural importance or significance to the Netherlands. It is managed and housed at different botanic gardens where the collections include both species and cultivars. Criteria for admission to the NPC include “prevention of unnecessary duplication,” but also states “a willingness to exchange plant material is assumed.” Collections may be put under the heading “collections of cultural or historical importance” (Botanische Tuinen, 2014). The NPC collections are separate and held almost exclusively by commercial nurseries as reference collections and to preserve genetic material for future breeding purposes (Planten Collecties, 2014).

The Garden Plant Conservation Association of Australia (GPCAA) has a collections scheme described as “plant collections [which] are held by home gardeners, botanic gardens, professional horticulturalists, land managers, plant collectors, garden societies or clubs and commercial nurseries” (GPCAA, 2014). Unlike Plant Heritage, GPCAA encourages members to create collections based on themes, such as time periods or medicinal uses or plant breeders, instead of solely on genus (GPCAA, 2014). GPCAA appears to be less formal and less active than other organizations.

The *New Zealand Garden Journal* published a call to arms titled, “Nationally networked plant collections are a necessity,” which advocated for “dispersed national collections that link holdings in various parts of New Zealand according to agreed criteria and standards and accepting responsibility for them and (where necessary) an ordered disposal of collections” (Given, 2006). David Sole, manager of the Botanic Gardens of Wellington, characterized the loss of horticultural diversity in New Zealand as “drastic” (Sole, 2009). However, to date it does not appear that a network for cultivated plant collections has been established in the country.

The American Public Gardens Association founded the North American Plant Collections Consortium (NAPCC) in the United States in 1995. It is the leader in the US for protocol development for living collections. NAPCC is a network of collection holding botanical gardens and arboreta with the goal of germplasm preservation. NAPCC collections include native and non-native plants and some cultivars. Through NAPCC, collaborating institutions have established multisite collections, most of which focus on—but are not limited to—biodiversity conservation of wild species. Participating institutions are encouraged to compare their collections with others to identify duplications and gaps. NAPCC applies the same approach to preserving collections of genera as it does to collections of ornamental flora (NAPCC, 2014). In recent years, the application to be included in the consortium has been modified to be more inclusive of collections of cultivars (Allenstein, 2014).

In 2009, the Institute of Museum and Library Services (IMLS) hosted “It’s Alive! Petals to Primates: Preservation Challenges of Living Collections.” The forum focused on effective curation and management of collections, protecting archival resources, funding resources, and disaster preparedness, but did not address the possible techniques for preservation of plant germplasm (Connecting to Collections program binder, 2009).



IMLS has awarded grant funds to the Zoological Society of Cincinnati to study the previous and current strategies and methods for cryopreservation as a tool for plant conservation. The study is designed to focus primarily on species (Cincinnati Zoo, 2012).

In 2008, at the behest of Magnolia Plantation and Gardens, ten public gardens and enthusiastic individuals came together to form the Great Gardens of America Preservation Alliance (GGAPA). The GGAPA is dedicated to preserving older varieties of camellias and azaleas once found in the US prior to the 20<sup>th</sup> century. GGAPA is an informal network of gardens who share specimens with each other so as to have duplicates within the network, and who support collecting trips in the US and abroad to source older cultivars (GGAPA, 2014; Johnson, 2014).

### **Collections Management**

Public gardens are considered by many to be museums of living collections (Michener, 2011). Like other museums, botanic gardens and arboreta keep track of the objects, namely plants, within their collections. Much has been written on “best practices” for curating living collections of plants, which includes collecting, tracking, and evaluating information from the collections and translating it into useful information for staff and garden guests (Michener, 2011). The American Public Gardens Association and Botanic Gardens Conservation International both provide resources to assist public horticulture institutions with collections management. Gates (2006) summarized twelve characteristics that Chicago Botanic Garden has assembled as essential to world-class living plant collections. *Curatorial Practices for Botanical Gardens* Hohn explains the basics of governing, building, documenting, and preserving collections, as well as linking collections to research and public programming. The chapter by Michener, “Collections Management,” in *Public Garden Management* (Lee and Rakow, 2011) summarizes major

issues in plant collections management and explains the fundamental tools for collections management.

Organizations and publications within the field of museum studies can be useful to those creating a program that involves collaboration or sharing of resources between institutions. The American Alliance of Museums provides guidance on curation, collection management, and loaning of resources or material. In 2004, the organization published “The AAM Guide to Collections Planning.” In Reibel’s *Registration Methods for the Small Museum* the best practices in museum registration for small institutions are detailed; “small need not mean poorly run” and “your collection is not a museum until it has an adequate registration system.” Acquisition, number, accessioning, documentation, loans, and deaccessioning, are all seen as necessary components of a museum registration system (Reibel, 2008).

### **Chapter 3**

## **MATERIALS AND METHODS**

This research followed a mixed methods approach, including both quantitative and qualitative data (Creswell, 2013). This approach was chosen in order to gather the broadest range of information possible to be used during the creation of a protocol for planned distribution of plant collections. Research included two surveys and 36 interviews. Of those interviews, 13 were conducted with staff at botanic gardens or arboreta; 19 were conducted with employees of museums, historic sites, and other cultural organizations; and four interviews were done with experts at not-for-profit public horticulture organizations.

### **Institutional Review Board**

All research methods used in the completion of this thesis followed the guidelines, regulations, and procedures set forth by Human Subjects Review Board (HSRB) at the University of Delaware, and the researcher received IRB certification (Appendix A). All questions and documents for surveys and interviews were reviewed by the HSRB and given exempt or approved status.

### **Quantitative Data**

Two surveys were conducted. Both were developed and administered using Qualtrics™, an online survey tool licensed by the University of Delaware. Survey participants were granted optional anonymity. All survey responses remain confidential

and are not connected with any names, including those who supplied personal contact information for interviews.

The Graduate Committee and IRB reviewed all survey questions and current Longwood Graduate Program students assisted in proofreading and testing the survey before it was released.

### **Survey 1: Botanical Gardens and Arboreta**

The first survey aimed to determine what botanical gardens and arboreta are doing to address the risk of loss of plant material and if they have distributed germplasm from their collection(s) in the past.

The survey was distributed to members of four of the American Public Gardens Association (APGA) online Professional Sections. Emails containing a link to the survey were distributed to members of the Professional Sections titled College & University Gardens, Plant Collections, Plant Conservation, and Small Gardens. The link could be forwarded and shared, so individuals, listservs, and other networks, outside of the Professional Sections may have received the survey link as well. Responses were recorded from July 16 to September 9, 2013.

The 24 question survey targeted professionals at botanic gardens or arboreta who make decisions regarding management of plant collections. Recipients of the email containing the survey link were asked to self-select whether the survey applied to them. Certain questions were targeted to filter responses. Participants were not required to respond to all of the questions. Consequently, fewer respondents answered all the survey questions than began it. 72 people answered the first question; however, 30 participants answered the final question. All responses are included in this analysis.

## **Survey 2: Cultural Institutions and Other Non-profits**

The goal of the second survey was to determine if cultural institutions and other non-profits are interested in receiving plants from botanical gardens and arboreta. It also sought to discover what obstacles organizations might face that could prevent them from participating in a plant preservation program.

The survey was distributed to members of Tri-State Coalition of Historic Places listserv, the Association for Living History, Farm and Agricultural Museums (ALHFAM) email discussion list, and a list of 235 people at small or historic public gardens supplied by Quill Teal-Sullivan. Because the link could be forwarded and shared, additional individuals, listservs, and other networks, may have received the survey link as well. Responses were recorded from September 10 to October 8, 2013.

The 24-question survey targeted professionals at museums, historic sites, public gardens, cemeteries, and other non-profits, who make decisions regarding management of the landscape or green spaces at or round the organization location. Survey recipients were asked to self-select whether the survey applied to them. Skip-logic was used to elicit responses. Participants were not required to respond to all of the questions. Consequently, fewer respondents answered all the survey questions than began it. One hundred ten people answered the first question; however, 80 participants answered the final question. All responses are included in this analysis.

## **Qualitative Data**

Qualitative research methods were made up of 36 interviews with professionals at botanical gardens, arboreta, museums, historic sites, small and/or historic gardens, cemeteries, and experts at plant conservation focused non-profit organizations. Interviews were conducted between March 12, 2014 and May 6, 2014.

### **Interview Subject Selection: Botanical Gardens and Arboreta**

Interview subjects were selected from respondents of the first survey who indicated that they were willing to participate in an interview about cultivar preservation and plant distribution. Potential interview subjects were contacted via email. Those that responded with interest were then interviewed over the phone or in person.

Twelve interviews were conducted by the researcher. Interview subjects were included so long as their place of employment had a plant collection. Subjects included representatives of botanical garden or arboreta that have a focus on wild collected plants or species and do not collect cultivars. Organizations selected may or may not have successful plant distribution programs. Four interviews that are representative of diverse viewpoints were included in the Results chapter of this thesis. A list of names of all interview subjects is included in the Appendix as well as summaries of all interviews conducted (Appendix F).

All interviews were digitally recorded. Interviewees were asked to digitally sign a consent form prior to interviews (Appendix E). Recordings will be destroyed at the completion of this research (July 2014).

### **Interview Subject Selection: Cultural Institutions and Other Non-profits**

Interview subjects were selected from respondents to the second survey who indicated that they were willing to be interviewed about historic plants and plant distribution programs. Potential interview subjects were contacted via email; those that responded with interest were then interviewed by phone or in person.

Nineteen interview subjects were chosen and included regardless of whether they believed their organization to be interested or capable of participating in a plant exchange program. Subjects included employees of historic sites, museums, small and/or historic gardens, historical societies that own properties, and cemeteries. All subjects were

employed by organizations that owned or leased properties that included green space. Four interviews that are representative of diverse viewpoints were included in the Results chapter of this thesis. A list of names of all interview subjects is included in the Appendix as well as summaries of all interviews conducted (Appendix H).

All interviews were digitally recorded. Interviewees were asked to digitally sign a consent form prior to interviews (Appendix G). Recordings will be destroyed at the completion of this research (July 2014).

### **Interview Subject Selection: Plant Conservation Experts**

In order to provide additional professional experience and insight to the research, four interviews were conducted with experts at plant conservation focused non-profit organizations. Subjects at plant conservation focused non-profit organizations were chosen because of their direct knowledge of the mission of their organization and of certain programmatic functions. Pam Allenstein, manager of the North American Plant Collections Consortium (NAPCC) for the American Public Gardens Association (APGA), was selected for her experience in coordinating collaboration between collection holding institutions. Dr. Margaret Pooler, research leader at the USDA U.S. National Arboretum (USNA) was interviewed because of her knowledge of the USNA plant distribution program. Abby Hird, program director for Botanic Gardens Conservation International (BGCI) U.S. was asked to speak on behalf of BGCI and its role in conserving plants. Sophie Leguil, the Threatened Plants Project Coordinator for Plant Heritage in the U.K., was chosen because of her part in compiling lists of cultivars at risk in the UK as well as her knowledge of the initiatives undertaken by Plant Heritage.

## **Chapter 4**

### **RESULTS**

#### **Survey I: Botanic Gardens and Arboreta**

Included in this section are the most salient and significant responses from the survey of APGA members. Additional data can be found in Appendix B.

##### **Background Data**

The survey began with a default description of the research project and the expressed desire to create a plant distribution program. Survey respondents were then asked if their garden holds one or more special collections of plants. Fifty-eight individuals answered “yes” and continued on to the next question. The 13 individuals who responded “no” were automatically exited from the survey. Of the remaining 58 respondents, 86% said that the plants in their special collections are accessioned. The remaining 14% do not accession plants.

Twenty-nine (49%) survey respondents work at an institution with an NAPCC collection. Conversely, thirty (51%) survey respondents work at an institution without an NAPCC collection. Of NAPCC collection holders, 89% have been a part of the consortium for more than one year. Five respondents (19%) indicated that their respective institution has had an NAPCC collection for over 10 years. These responses informed the research about the level of institutional commitment to collections and the standards at which the plant collections are held.

Asked if they have a disaster plan for their collection, 76% of all respondents indicated that they do not. The next question asked if the institution had a backup or



duplicate location of the collection. Significantly, 89% of survey respondents stated that they do not have a backup location or duplicates.

Of the six individuals who responded that they do have a backup location, five have theirs at the same site as the original collection. Three individuals responded that they have duplicate plants miles away on property owned by the same institution. Three have duplicate plants miles away on property owned by a different institution. Finally, two respondents stated that they have plant material in a tissue bank.

All survey respondents were asked if they store seeds or tissue from their plants. Fifteen individuals (28%) expressed that they store seeds or tissue from their plants. These responses informed the research about the risk of loss of plant material or collections from disaster.

To gain a deeper understanding of the collections at the institutions participating in the survey, participants were asked if their institution holds a collection of herbaceous perennials. Of the 52 respondents, 41 institutions (79%) claim collections of herbaceous perennials.

The next question asked all survey participants if they have a collection of plants that must be reproduced by cloning and/or traditional vegetative reproduction. Thirty-three respondents (63%) have a collection of perennial plants that must be reproduced by vegetative reproduction. Perennial plants that must be reproduced by cloning or vegetative reproduction may include trees and shrubs in addition to herbaceous perennials.

A third question asked all participants if their institution has a collection that includes cultivars. Ninety-two percent responded affirmatively. These questions and responses informed the research about whether institutions could potentially backup or

duplicate their collections through seed storage or if clonal material or tissue was necessary.

### Plant Distribution Programs

The majority of responding institutions have distributed specimens from their collection to another garden, arboretum, or organization, at some time. Sixty-eight percent indicated that they have distributed specimens. Skip logic was used to take the 32% who have not distributed plants to the last question of the survey.

The 36 participants who responded affirmatively were then asked to which type of garden they have sent plants. The question allowed participants to check multiple responses. Respondents could check “not sure” and/or “other” and write a response if they did not send specimens to a garden. The largest percentage of respondents (83%) indicated that they gave plant material to an APGA member site. Sixty-six percent indicated that they have given material to a non-APGA member botanical garden or arboretum. Two respondents checked “not sure” and eleven respondents checked “other” and typed written responses. The most common written responses indicated that specimens had given to universities, nurseries, and individuals. Additional written responses can be found in Appendix B.

A previous question indicated that 36 out of 53 survey takers had distributed specimens. The 17 participants who did not work for an institution that distributed plants exited the survey. The remaining 36 participants were asked if they have a program in place to distribute plants. Fifty-four percent answered that they do not have a program in place. The next question asked if their institution has a written protocol for distribution. Forty-six percent indicated that they do not have a written protocol.

Asked if they keep track of where they have sent plants, 80% responded “yes.” A follow up question asked how they keep track of specimens. Participants could check more than one answer. The majority of respondents (74%) utilize a database. Small numbers use on-site visits, photographs, and duplicate accession tags. Seven participants (23%) checked “other” and wrote responses (Appendix B).

Another question asked if participants keep track of the condition of the plants once they have reached the recipient garden. Ninety-four percent said that they do not. Out of 35 responses, only two stated that they check on the condition of the plants. A similar question asked if participants had plans to monitor plant survival rate. Again, 94% responded “no.”

The majority of those who have distributed plants have not needed to retrieve plant material. However, 15 respondents (43%) have needed to retrieve plant material. The next question asked if they were able to successfully retrieve the plant material. 14 individuals chose to respond; of those 14, 100% said they were able to retrieve plant material.

Expert verification, trusted assurance of staff horticulturist, and/or accession information, was used to determine if it was the correct plant. Eighty-six percent indicated that they used accession information to confirm plant identification. Fifty percent use experts. Forty-three percent trusted the assurance of the staff horticulturist. One respondent selected “other” and indicated that he or she used cross-listed accession numbers. No respondents utilized DNA fingerprinting. These questions and responses informed the research about whether institutions keep track of plants and how they might do so. It also gave some information as to the frequency that institutions have needed to recover plant material and if they are able to do so.

The second to last question of the survey was asked to all participants who indicated that their garden distributes plants. Twenty-five participants (83%) answered that they think their garden's program of distributing plants has been successful. Alternatively, five responded that they do not think their garden's program is successful. Respondents were given the option of leaving a comment; eleven chose to do so (Appendix B). Responses include both institutions who have and have not retrieved plant material.

All survey participants who indicated at the first survey question that their institution has special collections of plants were asked if they would be interested in participating in an interview about the topic. The final survey question provided a space for respondents to supply their contact information. Forty-nine individuals chose to do so. Their survey responses were not linked with their contact information. Some of these individuals were later contacted and participated in the interviews described later in this chapter.

### **Survey II: Cultural Institutions and Other Non-profits**

Included in this section are the most salient and significant responses from the survey of museums, historic sites, public gardens, cemeteries, and other non-profits. Additional data can be found in Appendix C.

#### **Background Data**

The survey began with a default description of the research project and the express desire to gauge the interest of a variety of institutions in historic plants in order to establish a plant distribution program. Survey respondents were then asked to if their place of employment owns the land around it. Ninety-seven individuals (89%) answered

“yes” and continued on to the next question. The 12 individuals who responded “no” were automatically exited from the survey.

Of the remaining respondents, 100% said that they grow trees, shrubs, or flowers on the property. Eighty-seven percent of organizations employ someone to care for the property. However, 52% do not have a professional horticulturist on staff. The majority, 85%, have volunteers who help care for the property. Asked if their institution keeps records of the plants on the property, 79% of respondents said “yes,” while 21% indicated that they do not keep records.

Survey participants were asked to indicate what type of institution or organization for which they work. Five options were given. Nine participants indicated they did not fit within the five options and wrote a descriptive of their organization (Appendix C). The majority, or 58%, of respondents represented historic sites. The remaining 42% of respondents worked at a diverse range of institutions, not limited to conservation organizations, history or decorative art museums, public gardens, scouts, historical societies, and living history museums and farms.

### Plant Distribution Programs

Survey participants were asked if they believed their institution would be interested in receiving plants from a botanical garden or arboretum. Seventy answered “yes,” while 25% answered “unsure.” The next question asked if they would be more likely to accept plants if they were historic, appropriate to the period of significance, or relevant to the organization’s mission. Ninety-two percent of responses were affirmative.

Several questions were asked to understand if the organizations represented by the survey participants could care for plants. Eighty-two respondents (95%) believe that someone at their organization would be able to care for plants if they were to receive

them. Those 82 respondents were then asked questions to better understand who the primary caregiver would be. Seventy two percent said the primary person would be an employee. When asked if the primary person would be a volunteer, 29% said “yes.”

Thirty-five percent of survey participants indicated that their institution would be willing to pay a nominal fee for plants. Fifty-one percent were unsure and 14% said that their institution would not pay for plants.

Asked if they would they be willing to report on the health of the plants to the donor organization, 81% of participants said yes. Four percent said “no.” Fifteen percent of participants were “unsure” if their institution would report on plant health. Participants were asked to explain why they were “unsure.” Common themes among the comments include uncertainty of amount of time involved in reporting and respondents not having the authority to make the decision. Five of the 13 respondents said their participation “depends on” certain qualifiers.

All survey respondents who answered “yes” or “unsure” if they would be willing to report on the health of the plants to the donor organization were asked two further questions. When asked how often they would be willing to report on the health of the plants, 72% said annually. Fifteen percent said every two years. Eight individuals (10%) selected “other” and chose to write a comment.

The next question asked respondents which report components they would be willing to provide on a periodic basis. Respondents could check more than one option. Of the 76 individuals who answered the question, 67 (88%) said they would report by descriptive text. Eighty-six percent said they would use photographs and 54% said they would provide an oral report by phone. Sixteen percent said they would provide drawings, sketches, or maps. Five individuals selected “other” and three wrote comments.

All survey participants were asked what types of plants they would be interested in receiving. They could select more than one answer. Herbaceous perennials received the most interest. Followed by, in order of decreasing interest, shrubs, bulbs, trees, and finally “other.” Participants who selected the “other” option were able to write in what plants were of interest to their organization.

When asked if their institution, to their knowledge, had ever received plants from a botanical garden or similar institution, 39% of respondents said “yes.” Sixty-one percent of survey takers had not received or were not aware of their institution having received plants from a botanical garden.

However, 76% said that they would be interested in participating in a program that seeks to preserve historic or heirloom plants. Two individuals (3%) said “no,” they would not be interested in heirloom or historic plants. Seventeen respondents (21%) were “unsure.” Participants who selected “no” or “unsure” were asked to write what are obstacles which prevent them from participating. Out of 16 comments, 7 mentioned staff. The most common theme among responses was lack of staff time or expertise.

Survey participants were asked if they would be interested in participating in an interview about the research topic. The final survey question provided a space for respondents to supply their contact information. Fifty-one individuals chose to do so. Their survey responses were not linked with their contact information. Some of these individuals were later contacted and participated in the interviews described in this chapter.

## **Interviews**

Included in this section are representative summaries of interviews of professionals at public horticulture institutions, museums and other cultural non-profits,

and at conservation-focused non-profits. Four interviews were chosen from each group of subjects. The interviews included in this section were chosen because they represent a variety of organizations from across the United States and the UK, a variety of institutional missions, differing opinions and experiences, and various levels of interest in preserving ornamental flora. The additional 23 summaries can be found in the Appendices.

### **Interviews with Public Horticulture Professionals**

#### **Mary Hirshfeld. Cornell Plantations.**

Mary Hirshfeld is Director of Horticulture at Cornell Plantations, owned and operated by Cornell University. It is over 4,000 acres and is made up of a botanical garden, arboretum, and nature preserves. Cornell Plantations focuses on preserving and enhancing horticultural collections and natural areas for enrichment, education, and research. Mary Hirshfeld is responsible for developing and overseeing the care of the plant collections throughout the botanical gardens and arboretum.

According to Hirshfeld, Cornell Plantations has never been focused on preservation. To serve the College of Agriculture and Life Sciences, Plantations focuses on new techniques and new plants.

Cornell Plantations has both an NAPCC oak and maple collection, including many cultivars. They have received cultivars from other NAPCC locations that are removing cultivars and trying to focus on species. However, their focus is on “turning things over.” They will replace a tree when a new cultivar is released that has similar characteristics but has surpassed it in disease resistance, hardiness, and/or form. She pointed out that it takes at least 20 years for turnover because of how slowly trees are introduced.



Plantations does not have any older varieties of herbaceous perennials. They do not replace perennials annually and do not keep older varieties because the mission of Plantations is research and education. She believes that it is important to inform the public of new introductions.

According to their plant collections policy, researchers and nurserymen have to fill out a form to collect plants. They infrequently get calls for germplasm, but they will always send them plant material if asked. They do not give to homeowners.

Sharing plants is not part of Plantations' mission. However, Hirshfeld said, "I think gardens have always been willing to share with one another." Plantations has a long history of exchanges. They get more requests from nurserymen because of the focus on cultivated plants. Nurserymen do not pay for plants, only shipping.

Plantations does not keep track of which plants they have shared or with whom they have shared plants. That information is generally not useful for Hirshfeld's purposes. She would only record information if the plant was very unusual "and I had a very small quantity and I wanted to be able to go through the records should something happen to mine and know where I could go and ask. That's the only time we'd do that."

Hirshfeld said that she has never had to ask for germplasm to be returned to her. They have been contacted by nurserymen asking for plants back when they have lost their stock plants.

Hirshfeld expressed concern about how a plant preservation program might fit into another garden's mission and collections policy. Plantations does not have anything in its collections policy that says it would hold plants to preserve them as a backup for another garden. She commented:

We all have limited space. That would be a hurdle. For us, we cannot afford the space and say we'll take 40 of your peonies and hold them in perpetuity. People might have to work through this. Where would it fit in

the mission and what would the collections policy be for that particular group of plants that you're holding for another garden.

**Dr. David Michener. Matthaei Botanical Gardens and Nichols Arboretum at the University of Michigan**

Dr. David Michener is Associate Curator at Matthaei Botanical Gardens and Nichols Arboretum at the University of Michigan (MBGNA). Since 2008, he has been involved in a multi-year effort to revitalize the historic peony garden at the Nichols Arboretum. It is the most significant collection at MBGNA and is the NAPCC herbaceous peony collection. It was given to the university in 1922 and contains 270 different cultivars and up to 800 individual plants. The interview focused on what Dr. Michener and the university are doing to safeguard the collection.

To address the risk of loss of material, MBGNA is trying to find other institutions with which they can share specimens, particularly the cultivars (the collection also contains species peonies). MBGNA has been sharing plant material with other institutions for approximately 3 years on an "opportunistic basis rather than a coherent plan." A Girl Scouts facility in western Michigan as well as a few historic sites have been the recipients of root divisions or live plants. He expressed dissatisfaction with the current process of sharing plant material.

MBGNA does not have a written plan or policy for plant distribution. A draft outline has been developed but not yet codified. Recently, a Memorandum of Understanding was signed between the Belorussian Academy of Sciences in Minsk and MBGNA to allow the two institutions to share plant material and knowledge.

Asked why they distribute the peonies, Michener explained:

So that there are redundant collections should anything happen to the ones here. We are a sitting duck for any kind of epidemic or human damage (like herbicide) and our thought is that there are probably other institutions for whom these historic peonies fit their mission and agenda and they

could be using them in their historic landscapes and gardens and it would serve their purpose. And then if something happens here, we would be able to get divisions or clones back.

He also believes that cultivars can be “an important part of our country’s cultural history and the history of what was important and why.”

They do not charge a fee to non-profits for plants or divisions. He is unsure how a fee would affect the distribution of plants, but speculates that it might be prohibitive for smaller institutions.

There is no formalized way of tracking distributed plants. A list is kept of plants sent to different sites, but the records are not in a database. The plant records system at MBGNA and all university museums is being changed to KE, a database system created for large museums. Michener believes that it will work well for keeping track of “loaned” plants. MBGNA is using the innovative technique of DNA fingerprinting “so that in the future, if we lose the plant, we can do a visual match and confirm it with a DNA fingerprint match.”

MBGNA does not keep track of the health of plants once they leave the Arboretum. Michener is concerned that “the data management would be too heavy, given how stretched we are with our own data management.” He is not sure what data is most important, who would enter it, or how it would be used. They are considering contacting institutions every 3-5 years to check on the condition of the plants and to keep the institution aware of plants received.

The most important aspect of a plant sharing or distribution program is that the plants are properly identified. Plant records are important part of ensuring success. It is “too young to tell” if the MBGNA program is successful. He has not yet had to retrieve any plants.

It is important to build a greater awareness of the plants and garden. He says, “We want to become aware of other peony gardens and link with other professionals. We don’t want to be the sole holders of things.” He would like to get more small gardens involved in order to “get the plants out there” and to “build social capital for peonies and historic plants.”

He is concerned with managing distribution. He is unsure of how to find institutions that may be interested in growing historic peonies and how to determine which plants to give them. The peonies have to meet the other organization’s mission but, at the same time, he says, “we don’t want to moth-eat the main collection by pulling off everyone’s customized set.”

To ensure the success of the peony garden and the distribution program, Michener believes it is important to raise an endowment to keep the garden staffed. He has seen too many university collections lose institutional support over time. He would like to have a part time horticulturist and part-time curator assigned to the care of the peony garden, its records, and keeping it involved with other groups.

#### **Aaron Steil. Reiman Gardens at Iowa State University.**

Aaron Steil is Manager of Public Programs at Reiman Gardens at Iowa State University. Steil is responsible for garden-wide interpretation, labeling, mapping, and management of all plant records. Steil oversees records for the Buck Rose Collection, which is a North American Plant Collections Consortium (NAPCC) accredited collection. The Buck Rose Collection is unique to NAPCC because all taxa were developed by Iowa State University professor Dr. Griffith Buck. The collection includes many of the 86 cultivars developed by Buck. The interview focused on the Buck Rose collection and what Reiman Gardens is doing to preserve the collection.

Steil said, “In terms of things we don’t know are coming, like a catastrophic weather event, something like that, we don’t have a lot in place to address what would happen to the collections.”

Reiman Gardens gives plants to other institutions, nurserymen, and individuals. There is a policy and procedure in the plant collections policy so that they know what happened to it and where it went. Anyone who takes plant material fills out a form and it is kept as part of the accession record of that plant.

For the Buck Rose Collection, the Gardens are willing to give pieces away to almost anyone who asks. They do not charge a fee. They do ask what the recipient plans to do with it. There are a lot of Buck roses that have a high potential for disappearing. Steil said, “Most of his roses, we want to distribute as much as possible so that they’re out there. And if something were to happen to our collection, we have the potential of acquiring some, if not all, of it back.” A challenge Steil faces is not knowing which Buck roses other gardens have.

Reiman Gardens has an interest in distributing the Buck roses but at this point they do not have a program in place. They have talked about establishing a program, but there are other priorities for the collection, namely rose mosaic virus testing.

The Buck roses should be preserved because they are significant to the history of Iowa State University and because they represent a gene pool that future rose breeding could build upon. Steil explained, “Many of his roses have fantastic genetics in them for the kind of things people are looking for today like disease resistance...even though that rose by itself may not be the best garden plant, it could be the parent or the source of breeding for the next, best rose.”

Reiman Gardens has a long standing relationship with one particular rose grower. After giving cuttings to the nursery, they check to see if they have been successfully

propagated. They often purchase replacement roses from him when roses at Reiman do not survive the winter. In the last few years, the nursery owner has notified them that he is going to stop growing certain Buck roses that do not sell well. Steil explained:

That's one of the dangers with the nursery industry. They do a great job of propagating and distributing material as long as it is commercially viable. If it's not very popular in terms of sales, they don't have any incentive to keep it around and they won't. Even though this nurseryman loves all of Dr. Buck's roses he has no financial reason and therefore no reason in his mind to keep some of these roses.

They have given roses to other people but not officially to serve as a backup.

Reiman Gardens has not put any Buck rose tissue in storage. They have not DNA fingerprinted the roses. All of the cultivars have been registered with the American Rose Society; there are written descriptions, and original photographs of all the plants for identification.

For the most part, the current program of giving plants to the nursery and to interested individuals has worked. They have not permanently lost any plants. Steil said he would like to make it better by "developing relationships with other folks who would be interested in having a similar collection. It would be nice to have a relationship across the country with multiple folks who can kind of serve as a resource should something happen. And it will happen. It's not if, it's when."

The most important part of creating a program is figuring out how to create relationships, so that when questions or need arise, there are resources available. He would like something to facilitate that. He would like to have a "resource of people who are willing and happy to connect with each other for any issues related to the collection."

To ensure the success of the program, there needs to be a source for verified material. Labeling and correct identification is especially important. He wants gardeners to regularly check if the plant is still alive and update the database annually.

**Boyce Tankersley. Chicago Botanic Garden.**

Boyce Tankersley is Director of Living Plant Documentation and oversees the records of over 2.5 million plants at Chicago Botanic Garden (CBG). He is part of Professional Sections at the American Public Gardens Association and serves on the North American Plant Collections Consortium (NAPCC) standing committee. He is an expert on curatorial practices at botanic gardens.

CBG gives germplasm to other gardens and institutions upon request. They use an Out of Garden Transfer form. CBG does not charge for plant material. Ninety percent plant material goes to graduate students conducting research. For-profit entities, like nurseries, are asked to pay for shipping costs.

CBG works closely with the corporate garden at the philanthropic Rice Foundation in Skokie, IL, approximately ten miles south of CBG. They almost consider it a “branch of the botanic garden.” There have been four or five situations he can think of in the last ten years where plants at CBG have died but they have been able to re-accession the plants from the Rice Foundation site.

There is not a formal, written agreement between the Rice Foundation and CBG. Tankersley explained:

The agreement is that they maintain it. They have a crew that comes in and they do the weeding and the watering and mulching and that sort of thing. And we send them staff from the garden about once a year to inventory and to produce the labels for them...From a germplasm standpoint, it has proven to be very effective creating that buffer to make sure that something that shouldn't be lost isn't lost.

CBG has exchanged germplasm with organizations to reintroduce plants back into the wild and with members of NAPCC. Some of the germplasm CBG has in the oak collection is held by other institutions. He sees the “overlap” as a “buffer.” CBG does not have a formal agreement with any other institution.

CBG has been distributing plants since soon after its founding and gives away germplasm from all collections. They send rooted cuttings, un-rooted cuttings, or divisions of perennials. CBG does not keep track of the condition of plants once it reaches the recipient (the Rice Foundation garden is an exception). They also send seed to the Millennium Seed Bank in the UK. About ten years ago CBG stopped participating in Index Seminum.

CBG distributes plants because:

It's the old adage, if you've got something and you really want it, give a piece away. 'Cause inevitably, something will happen. And in the best of all conditions, you can go back to your friend who will share a piece of your plant back with you. And we've found that to be true with the collections base... The last thing I want to do is have a request come in for some germplasm that is unique to the garden and that no longer exists and we haven't shared it with somebody else. And those kind of situations is a lose-lose for everybody.

CBG keeps track of distributed plants in an Excel spreadsheet. The information is not stored inside their custom plant records database. A note in the main records database explains that the plants have been exchanged with a foreign institution and to see the Out Of Garden Transfer Excel spreadsheet. He said it is "something we need to address."

When CBG gives away a plant, it sends all of the accession information and "passport data" with it. To ensure the success of a program, keeping track of accession numbers is essential. It would be useful for CBG to track the recipient organization's accession number, too.

CBG has needed to retrieve plants that it had given away. Even though there have been "a couple requests that we couldn't fulfill," Tankersley believes the CBG program to be successful and that it meets the institution's goals.

When asked what parts of a program he believes are most important, he responded:



I think it's the philosophy. That we're part of a bigger whole. And it goes back to that old garden adage "That if you want to keep something, you give a piece away." Because there are man-made and natural disasters that strike plant collections and it's very disheartening when that happens and there were no backups anywhere else. It reminds me of cloud computing. We've got the information here at the garden, but we've also got it up in the clouds. If the local servers go down, we haven't lost everything. It's kind of the same approach with duplicating germplasm.

The CBG program could be improved by following up to find out if distributed plants are alive or not. They do not normally know of a plant's condition until someone requests a plant that is no longer at CBG and Tankersley starts looking for locations where the plant was distributed. He described it as "an ad hoc basis." He said, "The preservation and protection of the cultivar germplasm is the weak link, because we don't even have an informal agreement to duplicate collections."

### **Interviews with Cultural Institutions and Non-profit Professionals**

#### **Kyle Cheesborough. Bellefontaine Cemetery and Arboretum.**

Kyle Cheesborough is the Horticulturist at Bellefontaine Cemetery & Arboretum, located in St. Louis, Missouri. It is an active burial ground as well as an accredited arboretum. Bellefontaine is 314 acres. Cheesborough started working at Bellefontaine in April 2013. He is the only professional horticulturist on staff. Bellefontaine's mission is "to preserve many aspects of the historic landscape and utilize our green space to conserve plant material, provide habitat for local wildlife, and create an inviting space for the public."

Bellefontaine has given small amounts of plant material to a local non-profit and a commercial nursery business. They are open to sharing with other institutions "in order to further our living collections." Bellefontaine does not have a written loan or exchange policy.

There are many older trees of significant size throughout the Cemetery. Cheesborough is not aware if the Cemetery gave away or received any historic plants or trees in the past. He would like to work with a botanical garden or arboretum in the future. He feels “the large amount of land that we work with could provide an excellent opportunity for growing larger specimen material that may be out of place or may not fit in other gardens.” Receiving plants fits within the organization’s mission.

Cheesborough could keep track of plants if given the database to do so. He would be willing to report back on plant health and is comfortable reporting general health details as well as disease and pest issues. Tracking of plants could be done by paid staff.

The Cemetery would be willing to pay a fee for plants, but only to an extent. Cheesborough would prefer “a partnership of open exchange.” He thinks that a fee “would likely exclude smaller institutions or those with tight operating budgets.”

He would be willing to return plants or a piece of them to the original garden if the original plant was damaged or destroyed. He anticipates “the biggest part of this program is to perpetuate these collections so that in the event of detrimental loss to original sources, these plants can be replaced with populations of the same provenance.”

To make a plant distribution program win-win for Bellefontaine, Cheesborough would like an open exchange between institutions. There would need to be an understanding that Bellefontaine does not have growing facilities and that they could only accept plants (no seeds or un-rooted cuttings). He would prefer already propagated, potted or established material. To ensure the success of the program, Bellefontaine would need established plant material, with quart sized pots the minimum they can receive. However, he can also take bare-root material that can be shipped according to the optimal planting time.

“A dedication to success on both ends and an understanding of limitations on either end” is the most important part of an exchange program. He would like to see a network built with institutions that are suited to the needs of a partnering institution. For example, a garden that does not have growing facilities partners with an organization that can grow plants to an acceptable size for the recipient garden.

### **Linda Eirhart. Winterthur Museum, Garden and Library**

Linda Eirhart is the Assistant Director of Horticulture at Winterthur Museum, Garden and Library. Winterthur represents the excellence of decorative arts between 1640 and 1840. The garden was created in the early 20<sup>th</sup> century by Henry Francis du Pont who was in contact with the top horticulturists. Eirhart helps to oversee the gardens and grounds that make up the expansive estate of over 1,000 acres. Winterthur employs 13 professional horticulturists to care for the gardens. They also use volunteers.

The Winterthur museum has a loan policy and loans out items. However, the garden has never taken a “loan” of a plant. They have received plants from botanical gardens in the past, and they have shared plants with botanical gardens. There was never an intention of returning the plant or plant material. In autumn 2013, Eirhart received a peony from Matthaei Botanical Gardens and Nichols Arboretum (MBGNA) in Ann Arbor, Michigan. The curator gave Winterthur one peony that they historically had but was now missing from the collection.

Eirhart said that receiving plants could fit with Winterthur’s mission. They are very selective in the plants that they receive, so any plants would have to fit the design concept of the Winterthur garden. The cultivar would not have to be historically used at Winterthur but it would have to fit the design style.

Winterthur has used an outside propagator to duplicate plants, mainly rhododendrons, that are important to the site. Many of the original rhododendrons lost their names over the years and some of the broadleaf rhododendrons were never named. They use the propagated rhododendrons to fill in gaps in the landscape where shrubs need to be replaced.

When they have received plants in the past, they have not signed an agreement. When she received the peony from MBGNA, nothing was written. There “was sort of a verbal understanding that it was going in the Winterthur garden. As far as reporting back, it was just a mutual understanding that if he ever called and wanted a piece back, we would provide it.”

Winterthur accessions its plants. MBGNA is listed as the source of the peony. If an original institution gave Eirhart an accession number, she would include that in the database. MBGNA was not provided with the Winterthur accession number for the peony.

Eirhart would be willing to report back to a botanic garden on the health of a plant if she had “a reminder.” With the Winterthur plant records system it would be fairly easy to keep track of plants and check to see if they are alive. Winterthur horticulturists are responsible for filling out a form for the records when a plant dies. A yearly report could be generated from the records. Reporting more detail than if a plant is alive or dead would take more work.

Eirhart would be interested in working with a botanical garden or arboretum in the future if it fits within the mission. She said “botanical gardens been an excellent source of plants that we cannot find from other sources.” Winterthur will continue to work with botanical gardens and arboreta to find plants needed to complete or enhance

the garden. She would “definitely” be willing to return a piece of a plant if the original was destroyed.

Eirhart would be willing to pay a fee for plants if it is something that she wants, as opposed to just trying to find a home for it. She thinks a fee could put a “vested interest” or “commitment” in plants received. However, she said, “If I feel like I’m the one that’s doing you a favor, then I would appreciate it being free.”

“We like idea of having plants in at least a couple different places so that we have that safeguard of at least a few options.” She emphasized creating a larger network for a plant collection so that “a little piece of plant history is protected.”

### **Cathy Fields. Litchfield Historical Society.**

Cathy Fields is the Director of Litchfield Historical Society. The Society is a small, American Alliance of Museums accredited historical society dedicated to collecting, preserving, and interpreting the history of Litchfield County, Connecticut. It operates a library and archives, a museum, and a historic house. The Society has a staff of five people. It does not employ a horticulturist. Fields has been the director of the Society for 27 years.

The Society owns a site named the Tapping Reeve House and Law School. Six acres of land surround the building. Fields wants to start thinking about what to do with it and how to interpret it. There are no historic plantings around the house. Fields is not looking to restore the landscape; she is interested in interpretive spaces to talk about different landscapes and what it might have been.

All lawn and garden care is contracted out. She described the gardens as “very basic.” There are planted ferns and flower beds; otherwise there is mainly trees and lawn. They have no records, so they “fly by the seat of our plants.”

They have received plants from different sources. They have roses from cuttings from houses in town and Fields knows they have received plants from other gardens and historic sites, but they have no records on the plants and do not accession them. The Society recently received a tree from the Harriet Beecher Stowe Center; they did not make any agreement other than to plant the tree.

The Society would be interested in working with a botanical garden or arboretum in the future. They would be able to keep track of plants. The company they work with for landscaping could document the plants. Record keeping would be done by a volunteer. She does not have the staff for plant care or records.

Fields is nervous about the idea of accessioning plants—it would be a different direction for them—but she would consider it. The understanding that the plants are historic and need to be accessioned might take education for the board. “We try not to destroy collections and it feels dicey with plants.” Record keeping would be a different approach for the organization. It is another obligation that someone has to do, which is hard in a small organization. She wondered if there would be ramifications if one of the plants died.

The organization might be willing to pay for plants. There is a budget for landscaping and lawn care. If they decided to participate in a program, plants would go to the Tapping Reeve House and they would build costs into the new landscape.

To make receiving and caring for plants win-win for the Society, there needs to be an “interpretive part,” a story associated with the plant or the program to interest her visitors and the board. She likes the idea of explaining to visitors that they are working with another institution to save plants. Any plants could fit into what they are want to do with the landscape, but that it would be more interesting and valuable if they could tie the

plants to the Society, or to Litchfield, or to western Connecticut. She doesn't want "just a random plant." She would be willing to return a piece of the plant if the original died.

The most important part in ensuring a successful program is keeping records current. Records are vital because "usually in institutions like this staff changes and people might not know or be able to figure out what happened." Communication every year or two years between the Society and the donor institution would be very important for continuity. Staff training might be helpful. Fields would like to see something written on the best way to care for the plant (like instructions from a nursery). It would be easier to keep track of the program or receipt of plants if it "pops up" more often in files and policies.

She cautioned about using the words "accessioning" and "loaning." In the Society's collections policy, if something is accessioned it is never given back. She said "because it's such a different concept from accepting a piece of furniture, it would probably have to go in a subset of our collections policy for living collections and have it really spelled out."

Fields emphasized the importance of communication. She wants to see documents with "language that is clearly spelled out in terms of how these plants are treated in terms of us and the original donor." She needs to know the extent of responsibilities upfront.

**Anne Symmes. Beatrix Farrand Garden Association.**

Anne Symmes is the Executive Director of the Beatrix Farrand Garden Association (BFGA). BFGA is dedicated to honoring and sharing the environmental and design legacy of Beatrix Farrand. BFGA has restored the gardens at Bellefield, a historic house and National Park Service owned property in Hyde Park, New York. Anne Symmes has worked at Bellefield for 16 years and is the only horticulturist on staff. She

is trying to restore the gardens so that they contain the plants that Farrand specified in her original design plans.

In the past, Symmes exchanged iris with the Thomas Jefferson Center for Historic Plants (TJCHP). She was searching for named iris varieties from Farrand's plant list including 'Black Prince' and was referred to the TJCFP. 'Black Prince' was not for sale, but the curator sent a few rhizomes to Bellefield. Symmes planted the iris and they did well. After five years, the TJCHP curator called and said that they had lost all of the 'Black Prince' irises. She asked if she could have rhizomes to re-establish them. Symmes thought this was an example of why it is a good idea to share or exchange plants.

Asked if she would be interested in partnering with a botanical garden or arboretum, Symmes said she "would be thrilled to participate in any way." An exchange fits within the organization's mission.

The most important aspect would be to find historic cultivars. She has a list of peony varieties and has not been able to locate some of them. "I would love it if we could add to our collection with specific plants that Farrand had called for in her plans. That would be my top priority, but I am also interested in old varieties of the era the garden was designed in 1912."

The BFGA organization does not have a written loan policy at the site. Most of what they do is very informal, but the organization would be comfortable signing a more formal agreement for plants. It would be an important way to help track or keep a record of the partnership.

She has a plant list, but it is not in a database. It would be useful to use an Excel file so that she can keep track of sources. "That's something I would be happy to start because it would probably be a better record keeping."



Confusing plant names would not be a problem. She knows every single plant in the garden. They are running out of space, but could make room for three or four new plants if they knew the cultivar names.

Responding to record-keeping and reporting on plant conditions, Symmes said that the BFGA would be able to report back to the original institution if a plant died or became diseased. It should be clear who was supposed to check with whom.

BFGA would be able to pay for plants, but they do not have a big budget. They could pay for shipping.

The most important part of an exchange would be to have definite identification of plant varieties or cultivars. Having plants from Farrand's era and plants that she felt were worthy is "the whole purpose of why we're here...It's one thing to be a pretty garden in the style of, but we're trying to do something more than that."

Symmes is not worried about demands on staff time if she receives a small number of plants. She would like to have examples of database spreadsheets so that they could keep quality information. Recommendations for fields in Excel would be helpful and important so that everyone is on the same page.

### **Interviews with Plant Conservation Experts**

#### **Pam Allenstein. North American Plant Collections Consortium**

Pam Allenstein is the Manager of the North American Plant Collections Consortium (NAPCC) at the American Public Gardens Association (AGPA). Her position as manager is partly funded by the United State Department of Agriculture (USDA). NAPCC has a separate mission from APGA. NAPCC's goal is to build a network of North American public gardens and arboreta for the purpose of coordinating a "continent-wide approach to plant germplasm preservation, and to promote high

standards of plant collections management.” The interview focused on what NAPCC is currently doing to support collections and how a non-profit might oversee planned distribution of plant collections in the future.

NAPCC collections are often grouped by plant family or genus, but they are not necessarily limited to species. Many collections also contain cultivars. Some collections are primarily cultivars. The application process to become an NAPCC collection is basically the same for species and clonal collections. There is a one-time application fee of \$750 for NAPCC that is in addition to an institutional APGA membership fee.

NAPCC requires electronic record keeping on the part of the collection holding institution. A collections policy that is institution wide helps gardens and arboreta deal with changes in administration and helps sustain longer term support for a collection.

NAPCC encourages its members to back up their collections. Allenstein tries to encourage collection holders to look beyond their institution and benchmark. She hopes that this will help collection holders begin thinking of “planned redundancies” as backups.

NAPCC applications ask questions about safeguarding the collection, such as, “Describe how you safeguard the collection. Are accessions backed up on site or at another garden? Do you maintain replicates in a seed bank or gene bank? Does your institution’s disaster plan address living collections?” The application questions are “a way of raising awareness. It’s not a requirement, but it’s trying to raise the bar to make sure that is covered.” As natural disasters seem to be increasing and new pests and diseases are endangering and wiping out living collections and wild populations, there has been greater emphasis on duplications within collections. Allenstein stated,

It’s going out of fashion to brag about having the only one of something.  
As far as living plants go, it’s saying you’re not doing your job very well!  
This is a warning sign, if you find out you have something that is that rare

and it's a living collection, then it is by definition vulnerable and you'd better be thinking about ways to propagate it. At least the beauty of living collections is that you can reproduce and distribute, versus say an art collection.

Asked if NAPCC encourages the distribution of plants to other gardens, both APGA and non-APGA, Allenstein explained that because support for NAPCC comes from APGA, they limit to member gardens. However, NAPCC respects the sovereignty of the collection holders and what they do with their collection including propagation, so long as it is within legal limits. There is implied encouragement or underlying philosophy to make plants available to other institutions and qualified researchers.

NAPCC does not work with private collection holders because "we have limited resources and we have to figure out what we're going to prioritize." From working with organizations in other countries, she has learned of the challenges of relying on a single collections manager. There is a dilemma of what happens to the collection once the holder is unable to maintain the collection and needs to give it up. Record keeping is often compromised.

Her thoughts on creating a non-profit that would oversee plant dispersal are:

There are more small gardens that make up APGA than medium sized or larger gardens. There are historic gardens, historic sites, zoos, the scope of membership in APGA is really broad. To think that there would be a need to for yet another non-profit to manage plant exchange...I tend to be more of a lumper than a splitter. I've seen so much of proliferation of organizations with overlap or unplanned redundancy of missions and unintended competition or parallel efforts especially when it comes to conservation. In the case of the NAPCC program, it should be poised to be adaptable to the needs and desires of its participants and keeping in mind external conditions, changing conditions, to deliver what is needed to preserve plant collections and plants.

You have APGA, BGCI US, the Garden Conservancy, the Center for Plant Conservation, you've got individual gardens with huge operating budgets that can do as much as any organization or association can do...I don't see a need for another program. I can see an evolution of an existing program

or more collaboration in strengthening ties between existing organizations to accomplish the same purpose.

She finished by saying “It [a duplicate plant collection] seems like a fantastic opportunity for emergent collections or large new gardens if they could or wanted to jump start a collections program to back up someone else’s collection.”

**Abby Hird. Botanic Gardens Conservation International U.S.**

Abby Hird is the Program Director at Botanic Gardens Conservation International US. BGCI US is a satellite office of Botanic Garden Conservation International (BGCI), a global organization with the mission “To mobilize botanic gardens and engage partners in securing plant diversity for the well-being of people and the planet” (BGCI US). Abby Hird is the main contact in the US. She is responsible for BGCI’s data services and works to increase awareness of the resources available to public horticulture and conservation organizations, as well as to increase collaboration among BGCI members. The interview focused on what BGCI is doing to preserve cultivars and how cultivars might fit within its programs.

BGCI has been involved in the recent past with a cultivar project for PlantSearch. BGCI worked with the Royal Horticultural Society (RHS) and their “Find a Plant” database. They found that there are no global databases or lists of cultivars. However, there are lists among plant societies. BGCI does not have the time, space, or capacity, to seek out all the different lists. The RHS “Find a Plant” database was the only resource BGCI found. BGCI created a partnership with the RHS to do a pilot study on verifying names in PlantSearch using the “Find a Plant” database.

BGCI has a focus on plant conservation; species conservation is the organization’s highest priority. Hird said, “While we think it’s great to preserve cultivars, we don’t have the capacity and our first priority is to focus on species.” BGCI is trying to

save naturally occurring plant species that have declined mostly due to man-made causes. BGCI went into the cultivar project because it saw that there are people who are interested in preserving cultivars.

BGCI's Plant Search is created from taxa lists uploaded by gardens. BGCI does not verify cultivar names. BGCI verifies that the genus and species are valid names. The cultivar field is not "curated." Hird said that about 40% of Plant Search names are cultivars.

PlantSearch is a tool for garden staff to see and compare what other garden collections. It is the only global database. Thirty percent of botanic gardens are able to provide plant lists to BGCI. PlantSearch allows garden staff to upload their plant records and receive a report that cross-references the plants with global conservation data. The reports lists other collections that report the particular taxon, even a cultivar name. The report can reveal if a garden's collection is unique. The data is only as good as the information provided and the sample size.

Hird mentioned different societies that are working to preserve cultivars, like the International Lilac Society. In the agricultural sector, there are people interested in preserving wild and heritage food crops, like apples, corn, and wheat. She said that there is not a lot being done, but there is some interest. She believes that the Royal Horticultural Society and Plant Heritage in England would be good models for cultivar preservation efforts.

### **Sophie Leguil. Plant Heritage.**

Sophie Leguile is the Threatened Plants Project Coordinator at Plant Heritage. Plant Heritage (PH) is a non-profit organization based in Surrey, England. It is separate from the Royal Horticultural Society (RHS). PH was founded in 1978 as the National

Council for the Conservation of Plants and Gardens (it is still commonly referred to as NCCPG). Plant Heritage is a membership-based organization. There are eight staff members; most are part-time staff. Sophie Leguil oversees the Threatened Plants Project (TPP), an initiative dedicated to conserving cultivated plants that have been grown in the UK. The interview focused on PH, its efforts to protect cultivars, and the challenges it faces.

PH is based around the scheme of National Collections. National Collections are comprehensive collections of one genus. They are made up of species, or cultivars, or a mix of both. The focus is on those species and cultivars that have been traditionally grown in the UK. They are usually held by public gardens, universities, and dedicated individuals. To date, there are 620-640 different National Collections. A single collection can be very large, such as the Fuchsia collection held by one enthusiast which contains approximately 4,000 specimens.

PH's main challenge is succession of collections. PH members are generally older. Leguil estimates the mean age of collection holders is 60-65. According to Leguil, "one of the big problems" is a collector's inability to continue collection care. She said, "Sometimes if the person becomes ill or they die, the house gets sold and the plants disappear and we never hear of them any more. Succession would be the biggest challenge."

PH are concerned about collections depending on one person. It is a problem at private gardens as well as at university owned gardens. Sometimes a head gardener with a passion establishes a collection, but the collection slowly dies if the gardener leaves the institution.

Funding is another challenge. Collections are at risk because of cost. PH does not list many collections at big institutions. Costs can be one of the challenges, especially for collections of many specimens.

Leguil and the TPP are in charge of developing a “big list” of cultivars growing or once grown in the UK that have become threatened because they are no longer popular. She uses the HRS Plant Finder, lists of plants in gardens, old catalogues, and old books, to make a list. She then determines which plants are still popular or can still be purchased. TPP establishes a list of all cultivars which are threatened according to set criteria. Then PH staff searches for them using databases and records from gardens. They make a short list of what could not be found. Finally, they give the list to experts, usually the national collection holders or experts on the genus, and they vet the list. They remove any cultivars deemed to be unworthy of preserving and focus instead on those that “are really important and it is worth it to try and find them because they’ve got breeding potential or historical reasons.” They have done cultivar lists of about 400 genera now.

In the past, when a collection holder died, PH simply removed the collection from the records. Now, if someone wants to withdraw a collection, PH staff uses the results from the TPP list to inform them of which plants are most important to save. Leguil clarified,

Instead of having to deal with the whole collection, we only have to deal with a third or half of the collection. We establish a list of plants that are more interesting, and we can pass it to experts or other collection holders—this is happening now with the fuchsia collection. About 20 were rare from the 1800s. So another collection holder had said that they were going to get cuttings so that the collection won’t get lost.

PH is in the process of building a website to share information about all the threatened cultivars. PH can then determine which genera need a National Collection and begin to search for the threatened cultivars. Of all the threatened plants they have

identified, National Collections hold about 50%. The website will link with another initiative called Plant Guardians.

Plant Guardians is a new scheme intended to further involve PH's 4,000 members. Many members cannot maintain a whole collection, but PH wanted to find a way for them to assist conservation. In 2013, Plant Guardians was launched as a way for members to register their rare plants. Members access a website, enter their membership number and the information for their plants. The plants are then registered on a list.

Leguil explained,

So if you go on our website, you can download lists and see all the rare cultivars and species that [Plant Guardians] have. Once they register their plants, we check if the plant is really present or not. We've got plants that are endangered in the wild. So people can take part in conservation. It's working because just yesterday I got a call from a collection holder that someone on the list has a plant they have been looking for for 20 years. It's sort of putting collection holder and everyone together. It doesn't take much effort from the members and they feel like they are really taking part in conservation, even though they can't have big collection of plants.

PH requires collection holders to have duplicate plants and duplicate labels. For most collections, apart from the trees, PH requests that they keep at least three specimens of each plant and, if possible, to have a backup at a different location. The backup can be in different forms, sometimes in labs or as seeds. Duplicates might be planted right next to each other if a collection is in a small garden. PH encourages collection holders to share the plants. PH requires annual updates from each National Collection and the Plant Guardians so that they know which plants are alive, which plants have died, and which new plants they have acquired.

The national office of PH seldom works with collection holders to back up collections. Such projects are generally the responsibility of the local or regional coordinators (volunteer positions). Local groups are trained yearly and aware of the



policies. They handle all the local queries. Complicated questions or requests come to the national office.

Funding is always an issue for PH. Membership is the biggest contributor. They also have legacies and some sponsorship from plant label companies.

Plants are dispersed when collection holders sell plants or at the annual plant exchange which takes place during the annual meeting. There is no tracking of plants, but now, with the Plant Guardian scheme, PH encourages members who buy or exchange plants to register them online.

**Dr. Margaret Pooler. US Department of Agriculture/Agricultural Research Service at the US National Arboretum (USNA).**

Dr. Margaret Pooler is a Research Leader at the US Department of Agriculture/Agricultural Research Service at the US National Arboretum. She works within the Floral and Nursery Plants Research Unit. She is an expert on the USNA plant distribution program. The USNA was founded in 1927 and began distributing plants soon after its inception. The US Department of Agriculture is a partner with APGA in supporting NAPCC. The interview focused on the USNA's distribution program, what it entails, and how distributed plants are tracked.

Dr. Pooler explained that the USNA does not give away plants as a way to safeguard them. It is a way to distribute them so that other people will use them. The plants are either germplasm that the USNA wants people to test—like new hybrids—or a plant in the USNA collection that should have wider usage.

For every plant that the USNA sends out, a record is kept in BG Base, listing the address, the contact person, the date the material is sent, number sent, and the type of

material (e.g. seeds or rooted cuttings). There is also a place for notes, so they might add more information.

If plant material is sent out for research and evaluation, then the cooperator signs a Materials Transfer Agreement (MTA). They are not to grow and sell the plant, only to evaluate its performance. Research material for evaluation is generally sent to partners, businesses or nurseries or botanic gardens, which the USDA has been working with for a long time.

Many plants go out as part of the National Plant Germplasm System (NPGS); they are free for anyone and have no strings attached. They might be used for a short term study. However, the BG Base records state whether there is an MTA.

USNA staff do not follow up after shipping to see if plants are alive. If a plant does not come in good condition, the recipient will usually notify them. If a plant is sent out for evaluation, then the USNA contacts the recipient (sometimes several years later) for evaluation information. The USNA does not expect the partner organizations or nurseries to initiate contact. They do not follow up on plants that are given away for reasons other than evaluation.

Pooler said that the collections are the most important part of the Arboretum. There are seeds in storage and a limited number of seeds are sent to the National Center for Genetic Resources Preservation facility in Fort Collins, CO. They do not backup collections for extremes like weather because “we wouldn’t take responsibility for [a plant] if we didn’t think it would grow and thrive in our environment.” If a plant becomes diseased or must be removed, staff will take cuttings and try to propagate it. There is a plant collections committee that makes sure “we’ve backed it up somewhere or we’ve taken cuttings that have survived or we can try to transplant it or we can get it from

somewhere else to repatriate it. We are careful about not cutting down a plant on a whim. It's a careful process."

If a plant is healthy or it is not a unique or rare specimen, it will not necessarily have a backup. She said, "It depends on whether it's woody or herbaceous and then the long term vision." She acknowledges that herbaceous plants "you can lose...almost overnight." However, she believes that USNA would be able to reacquire most cultivars.

Pooler explained:

We don't backup, but we know the value of the accessions and if one starts to decline that we need to do something about that one fast. I can't imagine that we would lose something so suddenly that we would lose the germplasm. Even if a hurricane came through and knocked down a tree, we could probably still get cuttings or root suckers. It's rare that something dies overnight. Even if we had duplicates, the kind of event that would kill one would probably kill all of them.

Plant records are "probably the most important thing...For any plant distribution or collection, plant records [are] the crux of everything, the hub of any botanic garden...a centralized place or database that records what comes in, where it is, what its status is, what goes out."

Pooler believes:

Backing up at another site is not a bad idea. Especially with the threat of pests or diseases that come through. We don't really do that. I think we could benefit from that, but of course we can't back up all the plants in the Arboretum. For [core] collections we're saying we are at the center of, we should have some type of backup or for plants that are unique for conservation purposes, like they're wild collected and no longer available, those should be priority for backup.

## **Chapter 5**

### **DISCUSSION**

#### **Introduction**

In the recent past, a growing number of horticulture professionals and amateurs in the United States and abroad have expounded upon the value of preserving cultivars of plants. Opinion pieces published in various horticulture journals have heartily advocated for the preservation of cultivated plants. Books have been written to guide homeowners and professional preservationists in choosing the appropriate plants for historic gardens and to assist in sourcing and identifying older varieties (Adams, 2004; Cothran, 2003; Favretti, 1978). However, as David Sole of the Botanic Gardens of Wellington, New Zealand, explained:

There has been a drastic loss in the range of species, hybrids, and cultivars in production with mass production of select few cultivars currently ‘in fashion’, the closing of long established and often specialist nurseries, the loss of skilled people from the industry, the dissipation of private collections, and loss of institutional and personal knowledge of plant collections.” (Sole, 2009)

There are several organizations in the US that are dedicated to landscape and garden preservation. Nevertheless, little has been done in the US on an organizational level or in a programmatic fashion to preserve cultivated plants. It is therefore necessary to take a closer look at Plant Heritage, the leading international model for ornamental flora preservation, to better understand challenges and what promotes or hinders its success.

## **Plant Heritage**

Plant Heritage in the United Kingdom is the most well-known organization dedicated to preserving plants. Now 35 years old, Plant Heritage (PH) is the most successful organization and the standard to which others are held. PH works with professional and amateur botanists, horticulturists, conservationists, and gardeners, to protect cultivated garden plants. Although the PH model of working primarily with individuals to preserve cultivars has worked quite well, it is not without its challenges.

There are several disadvantages to working with a single individual, whether a home gardener or someone employed by a larger institution. When the enthusiasm for the collection is held by one person, oftentimes the commitment and knowledge of the collection is lost when the person leaves the position or can otherwise no longer care for the collection. Collection standards are also often lacking. Not all collection holders that work with PH keep their data in the same format; PH reports that records range from index cards to BGBase (Morris, 2011).

A collection held by an individual is also “more vulnerable to loss of records, relocation of collection, and dispersal of both. The reason for this is that on the whole, people are shorter lived and more mobile than institutions” (Morris, 2011).

Utilizing private gardens to preserve plants also limits the public’s enjoyment of those plants. PH requires that collections be open to public enjoyment at least one day of the year, but would like its members to welcome more visitation. The National Collections often have “minimal involvement in access and benefit sharing activities” and PH has been unable to determine “the small amount of actual restoration and reintroduction being achieved” (Morris, 2011).

At this time, there is not a formal “back up” scheme for the National Collections. PH encourages its collection holders to maintain a duplicate collection at a different

location, but it is not required (Plant Heritage, 2008). Some collection holders, like Alan Schipp of the National Collection of hyacinths, worry “the disappearance of such a collection also means the total disappearance of that group of plants...I am very convinced that there should be a backup location, and preferably several, for all threatened plant varieties” (Leijenhurst, 2011). In small gardens, duplicate plants might be planted right next to each other (Leguil, 2014). PH entrusts its local or regional coordinators to assist with duplicate collections or to step in if a collection is threatened. Without backup collections, in the past, when a collection holder died or became ill, “the plants disappear and we never hear of them any more” (Leguil, 2014).

The strengths of PH are its years of experience and name recognition, its base of enthusiastic supporters and volunteers, and its online tools for plant records and member collaboration. The weaknesses of PH include its quickly aging base of supporters, its reliance on individuals to care for collections, and its inability to require succession planning or off-site duplication of collections. PH’s system has worked in the past in the limited geographic area of the UK. It is not, however, a perfect model and should not be precisely replicated in the US.

### **Collaborations**

Institutions or organizations working together to preserve plants is not inherently better than a single organization working with individuals. Institutions and organizations present their own set of challenges. Based on the research, it appears that staffs at U.S. botanical gardens and arboreta have not yet begun to really think about planned distribution of plants and keeping track of them. Most of the subjects interviewed thought of tracking distributed plants as a new idea. However, in the US, the tradition of gardening is different from that of UK—home gardening and plant societies do not have

the same history or cultural value. The different perspective on gardening, combined with vast geography, wide ranging climates and soil types, poise public horticulture institutions as the clear leaders in the effort to preserve horticultural heritage.

Holding collections in more than one location can be beneficial for more than one reason. Partnerships across geographic areas lessen the risk of cultivar extinction due to negligence or undetermined natural causes. They also allow for “greater resilience” in the face of natural disasters, new pests, and climate change, and provide opportunities for research (Morris, 2011). Growing plants in different locations might allow specimens to thrive in a backup location more so than in the original location (Johnson, 2014). For example, *Narcissus jonquilla* are at the northern reaches of their hardiness at the Chicago Botanic Garden. Sharing specimens with an organization further south might not only duplicate at-risk cultivars but also allow those plants that struggle in Chicago to flourish.

Growing a plant in more than one location allows for greater awareness and public interaction and enjoyment of the plant. A partnership between a botanic garden and a non-profit organization, such as a museum or cemetery, can solve the problem of public access to the plants and, in the case of planting at a historic site, “reintroduction” to a garden setting is achieved. Placing germplasm in cryopreservation is an option to preserve tissue, but some have expressed concern with tissue preservation as the only backup. Some interview subjects expressed the opinion that, without a specimen in constant public view, the purpose of the plant—to be beautiful and to delight the viewer—is defeated (Michener, 2012).

Survey responses and interviews corroborate that US public horticulture institutions are sharing plants. The majority of survey respondents said that they distribute plants and, it appears, that they give to a variety of organizations, businesses, individuals, and academic programs (Appendix B). According to Robert Mottern, most

gardens are willing to share with another garden if requested, but it is not a formal exchange or agreement. He explained, “We’re all trying to promote horticulture as much as possible. Most gardens have plant sharing policies, but it’s not necessarily for safekeeping their own” (Mottern, 2014). Montgomery Botanical Center gives away plants because “Sharing plants is the way to go because you never know what is going to happen. There could be any kind of thing that you’re not planning for—or that you are planning for—that can take one of your prized plants away” (Griffith, 2014).

Survey results show that, although most botanic gardens and arboreta do record who they have shared plants with, most do not check to see if the plant survived at the new location. Interviews supported the survey findings. Griffith said he is “too busy to check up on anything outside the fence here” (Griffith, 2014). Tankersley estimated that 90% of plant material shared by Chicago Botanic Garden goes to graduate students conducting research; he expects that it is destroyed at the end of the research project. Carmichael said that he “seldom” keeps track of plant health. Under rare circumstances a colleague might tell him if a plant failed and, in that case, that information would be entered in notes for the accession but “that’s pretty random” (Carmichael, 2014).

Cultural institutions and other organizations are interested in partnering with botanic gardens and arboreta to receive plants. 70% of survey participants said they would be interested in receiving plants from a botanical garden or arboretum. Fifteen out of 19 interviews affirmed the survey results. When asked if she would be interested in partnering with a botanical garden or arboretum, Symmes said she “would be thrilled to participate in any way” (Symmes, 2014).

Some interview subjects were reluctant to say they would be interested in receiving plants. They expressed concerns about the terms and conditions of an exchange or partnership, and said that they would like to discuss possibilities with a botanic garden



or arboretum (Conley, 2014; Gleaves, 2014). Tony Shahan elaborated, “I would want to talk about logistics; my concern as a site would be taking the responsibility of safeguarding plants and having something go wrong” (Shahan, 2014).

### **Case-by-case**

At this time, there is not a non-profit organization prepared to facilitate the distribution of cultivated plants or sharing between institutions. It is up to interested public horticulture institutions to take on the project of finding potential partners, developing agreements with them, and overseeing the long-term collaborations on a case-by-case basis. Every organization has its own special circumstances, thus “everything would have to be tailored specifically to the institution” (Becker, 2014). This would not be a departure from current practices; all interviewed public horticulture institutions currently distributing plants make decisions and agreements based on the separate and distinct circumstances of the situation.

### **Reaching out**

Some public horticulture professionals interested in sharing plants were unsure of how to reach out to other non-profits. They were not clear how to take the first step of finding another organization interested in receiving plants or letting them know what is available (Mottern, 2014; Steil, 2014). The curator at Matthaei Botanical Gardens and Nichols Arboretum (MBGNA) has been trying to find organizations with which to share peony cultivars, but he is dissatisfied with the current process (Michener, 2014). Beginning the conversation appeared to be a hurdle.

Cultural organizations and non-profits staff also said that they did not know how to find out which botanic gardens and arboreturns participated in plant distribution and what they have to offer. Google searches are not always useful as they do not necessarily

show plant lists at botanical gardens or arboreta (Ward, 2014). Tyler Diehl remarked that making plant lists available online would make it “quick and easy” for gardens to find each other (Diehl, 2014). A database of plant names and dates of introduction on a “major website that people would logically know to go to” was proposed to help historic sites find available plants (Bohlin, 2014).

### **Agreements**

To ensure the success of a partnership between a public horticulture institution and another organization, both organizations need be in agreement of expectations and responsibilities. Speaking on behalf of a historical society, Cathy Fields said she would like to see documents with “language that is clearly spelled out in terms of how these plants are treated in terms of us and the original donor” (Fields, 2014). Further, she would need to know the extent of responsibilities upfront. If she were to receive plants, “because it’s such a different concept from accepting a piece of furniture, it would probably have to go in a subset of our collections policy for living collections and have it really spelled out” (Fields, 2014).

Krystyn Hastings-Silver said that she wants a “standard operating procedure” so that, if she takes possession of a plant, she has a clear outline and expectations so that she would not disappoint the donor. She needs to know her responsibilities and what the donor institution hopes to get from the relationship. She would also like to know how long she is committing to caring for the plant as well as how much time is needed weekly for monitoring the plant and keeping records. She said that, without clear expectations, “sometimes we say ‘yes’ and then we can’t follow through and that would disappoint everyone” (Hastings-Silver, 2014). She believes that a protocol is key for success, so that

people can commit or not commit based on the desired net outcome (Hastings-Silver, 2014).

Although loaning and borrowing objects from a museum is different than sharing living plants, best practices in museum policies can assist collaborating institutions in formulating an understanding. Sample loan policies can be found in books on registration methods. “Do not fail to get everything in writing” is the standard for museums loaning objects (Reibel, 2008). However, among botanical gardens and arboreta, there is a tendency to make verbal agreements between institutions (Eirhart, 2014; Griffith, 2014; Michener, 2014). At Chicago Botanic Garden, Tankersley explained, “the preservation and protection of the cultivar germplasm is the weak link, because we don’t even have an informal agreement to duplicate collections.” It is a good idea to formulate a procedure and stick to it (Reibel, 2008).

Memoranda of understanding (MOU) or memoranda of agreement (MOA) can be a useful tool to spell out all components of the relationship between partnering organizations and to protect them both legally. Interview participants identified the following subjects as important to consider in the development of an MOU or any other written agreement:

- Scope of activities
- Identification of coordinators
- How many plants will be shared
- The names of plants shared
- Who initiates contact for reports on plant health
- How often contact is initiated
- Procedures if a plant becomes ill or dies

- What data needs to be captured and in what format
- Financial responsibilities
- Propagation and selling of the plants
- Start and end dates of agreement
- Expectations for return of plant material
- Laws relating to biodiversity

At least one organization is moving beyond just a verbal agreement in finding a way to share plants. Although MBGNA does not yet have a codified plan or policy for plant distribution, it recently signed a Memorandum of Understanding with the Central Botanical Garden of the National Academy of Sciences of Belarus to enable cooperative research and exchange of plant material, namely historic peony cultivars (Michener, 2014). Not all interview subjects welcomed the idea of formal agreements, though. Griffith said, “The last thing I want to do is give a plant to another institution with a lot of conditions or restrictions.” However, most non-horticulture based not-for-profit organizations welcomed the idea of an agreement for various reasons (Fields, 2014; Symmes, 2014; Ward, 2014).

When formalizing a relationship between organizations, the levels of responsibility need to be addressed. Several non-profit organizations expressed concern in both the survey and in interviews about the amount of staff time needed to care for plants and to maintain records. An agreement is more likely to succeed if a solution is found that is not onerous to the donor and not onerous to the receiver (Hastings-Silver, 2014).

Costs involved in distributing plants also need to be resolved. Most botanical gardens and arboreta do not appear to charge each other or other non-profits for plant material or live plants (Anisko, 2014; Griffith, 2014; Michener, 2014; Carmichael, 2014).

Nonetheless, expenses should be discussed if plants are to be shipped or if considerable resources have been or will be invested in plants.

Thirty-five percent of cultural organizations and other non-profits that participated in the survey said that they would be willing to pay a “nominal fee” for plants. Fifty-one percent were unsure. However, interviews suggest that most cultural organizations and other non-profits are willing to pay for plants received if the plants support the organization’s mission or design intent. Fourteen interview subjects said that they would pay for plants; two organizations said that fees would prohibit them from participating (Appendix H). Shahan stated that his willingness to pay a fee “would come down to the amount and the value to what we’re trying to do and how it fits in an overall scheme” (Shahan, 2014). Ward explained,

There is a financial aspect or hurdle that we’ve also experienced because, as you try to buy these plants on the open market, they cost a lot of money. A loan program, even with a small fee attached to help with maintenance on the giver’s side, would be fine as long as it was less than market value.

Gleaves wondered if a fee for plants or shipping might help determine how important a plant is to an organization (Gleaves, 2014).

Quill Teal-Sullivan clarified that her site would not pay for a large number of plants or for plants that did not conform to the design of the garden. In fact, in such a case, she would expect financial or professional support from the botanic garden or arboretum. “There would have to be something to make the time and finances to keep that collection worth it. So it’s not a burden” (Teal-Sullivan, 2014). If the plants received were something that her site really needed or wanted, “that might be different. But, if we were asked to report back, or care for them in a certain way, or keep records on them, then in that case we would want their technical support or opportunity to get further

training from their staff. If it's like getting five more peonies, then I don't think we would need financial support" (Teal-Sullivan, 2014).

Potential recipients of plants were concerned about ramifications if a plant in their possession dies. Eric Becker asked, "If something dies, is there a penalty?" (Becker, 2014). Museum staff in particular seemed to be apprehensive about taking on living collections. Fields said, "We try not to destroy collections and it feels dicey with plants" (Fields, 2014). Procedures and expectations for when a plant becomes diseased, attacked by pests, or dies, should be laid out in the initial agreement.

### **Long-term Commitment**

An overarching institutional commitment to a program to preserve cultivars is necessary for success. Institutional commitment must come from both interested parties. A program is hurt if it depends on the enthusiasm of one person. "Within the collections at PH, the level of commitment at an institutional level can be confined to the member of staff maintaining the collection (or the member of staff who started the collection). In the long term, this is insufficient" (Morris, 2011). Damon explained that she would want to see a "dedicated group within the organization to take this on even as personnel changes, so it wouldn't be forgotten if staff left or volunteers left. It would be [a] more established procedure and offering for us" (Damon, 2014).

Institutional commitment helps to ensure the longevity of a distribution program or a partnership between organizations. However, finding that commitment can be a challenge. Dr. Tomasz Anisko of Longwood Gardens explained:

This is the hardest thing to implement. We all want to distribute plants. We want our plants to go to Michigan and if something happens to our plant we can tell them to give it back. But it's difficult because usually there is significant time gap between giving the plant and needing to retrieve it. And usually the person distributing the plant or receiving the

plant is not the same person with the plant 10 or 20 years later. (Anisko, 2014)

Morris suggested that commitment to a collection be demonstrated by a letter of agreement with the trustees or the equivalent. She theorized, “This could lessen the possibility of collections that are owned by properties but are unwanted and irrelevant to the landscape, and thus inappropriate” (Morris, 2011).

Institutional commitment to a program of distributing plants or stewarding received plants can be demonstrated by inclusion of the program in the collections policies. Collections policies are part of best practices for botanic gardens, arboreta, and museums. Collections policies are part of what is called a “registration system” by museums. “The museum registration system is the museum’s memory. Long after the curators and registrars have come and gone, the record of the museum will speak” (Reibel, 2008). The collections policy or registration system sets out a consistent set of practices that should be followed through changes in administration (Reibel, 2008; Michener, 2011). Including in the collections policy the practice of distributing plants, in the case of a public horticulture institute, or receiving plants, in the case of a non-profit, ensures that associated staff members are aware of terminology, practices, procedures, and responsibilities, and how they support the mission.

Research shows that non-profit organizations are more likely to collaborate with a public horticulture institution if they see that they will benefit from receiving plants. Survey results show that organizations are more likely to accept plants that fit within their period of significance, that are identified with a past owner, or that fit within the design scheme. Most gardens want plants that enhance the current design; this was of particular importance to gardens without a historic component (Gleaves, 2014). The most attractive aspect for all organizations is that a plant “fits within the mission” (Gross, 2014). Some

said that they could not accept any plants that do not fit within the organization's mission (Conley, 2014).

Historic sites appeared to be very interested in receiving older cultivars that were previously grown on the property, included in an older design, or that were popular during a certain time period (Bohlin, 2014; Conley, 2014; Eirhart, 2014; Symmes, 2014; Ward, 2014). Historic sites often struggle to find older cultivars (Bohlin, 2014; Symmes, 2014; Ward, 2014). Bohlin said, "It's very hard to find the old [varieties]. Sometimes people look at us like we've totally lost our minds" (Bohlin, 2014). Ward expressed frustration, "Our organization has looked for plants, tried to find plants. We want to do our due diligence and put back the historic fabric of our properties, and we hit a lot of road blocks trying to find those plants" (Ward, 2014). Fields said that she doesn't want "just a random plant" (Fields, 2014). If public horticulture institutions can provide cultivars that have had their identities verified, they are more likely to find interested collaborators.

Frequently short of staff, non-profit organizations are looking for plant material that does not need a lot of care and that will do well in the current environment or growing conditions (Damon, 2014; Gross, 2014). One interview subject said she could only accept deer resistant plants (Hastings-Silver, 2014). They are also mainly interested in smaller numbers of plants (Gleaves, 2014; Shahan, 2014; Teal-Sullivan, 2014). PH recognizes "If it were possible to be part of a collection network with 5 or 10 accessions rather than 500 or 1000, more people would participate. In addition it would allow the inclusion of small numbers of isolated but important specimens that would otherwise not be included in a collection" (Morris, 2011). Shahan agreed, "What is critical is that you aren't taking on 50 or 100 of them. You're taking on a few of them, a handful" (Shahan,



2014). Instructions for planting and care were welcomed by non-horticulturists (Fields, 2014).

Some organizations saw the benefit of leveraging the partnership for publicity. Hastings-Silver said that she likes the idea of cross promotion in digital media. She said that she could see building a talk or tour around the partnership to save cultivars. (Hastings-Silver, 2014). Graham also said that partnerships should be publicized. Roberts liked the idea of botanical garden promoting her organization as “keepers and protectors of part of their collection” and said that she would do something of a similar nature, saying thank you for allowing them to keep part of the collection (Roberts, 2014). Roberts and Damon both said that they would like to use the partnership to elevate their organizations in the “horticultural world” (Damon, 2014; Roberts, 2014). Damon said she would like to be “more on the map of people who are interested in preservation gardens” (Damon, 2014). Michener said that he would like to build “social capital” for peonies and that he envisions the peony garden website as part of that effort. In the future, interested individuals should be able to visit the peony garden website and see list or map of where historic peonies have been dispersed around the country (Michener, 2014).

### **Record Keeping**

Keeping records of plants shared and plants received is essential. “With good records, more than the object is preserved. With poor records, something more valuable than the object itself may be lost...Good care includes good records” (Reibel, 2008). Without good records, the identity of plants can be lost. Without definite identification of a plant’s cultivar name, it lacks in significance and defeats the purpose of the plant distribution program (Michener, 2014, Symmes, 2014).

Research shows that a system for recording plant information and capturing data is important. Survey data shows that 79% of non-profits keep some type of records of the plants on their property (Appendix B). The majority of non-profit professionals interviewed said that they would be able to keep track of plants if given a methodology or a sample database. Symmes said that she would happy to start an spreadsheet file for record keeping (Symmes, 2014). Some organizations already use record keeping software and would be willing to add information about the received plants (Diehl, 2014; Wilson, 2014). Most would also be willing to report back on plant health or condition (Appendix H). Based on information gathered from interviews, responsibility for keeping track of the condition of plants was almost equally split between paid staff and volunteers.

Interviews support the idea that regular contact between partnering organizations is important to program longevity. Some public horticulture professionals said that they would like a partner organization to report back annually on plant health (Mottern, 2014; Steil, 2014; Tewes-Tyroid, 2014). Steil explained that he would want an annual report because roses frequently do not survive winters (Steil, 2014). Michener offered a dissenting voice, saying that he would want a report every three to five years. He is concerned about who would input data, how it would be used, and general “data overload” (Michener, 2014).

Non-profit organizations were receptive to the idea of annual reporting if the process was not too complicated or involved too much staff time (Appendix H). Fields said that annual or bi-annual communication between the Society and the botanical garden or arboretum would be very important for program continuity. Some organizations deal with seasonal workforces and changing employees and volunteers, which can hinder a program. Regular communication assists in keeping the program in the minds of staff and therefore helps to keep records current (Fields, 2014). Shahan

suggested an automatic email to serve as a reminder to complete records or to contact the donor institution (Shahan, 2014).

It is the onus of the giving institution, the organization with the most vested interests, to make sure that complete and up-to-date records are kept. Anisko explained “It starts with you. You need to keep as good of records as you need because it’s not really something that everybody does” (Anisko, 2014). When asked what is the most important part of his exchange program, Johnson replied “Our records here” (Johnson, 2014). If records are not kept at the home institution, the knowledge of the program and where plants have been dispersed will be lost when employees leave or there is change in administration.

Record keeping should be kept simple and straight-forward for both parties. Michener cautioned, “The critical element is to reduce the documentation standards to the smallest number of elements so that they are recorded; long lists of interesting attributes might only dilute the work effort” (Michener, 2011). Interviews supported this assertion. Ward said, “If the documentation is too cumbersome, we might choose not to accept it” (Ward, 2014). Fields said that record keeping presented another obligation which is hard in a small organization (Fields, 2014). Gleaves explained,

We don’t have tight records. Some of the distributors of these plants would probably be frustrated, but yet we can’t be expected to do the kind of record keeping they do. There’s got to be some type of middle ground. We have to be held responsible for keeping track of the plant, but not quite to the same standards of the donor organization.

Record keeping should be discussed before an agreement is made between organizations. “As long as a gift came in, I think we could certainly document how it’s doing, as long as we had the protocol in place to do it. [We want] to understand at the time we receive it what the expectations were and how we would execute the documentation” (Ward, 2014).

What information needs to be recorded or tracked on each plant depends on the goals of the public horticulture institution. There are three different sets of data that need to be recorded. The first is the basic identification data kept by the original or donor organization. Most importantly, the public horticulture institution needs to know where it has distributed plants, what it has distributed, and when a specimen was dispersed. Even with just that small amount of information, more than one interview subject told a story of having been able to retrieve germplasm, sometimes many years later (Anisko, 2014; Carmichael, 2014). Griffith said that, armed with that information, “We can go from there. We can only trust that they have similar enough record keeping so they would be able to find it” (Griffith, 2014). Although CBG keeps track of distributed plants in an Excel spreadsheet separate from its custom plant records database, Tankersley did not seem to think it was the best practice (Tankersley, 2014). If possible, all accession and distribution information should be stored in the same database or file.

A second set of data should be kept on the health of the plant at the recipient organizations. This data can be as simple as recording if the plant is dead or alive. It may go into further detail about various states of plant health or size of the plant. This data is important so that, if an institution is relying on the dispersed plant as a duplicate, they know if that backup material needs to be replaced or a new backup location found (Richardson, 2014). The second set of data can be stored by the recipient organization or reported to the original institution on a regular basis.

A third set of data must be kept by the recipient organization. The data should include at a minimum what plants were received, when they were received and from whom, and where they are located on the property. To ensure the success of a program, both Richardson and Tankersley believe that keeping track of accession numbers is essential (Richardson, 2014; Tankersley, 2014). Anisko and Tankersley said that, ideally,

the recipient organization would keep track of the donor institution's accession number. In addition, if the recipient gives the plant a new accession number, that information should be shared and stored in the donor organization's database as well (Anisko, 2014; Tankersley, 2014). Plants should not be deleted from the accession records or database if they die or are removed from the property (Frett, 2014).

For recipient organizations that have never kept plant records before or do not have a practice of accessioning items, assistance in setting up a plant records system or database would be beneficial. "Having some sort of database with the other institution's database would be awesome and important. We probably wouldn't need extra staff, but a database...would be really helpful" (Teal-Sullivan, 2014). Symmes said that she would welcome recommendations for fields to put in a spreadsheet file to keep track of data (Symmes, 2014). Communication with the donor organization was welcomed by non-profit interview subjects; some specifically asked for technical support along the way (Shahan, 2014; Teal-Sullivan, 2014).

Correct identification of plants is critical to the success of a program. Symmes said that, for her organization, the most important part of an exchange program would be to have definite identification of plant varieties or cultivars (Symmes, 2014). Steil said, "Especially for things like cultivars, make sure the labels didn't get switched accidentally. We need to know that it is indeed what it is and can trust...based on the verification that happens at that facility or someone else goes out and verifies it." The survey points to the possibility that botanical gardens and arboreta use a combination of approaches or information to verify identities of plants they have given away and then retrieved. Accession information was, however, by far most commonly used.

MBGNA has pioneered the practice of DNA fingerprinting its historic peony cultivars so that, if labels or records are lost, it can still verify the identity of specimens

years into the future. DNA fingerprinting comes with a price, not the least of which is having multiple experts identify each cultivar (Michener, 2014). Johnson explained why DNA fingerprinting can be difficult,

You have to make sure that the camellia we say is ‘Professor Sargent’ is ‘Professor Sargent’... Especially with camellias, with so many look a lot together, with DNA, the problem is that if I pick a limb off a plant and they pull the DNA it becomes that cultivar forever whether it was or not. That’s probably the biggest problem—researching the records to say this is the variety we’re saying it is. And that’s really, really hard.

Verification can be difficult, especially if records have been lost in the past. However, it is essential for plant collections (Gates, 2006).

### **Selectivity**

Public horticulture institutions wishing to distribute part of their collections can be selective of their collaborators. University of California Botanical Garden at Berkeley and San Francisco Botanical Garden, as well as Montgomery Botanical Center and Fairchild Tropical Botanical Garden, have longstanding informal exchange programs because they know of each other’s collections policies and curatorial practices (Carmichael, 2014; Griffith, 2014). Carmichael said of his program in general that he is working with curators of known institutions, where he knows the data will be managed (Carmichael, 2014). Anisko said:

You can be selective of who you give to—only those who have good records, who take good care of their [plants] and will cherish this [plant] for the next hundred years. If you give it to a local school, you know it won’t be labeled and that it will be removed with the next expansion and you will never hear about it. Who you choose to give to makes a big difference in success or failure. (Anisko, 2014)

Richardson explained that he would screen all potential partners before giving them plants. He would learn their reputation and their strengths and weaknesses in terms of caring for collections. He would only give rare plant material to a place that has a

fulltime plant records person or curator (Richardson, 2014). How selective an institution is depends on its goals and objectives with a distribution program. The key to a successful exchange or dispersal program is finding partner organizations that possess similar goals and objectives (Shahan, 2014).

### **Recommendations**

Following ideas put forth in the research, steps can be taken to ensure successful partnerships between organizations. Among the practices that are thought to be valuable for forging long-term partnerships were:

- Publishing a list of plants available on the organization website or emailing to potential partners
- Working with each partner on a case-by-case basis
- Signing a written agreement between both parties
- Committing as an institution to the partnership or program
- Communicating annually between partnering organizations
- Adding information about the partnership or program to collection policies
- Partnering and exchanging resources to benefit both organizations
- Carefully choosing partner organizations

### **Further Research**

American public gardens maintain extensive collections of ornamental plants for quite varied purposes. However, it is not clear what percentage of or what elements of ornamental diversity are well maintained at multiple public horticultural sites, are only preserved in a few collections, or are on the verge of extinction at just one site. Outside public horticultural institutions, plant societies and other interest groups are also involved

in preserving distinct heritage plant selections (the American Daffodil Society, for example, or the Heirloom Flowers Yahoo group). These groups may not, however, have the organizational capacity for living-collection development and stewardship. Further research to determine how societies can be involved in a larger cultivar preservation program would be useful. Additionally, it is recommended that research be conducted to figure out how a list of endangered cultivars can be compiled.

Further study is recommended to determine if it is feasible to create a new branch of a non-profit that would both facilitate the sharing of plants between botanical gardens, arboreta, and other non-profit partners. Ideally, it would serve as a reference point for all parties interested in preserving cultivated plants. Steil said he would like to have a “resource of people who are willing and happy to connect with each other for any issues related to the collection” (Steil, 2014). This ‘branch’ would maintain a website with information about which plants each garden has available to share and also which plants are being sought by both horticulture institutions and other non-profits. If possible, it would allow plant recipients to upload plant records. “To aim for a central repository of data in whatever form is ambitious – but important” (Morris, 2011). It would monitor and publish a “red list” of cultivars most at risk. When a collection is at risk, the non-profit could alert the network of public horticulture institutions and partners. The non-profit could ensure consistent monitoring across all organizations and, therefore, ensure the collection standards. It could also alert the media and publicize partnerships.

Although it is possible that a new non-profit organization could be founded, some experts have expressed the belief that doing so would only further dilute an already stressed base of support. They also expressed the belief that goals to facilitate collaborations and cultivar preservation could fall underneath an established non-profit such as NAPCC, BGCI, or CPC (Allenstein, 2014; Pooler, 2014; Hird, 2014). A



feasibility study would further reach out to staff at different public horticulture organizations, cultural institutions, societies, non-profits, and other stakeholders, to determine levels of awareness and interest. It could also look into funding or revenue streams.

### **Conclusion**

From the current research, we can determine that botanic gardens, arboreta, and other non-profit organizations are interested in collaborating. Current research also shows that the majority of botanical gardens and arboreta have given plants to other public horticulture institutions as well as nurseries and individuals. However, very few gardens have a formalized program for sharing plants. They have policies in place to allow them to give away plants, but there is not an official program to distribute or to track material.

The research shows that there is opportunity for partnerships to be forged between interested parties. No formalized partnerships between a public horticulture institution and a non-profit could be found to participate in this research. The study of such an existing partnership would be useful for reference and serve as a standard that could be built upon. Alternatively, perhaps a small, model partnership could be designed and developed as a research project for further exploration of the topic.

Without an example of a botanic garden/non-profit partnership to benchmark, it will take trial and error to create a successful program to share plants between public horticulture institutions and other non-profits. It is unlikely that a program could be created that will perfectly fit all organizations and all situations. As one interviewee stated, “This is the kind of project that you find out by doing it how we should have done it” (Michener, 2014). The first step is simply a first step. Once one organization decides to reach out and collaborate with another, others will follow suit. Not all partnerships will

be successful and long-term, but the risk of not trying is the risk of losing plants to extinction.

The risk of losing significant cultivars to extinction is a real and significant threat. Climate change, natural disasters, human initiated disasters, new pests and diseases and changing aesthetic tastes and trends are some of the threats facing our horticultural heritage. If we wait until the devastation of the next disaster to motivate us to create partnerships and share resources, we will surely lose cultivars that can be saved if we act now. We must go ahead and disperse plants as we have always done—but now we must take an additional step and find a way to track and record the distribution for the future and for horticultural posterity.

## REFERENCES

- Adams, D. 2004, *Restoring American Gardens: An Encyclopedia of Heirloom Ornamental Plants, 1640-1940*. Timber Press, Portland, Oregon.
- Adams, D. April 12, 2014, Personal Correspondence.
- Anisko, T. March 26, 2014, Personal Interview. Curator of Plants, Longwood Gardens.
- Allenstein, P. February 7, 2013, Personal Correspondence. Manager, North American Plant Collections Consortium.
- Allenstein, P. May 6, 2014, Personal Interview. Manager, North American Plant Collections Consortium.
- American Alliance of Museums. 2004, *The AAM Guide to Collections Planning*. American Alliance of Museums, Washington, DC.
- American Public Gardens Association. April 22, 2014, "What is NAPCC?" APGA [online] available at <http://www.publicgardens.org/napcc>
- Barton, G. 2002, *Empire Forestry and the Origins of Environmentalism*. Cambridge University Press, Cambridge, England.
- Becker, E. April 1, 2014, Personal Interview. Manager of Landscapes, Horticulture, and Modern Facilities, Drayton Hall.
- Bergquist, J. 2009, *The Development of a Natural Disaster Planning Template for Use In Plant Collections Management*. University of Delaware, Newark, DE.
- Blackmore, S. 2006, "Keep or Compost? Where there must be life after research for living collections." *Sibbaldia*, No. 6.
- Bohlin, S. March 24, 2014, Personal Interview. Director, The Andrew Low House.
- Borgen, L., and Guldahl, A. 2011, "Great-granny's Garden: A Living Archive and Sensory Garden." *Biological Conservation* 20, pp. 441-449.
- Botanical Gardens Conservation International (BGCI). 2014, "BGCI U.S. Strategic Plan 2012-2016." BGCI [online] available at <http://www.bgci.org/usa/strategicplan/>

- Botanical Gardens Conservation International (BGCI). 2009, "Hortus Botanicus Vrije Universiteit Threatened With Demolition." BGCI [online] available at <http://www.bgci.org/resources/news/0590/>
- Botanic Gardens Conservation International (BGCI). 2014, "BGCI's achievements." BGCI [online] available at <http://www.bgci.org/global/achievements/>
- Botanische Tuinen. 2014, "Dutch Botanical Gardens Foundation." Botanische Tuinen [online] available at <http://www.botanischetuinen.nl/NVBT.html>
- Caddy, L. March 20, 2014, Personal Interview. Horticulturist, University of Alberta Devonian Botanic Garden.
- Carmichael, C. March 21, 2014, Personal Interview. Associate Director of Collections and Horticulture, University of California Botanical Garden at Berkeley.
- Center for Plant Conservation (CPC). 2014, "Mission." CPC [online] available at <http://www.centerforplantconservation.org/About/Mission/Mission.asp>
- Cincinnati Zoological Society. 2012, "Cincinnati Zoo Awarded National Leadership Grant for Plant Conservation." Zoological Society [online] available at <http://cincinnatizoo.org/blog/2012/09/26/cincinnati-zoo-awarded-national-leadership-grant-for-plant-conservation/>
- Cole, L. April 2, 2014, Personal Interview. Executive Director, Historic Deepwood Estate.
- Coleman, L. 2012, "Coalition Vows To Keep Fighting UCLA Sale Of Hannah Carter Gardens." Beverly Hills Courier [online] available at <http://bhcourier.com/coalition-vows-to-keep-fighting-ucla-sale-of-hannah-carter-gardens/2012/04/06>
- Susan Damon. April 4, 2014, Personal Interview. Nursery Manager, The Fells Historic Estate and Gardens.
- Doug Conley. March 13, 2014, Personal Interview. Director of Landscapes, Edsel and Eleanor Ford House.
- Institute of Museum and Library Services Connecting to Collections. 2009, "It's Alive! Petals to Primates: Preservation Challenges of Living Collections" participant binder. Institute of Museum and Library Services.
- Conservatoire des Collections Végétales Spécialisées (CCVS). 2014, "Objective and role of the CCVS." CCVS [online] available at <http://www.ccvs-france.org/index.php/english>

- Convention on Biological Diversity(CBD). 2014, "Strategic Plan 2011-2020, Aichi Biodiversity Targets." CBD [online] available at <http://www.cbd.int/sp/targets/>
- Cothran, J. 2003, *Gardens and Historic Plants of the Antebellum South*. University of South Carolina Press, Columbia, S.C .
- Creswell, J. 2013, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. SAGE Publications, Inc., Los Angeles, CA.
- Diehl, T. March 25, 2014, Personal Interview. Head of Horticulture, Ladew Topiary Gardens.
- Dobrzynski, J. July 26, 2010, "Botanical Gardens Look for New Lures." New York Times [online] available at <http://www.nytimes.com/2010/07/27/us/27botanical.html>
- Dosmann, M. 2012, "Climate Change and Collections." *Public Garden*, vol. 27, Summer/Fall, pp.28-29. APGA [online] available at <http://www.publicgardens.org/files/images/2012Vol2-3/index.html>
- Evans, M. January 13, 2014, "World's smallest water lily stolen from Kew Gardens." The Telegraph [online] available at <http://www.telegraph.co.uk/news/uknews/crime/10569640/Worlds-smallest-water-lily-stolen-from-Kew-Gardens.html>
- Favretti, R. and Favretti, J. 1978, *Landscapes and Gardens for Historic Buildings*. American Association for State and Local History, Nashville, TN.
- Frett, J. April, 2014, Personal Communication. Director, University of Delaware Botanic Gardens.
- Frost, M. September 18, 2013, "Brooklyn Botanic Garden Denies It's Ending Scientific Research." Brooklyn Daily Eagle [online] available at <http://www.brooklyneagle.com/articles/brooklyn-botanic-garden-denies-it%E2%80%99s-ending-scientific-research-2013-09-18-202600>
- Garden Plant Conservation Association of Australia (GPCAA). 2014, "Welcome." GPCAA [online] available at <http://gpcaa.typepad.com/>
- Gates, G. 2006, "Characteristics of an exemplary plant collection." *Public Garden*, vol. 21, no. 1, pp. 28-31.
- Given, D., Brockerhoff, E., and Jonathan Palmer. 2006, "Nationally networked plant collections are a necessity." *New Zealand Garden Journal*, vol. 9, no. 1, pp. 15-18.

- Great Gardens of America Preservation Alliance (GGAPA). GGAPA [online] available at <http://www.greatamericangardensalliance.org/Introduction.htm>
- Gleaves, C. March 28, 2014, Personal Interview. Director, Kingwood Center.
- Amy Graham. April 2, 2014, Personal Interview. Head Gardener, Longue Vue House and Gardens.
- Griffith, P. March 14, 2014, Personal Interview. Executive Director, Montgomery Botanical Center.
- Gross, M. March 21, 201, Personal Interview. Director, Sister Mary Grace Burns Arboretum, Georgian Court University.
- Gunn, S. 2008, "NCCPG: 30 years of plant collections." *The Plantsman*, vol. 7, no. 2, pp. 88-91.
- Hammett, K. 2009, "A plant breeder's perspective." *New Zealand Garden Journal*, vol. 12, no. 2, pp. 2-3.
- Hastings-Silver, K. March 31, 2014, Personal Interview. Preservation Manager, Lyndhurst.
- Hoare, J. 2006, "The NCCPG Demeter database." *The Plantsman*, vol. 5, no. 3, pp. 174-177.
- Hohn, T. 2008, *Curatorial Practices for Botanical Gardens*. AltaMira Press, Lanham, MD.
- Johnson, T. May 19, 2014, Personal Interview. Director of Gardens, Magnolia Plantation and Gardens.
- Kunst, S. 2013, "Last Chance Dahlias: Order Now Before We Drop Them Forever." *Old Bulbs Gazette* [online] available at <http://www.oldhousegardens.com/news/Feb13.html>
- Lakeland, R. 2008, "Conserving hardy plants." *The Plantsman*, vol. 7, no. 3, pp. 166-169.
- Leguil, S. April 9, 2014, Personal Interview. Threatened Plants Project Coordinator, Plant Heritage.
- Leijenhorst, L. 2011, "Alan Shipp's Chorus Line—U.K. National Hyacinth Collection." *Het Schrijflokaal* [online] available at [http://www.hetschrijflokaal.nl/index.php?id=62&no\\_cache=1&tx\\_ttnews\[tt\\_news\]=159&tx\\_ttnews\[backPid\]=90&cHash=2c48cfeecb](http://www.hetschrijflokaal.nl/index.php?id=62&no_cache=1&tx_ttnews[tt_news]=159&tx_ttnews[backPid]=90&cHash=2c48cfeecb)

- Lynch, J. June 5, 2013, "Vandals take axe to Botanic Gardens." The Age [online] available at <http://www.theage.com.au/victoria/vandals-take-axe-to-botanic-gardens-20130605-2nq2j.html>
- McCarthy, M. June 26, 2010, "World's biggest collection of berries and fruits faces axe." The Independent [online] available at <http://www.independent.co.uk/environment/nature/worlds-biggest-collection-of-berries-and-fruits-faces-axe-2011015.html>
- Michener, D. 2011, "Collections Management." In: Rakow, D. and Lee, S., ed. 2011. *Public Garden Management*. John Wiley & Sons, Inc., Hoboken, NJ. Ch. 19.
- Michener, D. 2012, Personal Communication. Associate Curator, Matthaei Botanical Gardens and Nichols Arboretum, University of Michigan.
- Michener, David. 2013, Personal Communication. Associate Curator, Matthaei Botanical Gardens and Nichols Arboretum, University of Michigan.
- Michener, David. April 4, 2014. Personal Interview. Associate Curator, Matthaei Botanical Gardens and Nichols Arboretum, University of Michigan.
- Morris, M. 2011, *An Assessment of the Conservation Work of Plant Heritage From an International Perspective*. Royal Horticultural Society, London, England.
- Morris, Mercy, et al. "Prioritisation for the conservation of cultivated plants—a new approach." *Sibbaldia*, No. 8. Edinburgh, Scotland: Royal Botanic Garden Edinburgh, 2010.
- Mottern, R. March 14, 2014, Personal Interview. Director of Horticulture. Sarah P. Duke Gardens.
- National Council for the Conservation of Plants and Gardens (Plant Heritage). 2013, "Why Conserve Plants?" Plant Heritage [online] available at <http://www.nccpg.com/About-us/Why-Conserve-Plants.aspx>
- National Park Service (NPS). 2015, "The Secretary of the Interior's Standards for Treatment of Historic Properties." NPS [online] available at <http://www.nps.gov/tps/standards.htm>
- National Park Service (NPS). 1996, "The Guidelines for the Treatment of Cultural Landscapes. National Park Service." NPS [online] available at <http://www.nps.gov/tps/standards/four-treatments/landscape-guidelines/index.htm>

- National Park Service (NPS). 1995, "Four approaches to the treatment of historic properties." NPS [online] available at <http://www.nps.gov/tps/standards/four-treatments.htm>
- Plant Heritage. Winter 2012/2013, "Plant Heritage NCH News." Plant Heritage [online] available at <http://www.nccpg.com/Conservation-resources/NCH-news/NCH-news-Winter-2012-13.aspx>
- Netzwerk Pflanzen Sammlungen (NPS). NPS [online] available at <http://www.netzwerkpflanzen-sammlungen.de/>
- Newcomb, Peggy. 1985, *Popular Annuals of Eastern North America 1865-1914*. Dumbarton Oaks, Washington, D.C.
- North American Plant Collections Consortium (NAPCC). "What is NAPCC?" NAPCC [online] available at <http://www.publicgardens.org/napcc>
- Peltola, R. 2008, "The Midsummer Peony of Finland." *The Plantsman*, vol. 7, no. 2, pp. 114-117.
- Plant Heritage. 2008, *National Plant Collection Holders' Handbook*. Plant Heritage [online] available at <http://www.nccpg.com/Conservation-resources/NCH-Handbook-2008.aspx>
- Planten Collecties (NPC). 2014, "Welkom bij de NPC." NPC [online] available at <http://plantencollecties.nl/Home/999>
- Pogrebin, R. January 21, 2009, "In New York, Proposed Budget Shuts Out Zoos, Aquariums and Gardens." New York Times [online] available at [http://www.nytimes.com/2009/01/22/nyregion/22funding.html?\\_r=0](http://www.nytimes.com/2009/01/22/nyregion/22funding.html?_r=0)
- Putman, C. May 10, 2013, "Newport police investigate poisoned trees." NBC10 [online] available at <http://newportarboretum.org/home/2013/newport-trees-poisoned/>
- Rakow, D. and Lee, S. ed. 2011, *Public Garden Management*. John Wiley & Sons, Inc., Hoboken, NJ.
- Reibel, D. 2008, *Registration Methods for the Small Museum*. AltaMira Press, Lanham, MD.
- Richardson, M. March 21, 2014, Personal Interview. Director of Horticulture, Garden in the Woods.
- Roberts, L. March 26, 2014, Personal Interview. Garden Manager, Van Vleck House and Gardens.



- Royal Horticultural Society and Plant Heritage. 2007, "Action Plan for Conservation of Plants in Cultivation".
- Segraves, M. April 26, 2011, "National Arboretum Exhibits Might Fall to Budget Cuts." ABC7 [online] available at <http://www.wjla.com/articles/2011/04/natl-arboretum-exhibit-may-fall-to-budget-cuts-59494.html>
- Seymour, K. 2012, "Conserving Cultivars." *The Plantsman*, vol. 11, no. 3, pp. 154-159. Plant Heritage [online] available at <http://www.nccpg.com/Conservation-resources/TPP/Conserving-cultivars-Plantsman-September-2012.aspx>
- Shahan, T. March 25, 2014, Personal Interview. Director, Newlin Grist Mill.
- Sole, D. 2009, "Botanic Gardens and Horticultural Perspectives." *New Zealand Garden Journal*, vol. 12, no. 2, pp. 4-5. RNZIH [online] available at [http://www.rnzih.org.nz/RNZIH\\_Journal/Pages\\_4-5\\_from\\_2009\\_Vol12\\_No2.pdf](http://www.rnzih.org.nz/RNZIH_Journal/Pages_4-5_from_2009_Vol12_No2.pdf)
- Teal-Sullivan, Q. March 28, 2014, Personal Interview. Garden Manager, Meadowburn Farm.
- Teal-Sullivan, Q. 2013, *A Preservation Proposal for Helena Rutherford Ely's Garden at Meadowburn Farm*. University of Delaware, Newark, DE.
- Tewes-Tyrolt, M. March 14, 2014, Personal Interview. Horticulture Director, The University of Utah Red Butte Garden.
- Thorton-Wood, S. 2006, "Challenges for the future..." *The Plantsman*, vol. 5, no. 1, pp. 17-21.
- Tucker, A. April 12, 2014, Personal Correspondence. Co-Director, Claude E. Phillips Herbarium, Delaware State University.
- Tyler, N. 2009, *Historic Preservation: An Introduction to Its History, Principles, and Practice*. W. W. Norton & Company, New York, NY.
- Upson, T. 2013, "Plant Heritage: Where Has It Come From and Where Is It Going?" *The Plantsman*, vol. 12, no. 2, pp. 78-83
- Ward, C. April 7, 2014, Personal Interview. Superintendent for the Trustees Ipswich, The Trustees of Reservations.
- Wilkinson, E. December 10, 2009, "Rare conifer cut down in Seattle Arboretum." King 5 News [online] available at <http://www.king5.com/news/local/Rare-conifer-cut-down-in-Seattle-Arboretum-78977067.html>
- Wilson, R. April 2, 2014, Personal Interview. Executive Director, Old Swedes Church.

## Appendix

**Appendix A**  
**IRB DOCUMENTS**

***Certification of Training  
Human Subjects in Research***

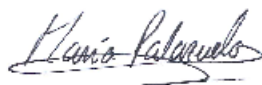
*The University of Delaware certifies that* Lindsey Kerr  
attended an institutional training session on the use of human subjects in research on

February 14, 2019.  
(Date)

The session included the following topics:

- The Belmont Report
- Federal regulations for using humans in research (45 CFR 46)
- The University's Federalwide Assurance
- Informed consent
- Institutional procedures
- Sources for additional information.

 **COPY**



Maria Palazuelos, PhD  
Director of Compliance

Research Office  
University of Delaware  
Newark DE 19716  
302-831-2137



RESEARCH OFFICE

210 Halliham Hall  
University of Delaware  
Newark, Delaware 19716-1551  
Ph: 302/831-2136  
Fax: 302/831-2828

DATE: July 8, 2013

TO: Lindsey Kerr  
FROM: University of Delaware IRB

STUDY TITLE: [488012-1] Herbaceous plant collections survey

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS  
DECISION DATE: July 8, 2013

REVIEW CATEGORY: Exemption category # 2

Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Jody-Lynn Berg at (302) 831-1119 or [jlberg@udel.edu](mailto:jlberg@udel.edu). Please include your study title and reference number in all correspondence with this office.



RESEARCH OFFICE

210 Halliham Hall  
University of Delaware  
Newark, Delaware 19716-1551  
Ph: 302/831-2136  
Fax: 302/831-2828

DATE: September 6, 2013

TO: Lindsey Kerr  
FROM: University of Delaware IRB

STUDY TITLE: [507854-1] Herbaceous plant collections survey for museums and non-profits

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS  
DECISION DATE: September 5, 2013

REVIEW CATEGORY: Exemption category # 2

Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Nicole Farnese-McFarlane at (302) 831-1119 or [nicolefm@udel.edu](mailto:nicolefm@udel.edu). Please include your study title and reference number in all correspondence with this office.



RESEARCH OFFICE

210 Halliham Hall  
University of Delaware  
Newark, Delaware 19716-1551  
Ph: 302/831-2136  
Fax: 302/831-2828

DATE: January 31, 2014

TO: Lindsey Kerr  
FROM: University of Delaware IRB

STUDY TITLE: [527343-1] Interview questions for horticulture professionals

SUBMISSION TYPE: New Project

ACTION: APPROVED  
APPROVAL DATE: January 31, 2014  
EXPIRATION DATE: January 30, 2015  
REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category # 6, 7

Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All sponsor reporting requirements should also be followed.

Please report all NON-COMPLIANCE issues or COMPLAINTS regarding this study to this office.

Please note that all research records must be retained for a minimum of three years.

Based on the risks, this project requires Continuing Review by this office on an annual basis. Please use the appropriate renewal forms for this procedure.



RESEARCH OFFICE

210 Halliham Hall  
University of Delaware  
Newark, Delaware 19716-1551  
Ph: 302/831-2136  
Fax: 302/831-2828

DATE: January 28, 2014

TO: Lindsey Kerr  
FROM: University of Delaware IRB

STUDY TITLE: [564843-1] Interview questions for non-profit and museum professionals

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS  
DECISION DATE: January 28, 2014

REVIEW CATEGORY: Exemption category # 2

Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Nicole Farnese-McFarlane at (302) 831-1119 or [nicolefm@udel.edu](mailto:nicolefm@udel.edu). Please include your study title and reference number in all correspondence with this office.

cc:



## Appendix B

### SURVEY I RESULTS



#### Survey I Results

Last Modified: 01/26/2014

**1. After reading the above description, does your garden hold one or more special collections of plants? Collections do not need to be "historic" to be considered "special."**

#	Answer		Response	%
1	Yes		58	82%
2	No		13	18%
	Total		71	100%






**2. Are these plants accessioned?**

#	Answer		Response	%
1	Yes		51	86%
2	No		8	14%
	Total		59	100%

**3. Is your garden a holder of an NAPCC collection?**

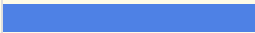



#	Answer		Response	%
1	Yes		29	49%
2	No		30	51%
	Total		59	100%

**4. How long have you had an NAPCC collection?**

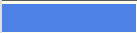

#	Answer		Response	%
1	less than 1 year		3	11%
2	1-3 years		3	11%
3	3-5 years		6	22%
4	5-10		10	37%
5	10+		5	19%
	Total		27	100%





**7. Where is your back up (duplicate) collection located? Check all that apply.**

#	Answer		Response	%
1	At the same site		5	71%
2	Miles away, but on property owned by the same institution		3	43%
3	Miles away, on property owned by someone else		3	43%
4	In a tissue bank		2	29%



**8. Have you stored seeds or tissue from your plants?**

#	Answer		Response	%
1	Yes		15	28%
2	No		38	72%
	Total		53	100%



**9. Do you have a collection of herbaceous perennials?**

#	Answer		Response	%
1	Yes		41	79%
2	No		11	21%
	Total		52	100%

**10. Do you have a collection of perennial plants that must be reproduced by cloning and/or traditional vegetative reproduction?**

#	Answer		Response	%
1	Yes		33	63%
2	No		19	37%
	Total		52	100%







**11. Do you have a collection that includes cultivars?**

#	Answer		Response	%
1	Yes		47	92%
2	No		4	8%
	Total		51	100%

**12. Have you distributed specimens from your collection(s) to other gardens/arboretums/organizations for any reason?**

#	Answer		Response	%
1	Yes		36	68%
2	No		17	32%
	Total		53	100%

**13. What type of garden have you sent them to? Check all that apply.**



#	Answer		Response	%
1	NAPCC site		18	51%
2	APGA member site		29	83%
3	International site		21	60%
4	Non-APGA botanical garden or arboretum		23	66%
5	Not sure (describe if you wish)		2	6%
6	Other		11	31%

Not sure (describe if you wish)	Other
university	
We have shared our antique roses with the Heritage Rose Foundation in its plantings throughout Harlem.	We sell about 1,000 rooted cuttings from our antique rose collection each year to an enthusiastic public.
	seed exchanges
	nurseries, individuals
	academic
	USDA GRIN collection
	Nursery
	nursery owners
	private collectors
	Private
	Any other not-for-profit that has requested material
	Nurseries, individuals


#### 14. Do you have any program in place to distribute plants from your collection?

#	Answer		Response	%
1	Yes		16	46%
2	No		19	54%
	Total		35	100%



#### 15. Does your institution have a written protocol for distribution?

#	Answer		Response	%
1	Yes		19	54%
2	No		16	46%
	Total		35	100%






#### 16. Do you keep track of where you have sent plants?

#	Answer		Response	%
1	Yes		28	80%
2	No		7	20%
	Total		35	100%

#### 17. Do you keep track of the condition of plants once they have reached the recipient's garden?

#	Answer		Response	%
1	Yes		2	6%
2	No		33	94%
	Total		35	100%

#### 18. How do you keep track of specimens you have distributed? Check all that apply.

#	Answer		Response	%
1	Database		23	74%
2	On-site visits		3	10%
3	Photographs		3	10%
4	DNA fingerprinting		0	0%
5	Duplicate accession tags		2	6%
6	Other		7	23%

#### Other

digital file

email queries

excell



We don't keep track of them

primarily sent to nursery owners for propagation and sale of rare species or cultivars

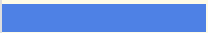

Historically specimens were not tracked. However recently (the end of 2012), we track in a database.

spreadsheet

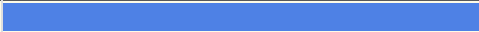
#### 19. Do you have follow up plans to monitor plant survival rate once distributed?

#	Answer		Response	%
1	Yes		2	6%
2	No		33	94%
	Total		35	100%






**20. Have you ever needed to retrieve plant material that you have distributed?**

#	Answer		Response	%
1	Yes		15	43%
2	No		20	57%
	Total		35	100%

**21. Were you able to successfully retrieve the plant(s)?**

#	Answer		Response	%
1	Yes		14	100%
2	No		0	0%
	Total		14	100%

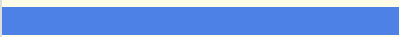

**22. How did you know it was the correct plant(s)?**

#	Answer		Response	%
1	DNA fingerprint		0	0%
2	Expert verification		7	50%
3	Trusted assurance of staff horticulturist		6	43%
4	Accession information		12	86%
5	Other		1	7%

**Other**

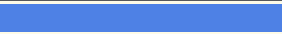

crosslisted accession numbers

### 23. Do you think your garden's program of distributing plants has been successful?

#	Answer		Response	%
1	Yes. Comment if you wish.		25	83%
2	No. Comment if you wish.		5	17%
	Total		30	100%

Yes. Comment if you wish.	No. Comment if you wish.
It is not a codified plan, but we do track who asks for what, so we know where to get them back.	I guess the answer is no, because we don't have a program in place
We have only distributed acorns from our hybrid Oak collection	We don't distribute plants as "backups", but thinking about this in the future.
Our Hemerocalis collection has been shared with other public gardens	
Many of these questions need more than a yes/no answer	
Some aspects are successful, but there is great room for improvement. I would have selected both Yes and No on this one!	
My response is really "Unsure," as we have no strict definition of "success." However, it is certainly not a failure.	
We have no official program. However we do have quite a few unusual plants that I trade with nurserymen for rare plants they have.	
I definitely think so! A good case study on this is Microcycas calocoma. Distribution of collections helps out in so many ways. There is a paper in HortTechnology (2011) by Kay et al. on this. However, this is not an herbaceous perennial, it is a woody plant. One more comment -- sorry it took me so long to respond.	
but it's getting harder and harder	

**24. Would you be willing to participate in a personal interview about cultivar preservation and plant distribution?**

#	Answer		Response	%
1	No		29	59%
2	Yes. Please provide contact information in the space below.		20	41%
	Total		49	100%

Yes. Please provide contact information in the space below.

clematis@ipns.com (collection curator)

Marita Tewes Tyrolt, (801) 585-5226

Stephen Jackson, Mt Auburn Cemetery, 617-607-1914 sjackson@mountauburn.org

tony@plantdelights.com

mweathi@ncsu.edu

Mark Richardson - mrichardson@newenglandwild.org, 508.877.7630

btankers@chicagobotanic.org

Aaron Steil - ajsteil@iastate.edu

mfh6@cornell.edu

Chris Carmichael, UC Botanical Garden at Berkeley; carmichl@berkeley.edu please note that UCBG does not maintain or distribute cultivars. We do distribute wild-origin material for various reasons.

bobby mottern 919 668 1700 bobby.mottern@duke.edu

Todd Jacobson Head of Horticulture, The Morton Arboretum 630-719-7933

jtboland@mun.ca

dconley@fordhouse.org

We don't really have any specific collections - but we have displays with hundreds of perennials - Art Cameron 517-355-5191 ext 1338

Laura Caddy, Horticulturist/Curator, Patrick Seymour Alpine Garden, Plant Documentation Manager, University of Alberta Devonian Botanic Garden, Phone: 780 987 3054 ext. 2234 Email: lcaddy@ualberta.ca

patrick@montgomerybotanical.org

Michael Dosmann

Robert Cubey Plant Records Officer, Royal Botanic Garden, Edinburgh, 20a Inverleith Row, Edinburgh, EH3 5LR Tel: 0131 552 7171 Fax: 0131 248 2901 Direct: 0131 248 2948

Mark\_weathington@ncsu.edu



## Appendix C

### SURVEY II RESULTS


#### Survey II Results

Last Modified: 04/21/2014



##### 1. Does your place of employment own the land around it?

#	Answer		Response	%
1	Yes		98	89%
2	No		12	11%
	Total		110	100%



##### 2. Do you grow trees, shrubs, or flowers on the property?

#	Answer		Response	%
1	Yes		97	100%
2	No		0	0%
	Total		97	100%



##### 3. Do you keep records of the plants on your property?

#	Answer		Response	%
1	Yes		75	79%
2	No		20	21%
	Total		95	100%



##### 4. Do you employ someone to take care of the property?

#	Answer		Response	%
1	Yes		83	87%
2	No		12	13%
	Total		95	100%







##### 5. Do you have a professional horticulturist on staff?

#	Answer		Response	%
1	Yes		46	48%
2	No		49	52%
	Total		95	100%

### 6. Do you have volunteers who help care for the property?

#	Answer		Response	%
1	Yes		80	85%
2	No		14	15%
	Total		94	100%

### 7. Do you work for a:

#	Answer		Response	%
1	Living history museum or farm		9	10%
2	Historic site (historic house museum, cemetery, park)		54	58%
3	Any other museum type		3	3%
4	Other non-profit (historical society, garden club, scouts)		5	5%
5	Botanical garden or arboretum		13	14%
6	Any other than those listed above		9	10%
	Total		93	100%

#### Any other than those listed above

non-profit historic house and garden

Landscape laboratory on historic site

Display Garden

Historical society with 2 historic houses & gardens

We have both a general Museum and two historic house museums.

botanical garden with historic house




decorative art museum and garden

a conservation organization which has a historic home on the property as well as an Heirloom garden designed to protect Heirloom plants.



public garden





**8. Would your institution be interested in receiving plants from a botanical garden or arboretum?**

#	Answer		Response	%
1	Yes		65	70%
2	No		5	5%
3	Unsure		23	25%
	Total		93	100%



**9. Would you be more likely to accept plants if they were historic, appropriate for your period of significance, or relevant to your organization's mission?**

#	Answer		Response	%
1	Yes		86	92%
2	No		7	8%
	Total		93	100%



**10. Should you receive plants, would someone at your organization be able to care for them?**

#	Answer		Response	%
1	Yes		82	95%
2	No		4	5%
	Total		86	100%

**11. Would the primary person be an employee?**

#	Answer		Response	%
1	Yes		59	72%
2	No		23	28%
	Total		82	100%

**12. Would the primary person be a volunteer?**

#	Answer		Response	%
1	Yes		22	29%
2	No		55	71%
	Total		77	100%

### 13. If neither an employee nor a volunteer, then who?

#### Text Response

City based park staff contracted for land management  
 We contract the garden maintenance to a horticultural firm, who have several professionals on staff (separate from the groundskeeping staff)  
 This a hybrid Caretaker/Resident Curatorship with a family living onsite and volunteers and occasional assistance of State horticulturalist.  
 Landscape professional who cares for the garden  
 Likely a combination of a volunteer and an employee/board member (very small organization!)  
 It would depend on plants or trees and location on property. Labor is divided between employees & volunteers.  
 part-time hourly consyltant  
 we have a landscape service as well as volunteers  
 maybe

### 14. Would your institution be willing to pay a nominal fee for plants?





#	Answer		Response	%
1	Yes		30	35%
2	No		12	14%
3	Unsure		43	51%
	Total		85	100%

### 15. If you received plants, would you be willing to report on the health of the plants to the donor organization?

#	Answer		Response	%
1	Yes		69	81%
2	No		3	4%
3	Unsure (please explain)		13	15%
	Total		85	100%

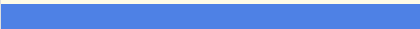




Unsure (please explain)
would need to check with parent organization; it would be helpful to have a form of some sort to use for efficiency
The gardens are overseen primarily by a volunteer Trustee committee who makes major decisions about the plants and their maintenance.
depends on terms of gift
Reporting for a set period of time...not indefinite
We have never done anything like this before.
It would depend on the time commitment.
depends on value of plant/how much time it would take
would be willing to notify if plant has died but would not want to do an annual report.
Would depend requirements but some standard of reporting would be expected.
not up to me
It depends on how cumbersome the reporting would be.
We have a very lean staff. We would report if / when time permits.
volunteer based

#### 16. How often would you be willing to report on the health of the plants?

#	Answer		Response	%
1	Annually		56	72%
2	Every 2 years		12	15%
3	Every 5 years		2	3%
4	Every 5+ years		0	0%
5	Other		8	10%
	Total		78	100%

Other
Frequency would depend on the required extent of the report .
see previous - volunteer board committee oversees the plant and gardens care/maintenance.
unlikely to accept if such conditions.
Depends on what is required to be reported and the time involved. A one to two year period would be ideal unless we are documenting trees
Every 2-5 years or as required
only upon death of plant
do not know

**17. From the report components listed below, which would you be willing to provide on a periodic basis? Please check all that apply.**

#	Answer		Response	%
1	Descriptive text		67	88%
2	Photographs		65	86%
3	Oral report by phone		41	54%
4	Drawings/sketches/maps		12	16%
5	Other		5	7%

**Other**

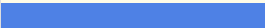




none

bg-base record text

by email



?

**18. What types of plants would you be interested in receiving? Check all that apply.**




#	Answer		Response	%
1	Trees		44	56%
2	Shrubs/bushes (e.g. roses, lilacs, azaleas)		63	80%
3	Herbaceous perennials/plants that come back every year (e.g. peonies, daylilies, iris)		69	87%
4	Bulbs (e.g. tulips, daffodils, crocus, spider lilies)		61	77%
5	Other		11	14%

Other
We would be more likely to export than to receive
dye plants, medicinal herbs
heirloom vegetables and flowers in seed or plant form.
Any that are significant to the historic landscape
fruiting trees or bushes
document plants from wild populations
plants within our botanical collection definition
California native plants
It would depend on how they fit into our landscape and interpretive plans
Annuals
ferns

**19. To your knowledge, has your institution ever received plants from a botanical garden (or similar institution)?**

#	Answer		Response	%
1	Yes		31	39%
2	No		48	61%
	Total		79	100%

**20. Would you be interested in participating in a program that seeks to preserve historic or heirloom plants?**

#	Answer		Response	%
1	Yes		61	76%
2	No		2	3%
3	Unsure		17	21%
	Total		80	100%

## 21. What are the obstacles that prevent you from participating?

### Text Response

staffing

design intent

Record keeping, implied obligations that are inconsistent with our mission.

the question doesn't make sense to me. There are many programs to preserve plant species out there. But your questions seem to focus on preservation of individual plants which is more like 'historic tree' programs. Those aren't generally sent to other places.

Unsure the level of staff time required for participation.

Lack of staff to keep up with

Unsure of what the participation would entail so unable to make a decision at this time.

Time

interest from the board of directors.

Small staff, county owned, not much support

We have a 200 acre site that has a large deer habitat.

Need to discuss with property committee and board before making a final commitment.

Very interested in participating.



Not having a staff member well-versed in horticulture.

In what? Reporting or accepting or paying?

The main obstacle is the lack of staff. We no longer have a curatorial focus with staff assigned to individual garden areas. We have the equivalent of three full time staff who maintain the gardens, teach and do set up /break down for a brisk schedule of garden events.

I am unable to make that decision for the organization

## 22. Does your institution already participate in a plant preservation program?

#	Answer		Response	%
1	Yes		4	21%
2	No		15	79%
	Total		19	100%

## 23. Please describe the type of program in place.

### Text Response

I manage a 100 acre country estate with high maintenance gardens that we try to keep filled with heirloom perennials



We preserve native species of plants on our site. We have legal restrictions from the city regarding tree removal for example.

NAPCC oak collection

We ave a gardenesque landscape maintained by a horticulturist

We preserve collections of plants historic and non-historic that are important to Longwoods mission. I am not sure of any other preservation initiatives that Longwood participates in.

**24. Would you be interested in participating in an interview about this topic?**

#	Answer		Response	%
1	Yes. Please provide your contact information in the space below.		51	64%
2	No		29	36%
	Total		80	100%

Yes. Please provide your contact information in the space below.

ronkley@juno.com

Ann Culek 614-834-4979

Barbara Corson, hooftales@msn.com

Elaina Carlisle, Education Assistant, Dallas Heritage Village 214-413-3669

Michael Gross, 732-987-2373 or grossm@georgian.edu, Sister Mary Grace Burns Arboretum of Georgian Court University, 900 Lakewood Ave, Lakewood, NJ, 08701

Dena Kirk ckirk@nccde.org

Catherine Fields, Litchfield Historical Society 860-567-4501, cfields@litchfieldhistoricalsociety.org

bellamy.ferriday@ctlandmarks.org Kristin Havill

Amy Kinsey, Landscape Curator, George Eastman House, 900 East Avenue, Rochester, NY 14607, 585 271-3361 x224, akinsey@geh.org

sbent@monmouthcountyparks.com

sbohlin@andrewlowhouse.com / Stephen Bohlin, Director Andrew Low House 912-233-1828

Brian Barr, Director of Horticulture, Hillwood Estate Museum & Gardens

Chris Ward, cward@ttor.org, 978-356-4351 ext 4034

Michele Anstine, Asst CEO Delaware Historical Society, manstine@dehistory.org, 302-295-1002

Eleanor Cunningham, Site Director, Gaineswood National Historic Landmark, 334-289-4846, gaineswd@bellsouth.net

Carrie Fellows, Exec. Dir., Macculloch Hall Historical Museum

cfellows@maccullochhall.org 973.538.2404x11

Tyler Diehl. tylerd@ladewgardens.com

kblock@ttor.org

Halebyrneshouse@aol.com

Mpeterschmidt@Stratfordhall.org

sheiljones@aol.com

Barbara Miller, 504 Summit DR. Hockessin, de. 19707 302-239-4349

Eric Becker, Drayton Hall, 3380 Ashley River Rd., Charleston, SC 29414 email:

ebecker@draytonhall.org

slang@girlscouts.org

Deanna Berkemeier, Lead Interpreter for Domestic Skills: 585-294-8278:

dberkemeier@gcv.org

hrpeden@comcast.net  
 ldanek@plimoth.org  
 Marsha Bode, volunteer, 949 244-2010  
 sandra beale elfshole@mac.com head of ARASAPHA GARDEN CLUB, New  
 Castle, DE garden committee  
 302-651-4912  
 austindodson@gmail.com  
 Leirhart@winterthur.org 302-888-4825  
 Tony Shahan, Newlin Grist Mill, 219 S. Cheyney Road, Glen Mills, PA 19342 610-459-  
 2359 tshahan@newlingristmill.org  
 Rockwood Museum c/o Judy Fiipkowski 302-656-0409 (Board of the Friends of  
 Rockwood)  
 912 790-8840  
 I do have some questions that this survey did not address. Erica Armour -215-295-6567  
 johnnye.baker@historicodessa.org  
 Lois Cole 503 363-1825  
 Rebecca Wilson, 302-652-5629, email rlwilson@oldswedes.org  
 Tel; 305-860-8430; e: ian.simpkins@vizcaya.org  
 Krystyn Hastings-Silver khsilver@comcast.net  
 205.965.6611 rweaver@aldrigegardens.com  
 Kyle Cheesborough, kcheesborough@bellefontainecemetery.org  
 Ebelk@wyck.org  
 Maria Pacheco-West flyingwindflower@gmail.com 334-285-4550  
 david@brucemore.org or (319) 362-7375  
 caroline Burgess, garden@stonecrop.org  
 jdonahue@newportmansions.org  
 rreitz@fernwoodbotanical.org  
 John.lamb@bellemeadeplantation.com



## **Appendix D**

### **LIST OF ALL INTERVIEW SUBJECTS**

#### **Botanical Gardens and Arboreta**

1. Dr. Tomasz Anisko. Curator of Plants. Longwood Gardens.
2. Laura Caddy. Horticulturist. University of Alberta Devonian Botanic Garden.
3. Dr. Christopher Carmichael. Associate Director of Collections and Horticulture. University of California Botanical Garden at Berkeley.
4. Dr. Patrick Griffith. Executive Director. Montgomery Botanical Center.
5. Dr. Michael Gross. Director. Sister Mary Grace Burns Arboretum.
6. Mary Hirshfeld. Director of Horticulture. Cornell Plantations.
7. Dr. David Michener. Associate Curator. Matthaei Botanical Gardens and Nichols Arboretum at the University of Michigan.
8. Robert Mottern. Director of Horticulture. Sarah P. Duke Gardens.
9. Mark Richardson. Director of Horticulture. Garden in the Woods.
10. Aaron Steil. Manager of Public Programs. Reiman Gardens at Iowa State University.
11. Boyce Tankersley. Director of Living Plant Documentation. Chicago Botanic Garden.
12. Marita Tewes-Tyrolt. Horticulture Director. The University of Utah Red Butte Garden.

#### **Other Non-profits and Cultural Institutions**

1. Eric Becker. Manager of Landscapes, Horticulture, and Modern Facilities. Drayton Hall.

2. Stephen Bohlin. Director. The Andrew Low House.
3. Lois Cole. Executive Director. Historic Deepwood Estate.
4. Kyle Cheesborough. Horticulturist. Bellefontaine Cemetery and Arboretum.
5. Doug Conley. Director of Landscapes. Edsel and Eleanor Ford House.
6. Susan Damon. Nursery Manager. The Fells Historic Estate and Gardens.
7. Tyler Diehl. Head of Horticulture. Ladew Topiary Gardens.
8. Linda Eirhart. Assistant Director of Horticulture. Winterthur Museum, Garden and Library.
9. Cathy Fields. Director. Litchfield Historical Society
10. Chuck Gleaves. Director. Kingwood Center.
11. Amy Graham. Head Gardener. Longue Vue House and Gardens.
12. Krystyn Hastings-Silver. Preservation Manager. Lyndhurst.
13. Tom Johnson. Director of Gardens. Magnolia Plantation and Gardens.
14. Laura Roberts. Garden manager. Van Vleck House and Gardens.
15. Tony Shahan. Director. Newlin Grist Mill.
16. Anne Symmes. Executive Director. Beatrix Farrand Garden Association
17. Quill Teal-Sullivan. Garden Manager. Meadowburn Farm.
18. Chris Ward. Superintendent for the Trustees Ipswich. The Trustees of Reservations.
19. Rebecca Wilson. Executive Director. Old Swedes Church.

### **Plant Conservation Experts**

1. Pam Allenstein. Manager. North American Plant Collections Consortium
2. Abby Hird. Program Director. Botanic Gardens Conservation International U.S.

3. Sophie Liegul. Threatened Plants Project Coordinator. Plant Heritage.
4. Dr. Margaret Pooler. Research Leader. US Department of Agriculture/Agricultural Research Service at the US National Arboretum.

## **Appendix E**

### **INTERVIEW QUESTIONS FOR BOTANIC GARDEN PROFESSIONALS**

The purpose of this project is to write a policy so that it may be used by botanical gardens and arboreta that possess herbaceous perennial collections in order to distribute plant material to other sites and successfully retrieve the same material if the original collection is destroyed. These interview questions seek to understand what botanical gardens or arboretum have done in terms of distributing plant materials, if they have written policies, and how those policies can be improved upon in order to create a successful original plant material distribution program/policy.

Participants may answer as few or as many questions as they wish. The interviews will be audio recorded unless the participant requests no recording. All audio recordings will be destroyed at the end of this project (projected date July 2014). Participant full names will be associated with the interview unless the participant requests that their name be removed.

There should be no risks associated with this interview. The benefit of the interview is the inclusion of the participant's ideas and opinions in the creation of original plant material distribution program/policy.

Do you wish to participate in this interview?

Please check: Yes ☐ No ☐

Do you wish your name to be associated with your interview?

Please check: Yes ☐ No ☐

I understand that this interview will be recorded. All recordings will be destroyed at the completion of this project.

Please check: Yes \_\_\_ No\_\_\_

I do not want my interview to be recorded.

Please check: Yes \_\_\_ No\_\_\_

Are you over the age of 18?

Please check: Yes \_\_\_ No\_\_\_

Questions:

1. Please give your full name.
2. Please give the name of your institution.
3. What is your institution doing to address the risk of loss of material?
4. What type of collection(s) do you have?
5. Which collection(s) do you distribute?
6. Do you have a written plan/policy for plant distribution?
7. Do you distribute cuttings (or other plant material)?
8. How long have you been distributing plants?
9. Why do you distribute plants?
10. Do you charge a fee for plants? If yes, do you think a fee is necessary?
11. How do you think a fee would affect the program?
12. Do you keep track of plants?
  - a. How do you keep track of where you send plants?
13. Do you keep track of the health of the plants?
14. Have you retrieved plants in the past? Why/why not?
15. Do you think your program is successful?
  - a. Does it meet institutional goals? Why or why not?

16. What parts of the program do you think are most important?
17. What parts do you think could use improvement?
18. Have you improved/changed your program in the past to make it more successful?
19. What do you need to ensure the success of the program? What is the minimum amount of information that you need to record *and* that the recipient organization needs to keep track of?
20. How often do you ask a recipient garden to inventory or report back on the plants you gave them?
21. Is the policy/protocol available to anyone?
22. May I have a copy of your policy/program protocol?
23. Have you heard of other distribution programs at other gardens that I should look into?

## **Appendix F**

### **SUMMARIES OF INTERVIEWS WITH BOTANIC GARDEN PROFESSIONALS**

#### **Dr. Tomasz Anisko. Longwood Gardens.**

Dr. Tomasz Anisko is Curator of Plants at Longwood Gardens (LG). LG is located in Kennett Square, Pennsylvania. It was founded in 1906 as a private garden. Today it is over 1,000 acres. LG seeks to inspire people “through excellence in garden design, horticulture, education, and the arts.” As curator of plants, Anisko oversees proper naming and identification of plants, coordinates plant trials and plant distribution programs and leads plant exploration efforts.

LG has been sharing and distributing since 1955 when it became a public garden. “It has always been part of our philosophy—to share what we have.”

LG introduced its first plant collections policy 2-3 years ago. There are two different categories of plants in the collections. Those that are in public domain, they distribute without restriction. They ask the recipient to sign an agreement, which is to protect LG from liability that results from the use of the material. It also assures that proper credit is given to LG if someone should publish results based on research on the material. LG places no restriction on what they can do with the plant, whether they can share the plant. LG does not expect anything in return. LG pays the cost of shipment and does not stipulate conditions like reserving the right to propagate the material in the future, or reports on performance, or inventories every so many years.

Plants that are protected by patents or CBD, LG will not distribute or propagate without permission. For CBD plants, recipients must sign an MTA.

In the past, plants were given to LG with the understanding that LG would report back or tell them if the plants were discarded. The most longstanding program LG is involved in is with the USDA. In the last year or two, they have had to remove a tree that had a PI number so they contacted the US National Arboretum and told them and offered them propagation material and herbarium specimens.

“This is the hardest thing to implement. We all want to distribute plants. We want our plants to go to Michigan and if something happens to our plant we can tell them to give it back. But it’s difficult because usually there is significant time gap between giving the plant and needing to retrieve it. And usually the person distributing the plant or receiving the plant is not the same person with the plant 10 or 20 years later. So it’s a huge challenge.”

If LG was to receive plants from another botanic garden, they would be able to keep track of them and have complete documentation of them. Whenever LG receives plants, they always refuse to make any commitment to keeping them. On the other hand, they would be willing to let the original botanic garden know if they discarded the plant. “Most institutions will refuse to commit to keeping a plant, not because they disagree with it on principle, but because they do not feel capable. They know they lose plants, people steal them, or whatever. They cannot make that promise.”

“If the plant is of significance to one institution and they give it to satellite locations, it is in their own interest to know who has what and who lost what.”

He talked about the North American China Plant Exploration Consortium. There is one coordinator and once a year he sends a list or inventory of plants to Consortium gardens to find out who has how many of which plants. Everyone updates their list.



Anisko thought that this model could be followed. Once a year they send a list to all their collaborators and ask them which plants they have. Then they would know if a cultivar is still represented at three gardens or if it has disappeared.

“You can be selective of who you give to—only those who have good records, who take good care of their trees and will cherish this tree for the next hundred years. If you give it to a local school, you know it won’t be labeled and that it will be removed with the next expansion and you will never hear about it. Who you choose to give to makes a big difference in success or failure.”

Anisko told a story about LG distributing *Caryopteris* ‘Blue Billows’ many years ago through an annual distribution list. The plant never made it into commercial trade. LG got interested in finding the plant again. LG has records of everyone who received it and wrote to them and asked if they could have cuttings. Everyone lost it except Santa Barbara Botanic Garden. And they sent it back after 30 years.

“To improve your chance of retrieving the plant you want to distribute it as widely as possible because if you lose it, someone else will lose it, too.”

Anisko did not know of Longwood ever receiving plants as a backup for another institution. He also made it clear that Longwood had never given away plants as a backup.

He wished there was a way for an institution to realize that they had something special. If LG knew they were the only institution remaining with the plant in the universe, they would save it or give it away. Most gardens do not have the time or qualified staff to do that research. “You don’t want to have common plants or those that are still in commerce. You want to focus on the plants that are on the brink of extinction.”

“Keeping duplicates on display is a very noble goal. Conservation is usually done through seed banking and tissue banking. They are not on display, but they are safe. If the

ultimate goal is to keep this germplasm from disappearing, I think that needs to be considered. If you think about why a cultivar is disappearing, it's because nobody wants to grow it. If nobody wants to grow it, how onus is it to ask an institution to take it on and keep it alive?"

LG always distributes plants with the accession number. LG does not ask for recipient institution's accession number. If LG receives a plant, then they ask for the accession number. In his experience, the LG records have been better than other institutions'. "It starts with you. You need to keep as good of records as you need because it's not really something that everybody does." LG keeps records of plants they have, but they do not keep records on plants that they give away.

They send a plant with labels, if it already has them. Plant record information can be emailed. The information comes from BG Base. Normal information can be found online through Plant Explorer.

They are willing to take lots of plants to evaluate in research, but will not take plants long term unless they fit within the mission or a design.

He thinks that in the future LG might want to give away Pierce or DuPont plants. Right now they have plants from before 1955 and do not know their history. Through his research, he is finding new relationships and connections. He may have plants that have an important history, but he does not know yet. He might have the last remaining plants with significance beyond Longwood. He would not be surprised if the original institution would not want a propagule back or someone else might want a piece because of its connections. "Sometimes it's not just the plant, but the information or story attached to the plant that makes it suddenly significant beyond just this one individual institution."

"In principle, this can only reflect positively on everyone involved."

**Laura Caddy. University of Alberta Devonian Botanic Garden.**

Laura Caddy is a Horticulturist at the University of Alberta Devonian Botanic Garden. The garden is located outside Edmonton, Alberta, Canada. The main University of Alberta campus is approximately 40 minutes away by car. The property is 190 acre, 80 are cultivated. Its mission is to provide education about the natural world and to inspire connections between plants and people.

They have several collections, including peony, lilac, alpine, rose, and primula. The focus is on plants of horticultural value that are hardy to the harsh winters of Alberta (zone 3).

There is no head curator. There are five different curators for different areas. She can only speak for her area, not everyone.

They have some rarer rose cultivars that are hardy to the prairies and some rare or heirloom plants bred by local breeders.

They do not do a lot of plant sales from their collection. Some plants are CBD protected. They try to fill requests for sharing as a way to preserve plants and back them up, but they do not have a policy within their plant collections policy. Have shared scions with Montreal Botanical Gardens, especially roses, and lilacs with Royal Botanic Gardens Ontario.

**Chris Carmichael. University of California Botanical Garden at Berkeley.**

Chris Carmichael is the Associate Director of Collections and Horticulture at the University of California Botanical Garden at Berkeley. The garden has been on the UC Berkeley campus since the late 1800s. The property is 34 acres. There are just fewer than 20,000 accessions and approximately 13,000 different kinds of plants. The main mission is to collect and display widely to support research and teaching but to do so in an

aesthetic manner that is pleasing to the public. Carmichael oversees the horticultural, curatorial, conservation and grounds operations.

We have multiples of many accessions because we try to represent the genetic diversity of plants across their range. Our garden is focused almost entirely on wild collected material. About 65% of our collection is of wild known origin and therefore we serve a particularly permanent role in research because people know they can be pretty well assured that when they come to us they will get something from the wild, the original genetic material. And we keep a database with as much information as we can obtain on the plants we have in our collection. Because of that, cultivars and horticultural varieties are of little or no interest to us.

They share cuttings or seeds with other gardens. “One of our goals is to be a repository but we freely exchange with other gardens. If they ask for it. We don’t have the time to go out and contact other people.” They have been exchanging material with the San Francisco Botanical Garden (SFBG) for several years. “And we’ve worked closely with their curator...we share material that we get from different sources and we back each other up, basically. That’s the best example of collections where we’ve lost things but we’ve recorded in our database where we’ve distributed things and we’ve been back in touch with SFBG to re-obtain a plant that has been lost here.”

SFBG has contacted him to retrieve plant material that did not survive in their garden “It’s gone in both directions. It’s a limited example and I wish there was more of this. We’ve managed to do it because we’re nearby and we have good communication. We would be happy to do it more widely but it’s sometimes hard to pull that off.” They have also shared with Quarryhill Botanical Garden and then lost the plants and had to retrieve the material.

“We all wish it would happen more. It’s just time and effort that it comes down to.”

He feels restricted by staff time and resources.

“Our policy in regards to other botanical gardens is to pretty much freely distribute if we can do that for research and display purposes. The distinction might be for commercialization of material. And we’re much more cautious about commercialization and when we have requests from commercial entities or plant breeders associated with wholesale introduction we’re much more cautious largely because of the Convention on Biodiversity. We’re very careful of distributing plants of wild origin to folks doing that sort of work. That’s not within our purview.”

When they give plants to other gardens, they give rooted plants, cuttings, and seeds.

They have been distributing plants for at least 15 years. He guessed that they might have started over 30 years ago. The database was not well maintained until about 30 years ago.

“We’re always aware that distribution could lead to a backup for us. And we do track where we distribute in our database. But again it’s sort of a core mission to preserve and share species.”

When they distribute plants, they record in their database where the material was sent. They give the garden the accession number and collection data. They do not keep track of the other garden’s information, like the accession number. They “seldom” keep track of the health of the plant or if it died. “Once it’s out of here, we don’t have the staff and time and effort to track that sort of stuff. It might be nice, but we don’t do that really. Under rare circumstances a colleague might tell us something failed and we would

always enter all that information into our notes for a given accession but that's pretty random."

He describes the program as "highly successful to the degree that we do it."

They do not require that an institution keep track of any information. They only require them to honor any CBD requirements that we are upholding. "Oftentimes we are working with curators of known institutions where we know that the data is going to be managed. If we distribute something to the Morton or the Chicago Botanic Garden, they're known institutions of good repute and that they'll be tracking the date carefully and logging in that we give them, but we don't ask them to do that."

**Dr. Patrick Griffith. Montgomery Botanical Center.**

Dr. Patrick Griffith is the Executive Director at Montgomery Botanical Center (MBC) in Coral Gables, Florida. The 120 acre property is known for its collection of rare palms and cycads. The mission of MBC is to "advance science, education, conservation, and horticultural knowledge of tropical plants, emphasizing palms and cycads, and to exemplify excellent botanical garden design." MBC undertakes plant collecting trips around the world to gather seeds from wild populations of palms and cycads.

To address the risk of loss of material, they make sure to grow large numbers of individuals of each seed accession and they give small plants to other botanical gardens.

They send to a lot of local collaborators. They have a consistent list of about four local places that they send to, that they know will take good care of the plants and keep good records. They are "happy" to send anywhere else and they have sent things elsewhere in Florida, California, and internationally.

They also distribute seeds from the wild collected plants. They distribute seeds from plants that are grown at MBC. It serves the goal to get the plants into cultivation and

to preserve the plants. The seeds go to botanical gardens, not-for-profits, and educational users. Any leftover seeds are auctioned online. A collaborator takes care of the auction. They keep part of the proceeds and MBC gets part of the proceeds. It funds the operation by paying the salary of the person who does the propagation.

There are a few incidents that Griffith can recall that distribution worked in their favor. They were able to retrieve germplasm from a Panamanian *Zamia* that they had sent seeds of to a collaborator nurseryman. It died in at MBC in a cold snap but they were able to get germplasm from the man in Hawaii. They collected palm seeds and gave some to Fairchild Tropical Botanic Garden. MBC experimented with a new method of germination and all the seeds at MBC died. Fortunately, they were able to get plants back from Fairchild. Another time, Fairchild lost all of their plants of an accession and MBC was able to give replacements.

To manage the risk of loss during hurricanes, there is “not much you can do to mitigate other than to be redundant, to grow multiple plants.” MBC has worked hard to perfect their hurricane response so that they are “very deliberate and strategic.” Assessment and recovery happens at the same time.

Even giving to a garden 2 miles down the road can be helpful. Weather can be very different within that short amount of space.

Their major collections are palms and cycads. Distribute both because “we feel like the more widely something is cultivated, the less likely it will go extinct.”

Distribution is addressed by the collections policy. Fairchild no longer has to sign an agreement because they have been working together for so long. There is a record of adjustment on both sides. “Permission to obtain plant material or photographs from MBC” is signed by person taking material. MBC uses the forms to update records. Recipient is given an invoice to use in their own records.

A lot of gardens have started using MTAs. MTA is not very well understood from a legal standpoint so we've avoided that. "Our philosophy is that we are try to follow the USDA national germplasm system's example and the way they view plants as you distribute them without restriction."

They distribute plants because they are interested in conserving plants. "The best way to keep a plant is to give it away." "That's the whole point. Plants are ingenious because they reproduce themselves. By distributing the progeny around, you make sure someone has it out there."

They have a focus on conservation and want to use their collection in any way possible to leverage conservation goals. "By maintaining plants at MBC that are extinct in the wild or critically endangered, it's a hedge against extinction."

MBC does not charge fee for plants or seeds for non-profits, educational users, or botanical gardens, unless shipping costs are very high. They once gave Naples Botanical Garden a truck full of plants. It helped Naples BG collection grow and also cleared out the MBC greenhouse space for new plants.

"For us at MBC a fee for educational, non-profits, or botanical gardens, would be going against our mission. Giving away plants is win-win for MBC anyway because it clears room in prop areas. My feeling is that in botanical gardens, a fee would be something that it would take people a long time to warm up to."

"Once it leaves MBC, it is no longer ours... To me, everyone is just too busy. Just give them a plant. But I think, I'm too busy to check up on anything outside the fence here. I'm going to trust them. If we need anything later, we'll just have to ask."

"I enthusiastically think our program is successful. I think it's working great. I think exchanging plants is the way to go for so many different reasons, but primarily it keeps the plants safe."



The most important part of a program is “exchanging without restriction or preconception and trusting the other side of the exchange to do a good job. The last thing I want to do is give a plant to another institution with a lot of conditions or restrictions.”

He would like to improve their program by increasing communication with people they give plants to, but he is not sure how to do that. He would like to set aside time to catch up and find out how the plants are doing that they have given away. There is a difference between reporting back and a conversation. Asking a colleague to report back would make him feel “uncomfortable.” He does not want to make someone feel like he is second guessing their skills.

The minimum information needed for MBC’s records is the taxa, accession number, where it went, and what date. “We can go from there. We can only trust that they have similar enough record keeping so they would be able to find it.”

“Sharing plants is the way to go because you never know what is going to happen. There could be any kind of thing that you’re not planning for or that you are planning for, that can take one of your prized plants away. And if you’re Mr. Scrooge and didn’t share it with anybody, now nobody has it.”

#### **Dr. Michael Gross. Sister Mary Grace Burns Arboretum.**

Dr. Michael Gross is the Director of the Sister Mary Grace Burns Arboretum. The Arboretum is located at Georgian Court University in Lakewood, New Jersey. The property is the historic estate of George Jay Gould and includes four historic gardens. It is now owned by the Sisters of Mercy. The arboretum was established in 1989 and is integrated with the campus. Most of the gardens are built around conifers or statuary and sculptures and do not include big display beds. Gross cares for the arboretum as well as teaching and fulfilling administrative duties.

The arboretum has no paid staff. Gross cares for the arboretum as a hobby and keeps track of the plants in a database because he enjoys it. They have grounds staff that mows the grass, but they aren't "into" the arboretum. If he were to leave, "probably things would fall apart."

The historic azaleas and rhododendrons are not in the database because their stories are not known. There are no records from earlier periods when trees and shrubs were planted. He is trying to keep basically the same vegetation today as when it was created.

He would be interested in receiving plants if they fit within the mission or design.

They would pay for plants "if they were things they really wanted." He would pay for a plant that fit into a specific collection or from the Gould period and might be particularly interesting.

There are plants that they have lost that they would like to replace. They lost plants in Hurricane Sandy. They didn't know what they were to the cultivar level and "now they're gone."

He would be able to keep track of plants in database, location and health. He would be able to report back. He is using an Excel spreadsheet. It has a columns for condition, when it was acquired, where it came from, special notes, location based on longitude/longitude coordinates, nativity, accession number, scientific name.

He would be willing to return a piece to the original institution if the original plant died.

To make an exchange win-win, for the arboretum, the plants would have to help build a current collection or fit the time period of historic estate. He would like plants that build on the historic collections. Native vegetation is also part of the mission. Most

important is that it fits within the mission. He needs plant material that does not need a lot of care and would do well in the environment he has (New Jersey Pinelands).

Whether or not he need anything “depends on the scale.” It depends because of staff time and space. “If I could take as many or as few things as you needed, then I would say that I don’t need any resources. I would only take things that I thought I could manage with what I have now. It would be a small incremental thing that I would fold into what I normally do. If I was planning to add to the holly collection, rather than go out and buy something, there would be this holly from somebody else that they wanted some place to take that plant. That would be fine because that would take care of my goal for the year anyway.”

If he wasn’t familiar with the plant, he would want someone to give him instructions. He does not think he needs training, but would be open to instructions or advice.

#### **Robert Mottern. Sarah P. Duke Gardens.**

Robert Mottern is the Director of Horticulture at Sarah P. Duke Gardens. Duke Gardens is owned and operated by Duke University and located on the university campus in Durham, North Carolina. The property is 55 acres. It is “dedicated to learning, inspiration and enjoyment through excellence in horticulture.”

They recently revised the plant collections policy. Risk management was discussed about but not developed. They talked about what they would do if they lose a collection in case of disaster. It is still under the development phase. For their native plant garden, they do have some idea of where they could find replacements, but they do not have an actual plan or procedures if something should happen.

They do plant sales. They are propagating from some of their core collections and sell them in the plant sales. It is purely retail and not meant as a way to distribute their collections. They do not keep track of where things go. They do have a policy for general plant distribution, how they do it and who they would distribute to.

He did not know if they had ever shared plants with other gardens. Nothing has been recorded. They do not distribute from the trillium and *Asarum* collections because they are too delicate. If they were to give away plants, it would probably be from the daylilies. They would go for things that are easy to divide or propagate.

They might not charge a fee for plants if “If we were doing it to spread our collection and it to help another garden, so there are benefits on both sides.” It would depend on costs involved.

He would like to see garden plant lists or records available for viewing on a website so that gardens can see what each other have.

They only recently have a fulltime plant recorder. All records are now up to date. They are currently mapping gardens and all plant material. He would like to have an online search tool.

To make a program successful, he feels they would need better propagation facilities. “There’s more to it than that, but that’s where we’d start. The plants that are rarer are the plants that are harder to propagate.”

He would want someone to report back on an annual basis.

“Most gardens are willing to share with another garden if they request, but it’s not formal. We’re all trying to promote horticulture as much as possible. Most gardens have plant sharing policies, but it’s not necessarily for safekeeping their own.”

“It [losing a collection] doesn’t happen on a frequent enough basis to where people are overly concerned about it. It’s a smart thing to do [duplicate collections], but

the odds of losing our entire native azalea collection are extremely remote, so I guess it's by a per garden basis. If we were at risk of hurricane or flood, then it would be different. I tend to think of natural disaster, but it could be poor policy from someone higher up that could do damage to a garden as well."

**Mark Richardson. Garden in the Woods.**

Mark Richardson is Director of Horticulture at Garden in the Woods. The garden is owned and operated by the New England Wild Flower Society (NEWFS). It is located in Framingham, Massachusetts, and is approximately 45 acres. The focus of the garden for the past five years has been New England native plants. They are slowly removing the plants that do not fit within the mission.

If they have rare plants, they are truly rare, endangered, threatened, plant species. They are ecologically rare as opposed to horticulturally rare. When they collect from the wild, it is only seeds so that they live a healthy, viable population of the plant. They are practicing ex-situ conservation. Seeds are in seed bank and/or growing in the garden. Their mission is to be able to restore wild populations with seeds collected from that specific location. They do not see the garden as a good origin to reestablish wild populations.

They do not have a formal program to give plants/seeds to other gardens, but they have done it in the past and would do it again. They have never required paperwork to be signed.

They sometimes receive plants from other institutions. The original institution accession information is kept in the BG Base plant records.

They have given plants as seeds, cuttings, bare root, and also potted plants. When just sharing plants, they do not charge. They sell a lot of plants through retail and through

their native plant nursery. They would not charge another botanic garden if sharing plants.

They have not had to retrieve material from other botanic gardens or organizations that he knows of.

He would be happy to give plants to another garden. He sees plant distribution as “like an insurance policy.” He would want some type of reporting system, so that he knows that the plants are healthy. If he gave away a choice specimen to three gardens and one died, he would want to know that so that he could find another garden to grow the plant. He would want an annual or every 2-3 year report to know that his plants are still there and happy and healthy. He wants to know that they are keeping track of the provenance of the plants, his accession numbers, so that 15-20 years down the road they can be identified by that number. They need to keep accurate records of which of NEWFS plants are there.

He would choose gardens wisely that he was confident they would know how to care for the plant. He would be interested in knowing when and where they were going to plant it. “I would not call into question another garden’s ability to care for a plant that I gave them. I would screen them before giving them plants. I would know their reputation and their strengths and weaknesses as far as caring for collections. I wouldn’t want to be involved in planting unless they were trying to build PR around the program and get staff involved from the two organizations.”

“I would like someone to pitch a fully executable program to me that I can just buy into with all the pitfalls worked out. A streamlined process to getting involved with it and it’s simple.”

He would want to have the material going to a place that has a fulltime plant records person or curator.

They have all the resources for keeping track of the plant material, but he thinks the other organization having a curator or plant records person there is important. He might not want to participate as a recipient because he might not have the right staff to track the received plants.

He thinks that shipping could be funded by someone, like APGA, or the gardens participating should understand all the costs involved and who pays for what.

**Marita Tewes-Tyrolt. The University of Utah Red Butte Garden.**

Marita Tewes-Tyrolt is Horticulture Director at the University of Utah Red Butte Garden. The garden is located in Salt Lake City, Utah. The property is 100 acres including display and natural gardens, walking paths and natural areas. It tests, displays, and interprets regional horticulture for the intermountain west. Its mission is “to cultivate the human connection with the beauty of living landscapes.” Tewes-Tyrolt has been at Red Butte for 19 years.

They do not have a program in place where they “expect to get anything back.” They have a number of hybrid oaks and offer them for distribution, but it is more of an Index Seminum approach. They also gave cuttings and plants to New Orleans Botanical Garden after Hurricane Katrina. They gave some cuttings of hybrid oaks to a place overseas (Holland?) about 15 years ago.

They do not regularly exchange plants with other gardens. They have exchanged seeds. They put a list of plants on BGCI’s website and have gotten requests from that. They have received plants from other botanical gardens that they could not find in the trade. The goal was to expand their collections.

They do not have a disaster plan in place. What they have thus far is focused on personnel safety. The most likely disaster in their area is fire or earthquake causing a dam

to break. They do not expect ‘catastrophic damage’ from the dam, so they are not planning for it.

They have a collections policy and a draft of a collections management plan. It does address distribution. They will give cuttings if requested. There is no charge for cuttings. They mainly give to homeowners.

They have a few rare plants in their conservation department. They have a seed bank in a freezer.

The only time they charged a fee in the past was for postage for acorns. If it was less than \$20, they probably wouldn’t charge. It would depend on the type of the collections and how rare they are and how easily replaceable they are. It depends on per garden, per collection, per item.

She can’t say if they have plants that are not available in the nursery trade. They do consider their hybrid oaks irreplaceable. Historic records of the oaks were not good. It is hard to confirm the identity of the older trees. They have talked about doing more propagation and trying to grow some from cuttings so that they can replace them if needed. They have given some oaks to UCDavis. They do not have records of what they gave.

They are building a new garden where they will have a *Penstemon* collection. They do not plan to distribute because it will all be wild origin and they can still go out in the wild and collect replacements.

They now have a plant recorder. They have a custom database, but are switching over to a new database in the future.

She does not think that a plant exchange would necessarily work for the plants they have. The rare plants they have are endemic to a certain type of soil and those plants



will not be successful if sent somewhere without the right soil. It would be a case by case basis.

She would probably want a partner garden to report back on a yearly basis.

## **Appendix G**

### **INTERVIEW QUESTIONS FOR NON-PROFITS AND CULTURAL INSTITUTIONS**

The purpose of this project is to write a policy so that it may be used by botanical gardens and arboreta that possess herbaceous perennial collections in order to distribute plant material to other sites and successfully retrieve the same material if the original collection is destroyed.

These interview questions seek to understand what museums, historic sites, and other non-profit organizations need from botanical gardens or arboreta in order to successfully participate in a plant distribution program. It seeks to understand if cultural institutions have participated in plant distribution program in the past or otherwise worked collaboratively with public horticulture institutions, if they have written policies, and how those policies can be improved upon in order to create a successful original plant material distribution program/policy.

Participants may answer as few or as many questions as they wish. The interviews will be audio recorded unless the participant requests no recording. All audio recordings will be destroyed at the end of this project (projected date July 2014). Participant full names will be associated with the interview unless the participant requests that their name be removed.

There should be no risks associated with this interview. The benefit of the interview is the inclusion of the participant's ideas and opinions in the creation of original plant material distribution program/policy.

Do you wish to participate in this interview?

Please check: Yes \_\_\_ No\_\_\_

Do you wish your name to be associated with your interview?

Please check: Yes \_\_\_ No\_\_\_

I understand that this interview will be recorded. All recordings will be destroyed at the completion of this project.

Please check: Yes \_\_\_ No\_\_\_

I do not want my interview to be recorded.

Please check: Yes \_\_\_ No\_\_\_

Are you over the age of 18?

Please check: Yes \_\_\_ No\_\_\_

Questions:

1. Please give your full name.
2. Please give the name of your institution.
3. Please describe your institution and its mission.
4. Do you loan items from your collection or receive items from other institutions?
5. Do you have a written loan policy for your institution?
  - a. May I have a copy of your policy/program protocol?
6. Do you have a garden or green space at your institution?
7. Do you have a professional horticulturist on staff?

8. Does receiving plants fit within your mission?
9. Do you have historic/heirloom/heritage plants?
  - a. Have you ever given plants to another institution (such as a botanical garden or a museum)? Was there a written or verbal agreement between the institutions as to the care and maintenance of the plants?
10. Have you received plants from a botanical garden or arboretum in the past?
  - a. If yes, what is the name of the botanical garden or arboretum?
  - b. Did you pay for the plants?
  - c. Was there a written or verbal agreement between the institutions as to the care and maintenance of the plants?
  - d. What parts of the program do you think could use improvement?
  - e. Have you improved/changed your program in the past to make it more successful?
11. Would you like to work with a botanical garden or arboretum in the future?
12. Do you think that you could keep track of plants (if given the database to do so)?
  - a. Would you be willing to report back on the health of the plants, perhaps every 2-5 years? Why/why not?
  - b. What is the maximum amount of information that you could record?
  - c. Do you have paid staff that would track plants?
13. Would you be willing to pay a fee for plants? Why/why not?
14. How do you think a fee would affect the program?
15. Would you be willing to return plants or a piece of them to the original garden if the original plant was damaged/destroyed? Why/why not?
16. What do you think it would take to make a plant distribution program win-win for your institution?

17. What parts of a loan or exchange program do you think are most important?
18. What do you need to ensure the success of the program?
19. Have you heard of other distribution programs that I should look into?

## **Appendix H**

### **SUMMARIES OF INTERVIEWS WITH NON-PROFITS AND CULTURAL INSTITUTIONS**

#### **Eric Becker. Drayton Hall.**

Eric Becker is Manager of Landscapes, Horticulture, and Modern Facilities Drayton Hall. Drayton Hall is a historic house and landscape located outside Charleston, South Carolina. Drayton Hall is owned and operated by the National Trust for Historic Preservation. The mission of Drayton Hall and the National Trust is to “is to preserve and interpret Drayton Hall and its environs in order to educate the public and inspire people to embrace historic preservation.” The landscape has not been restored to a certain time period. It is preserved as it was when the National Trust took ownership.

The house loans furniture and architectural fragments. It has written loan agreements for each one. They have an agreement with Colonial Williamsburg to loan objects to CW and CW keeps them for 5 years and conservation of them. It’s a case by case basis. They have not received items on loan that he knows of.

They have a tree inventory that needs to be updated. Need an update on software. He would like to use GPS for the landscape. Shrubs are on landscape master plan. They have a landscape master plan for the 15 acres around the house. Plants are not accessioned or in a database.

They do not have volunteers. There are two landscape crew members that are part time. They are not formally trained horticulturists.

They would be interested in receiving plants if they are able to build a new museum building. They would like an interpretive garden that includes plants that are

listed in archival material 1790s-1820s. They would only accept plants associated with historical documents and research. They want to show the connections of the Draytons with early botanists in America.

There are some historic plants on the property. Azaleas that are cultivars. Paw Paw trees brought by André Michaux. He would be interested in sharing azaleas not just as a backup but just because people might like them.

Keeping track of plants would be contingent on a database and labeling. He said how much he records “Depends on the amount of plants, effectiveness of the software and staff available on site.” He might be open to training on the best way to keep track of plants, like what software to use.

They could afford a fee or at least the shipping costs. The goal is to keep it as low cost or free.

He would you be willing to return plants or a piece to the original garden if the original plant was damaged, “but with the provision that there is a process and indemnification for unsuccessful survival of plants.”

“If something dies, is there a penalty? Things will happen to plants. What are the reasonable expectations?”

To make an exchange program win-win, “everything would have to be tailored specifically to the institution.” Expectations need to be clear. He would want to know what data is needed and reciprocity costs. “How do I, with my resources here, take care of them?”

He would like to see a searchable database of plants that are available. “If there were certain plants that we wanted, how would we find out about it? We need some way to look through a database or solicit plants that institutions are willing to give. The more

data available...that would be great. We spend a lot of time looking at historic dates of introduction or when they were available.”

**Stephen Bohlin. The Andrew Low House.**

Stephen Bohlin is the Director of The Andrew Low House, located in Savannah, Georgia. It was constructed in 1848. It is owned and operated by the National Society of Colonial Dames of America in the State of Georgia. The mission of the house is both historic preservation and education.

They loan items from the house to other sites for temporary and permanent exhibits. They prefer not to receive loans. They have a complete loan and collections policy.

The garden plan in the front of the house is original. The bed shapes have not been changed in over 160 years, but the plants within the beds have changed. Some of the plants are original, but he can't say how many or which ones. Recently, they have lost some plants from cold. There are some plants in the garden that he thinks are older or antique.

Lots of damage was done to garden five years ago when major work was done on the house. They had to do major work to rehabilitate the garden. They hired Robert and Co. to make a site and garden plan. They have been following that plan since 2009. They try to find old plants when they need to replace. “It’s very hard to find the old species. Sometimes people look at us like we’ve totally lost our minds.”

They do not have a horticulturist on staff. They have a Garden Chairman that changes every few years. They have a contracted gardener who has his own company and takes care of other downtown gardens. There is another person who will help with major garden projects/work days.



In the past, they have received plants from the City of Savanna, from horticulture enthusiasts in town. They have not worked with a botanical garden or arboretum.

He thinks the Dames would be interested in working with a botanical garden or arboretum. He knows they would like a camellia named for Julia Low to be propagated so that they could acquire more plants. There's another Colonial Dames camellia in Columbus, GA, that they would like cuttings done from and brought to the back courtyard.

They would be able to keep track of plants received. They are currently working on labeling all plants in the garden. The garden already has regular care. They would be able to report back if the plant died or thrived. They would be willing to return cuttings from plants. There are active gardeners on the board. They would understand the importance of doing that.

They would be willing to pay a fee for plants. "We certainly paid plenty for plants in the past. I'm certain the Dames, if they deemed it was something that they really wanted for the garden, I'm sure they would be willing to pay for it."

To make a program win-win for the Andrew Low House, he would like "A good index of plants that were available. Both the botanical names and common names and historic names. Some kind of date of when it came to the country, was developed or introduced. A database on a website that people would know to go. It would need to be a major website that people would logically know to go to and not buried in the Longwood website or the Southern Garden History Society."

He would be willing to enter into an agreement so long as they were willing to work with the Dames. "We have good relationships with local museums. We are used to collaborating."

To ensure success of the program, he would need to know when to plant the plant, if the plant is suitable for the zone, and recommended care.

The price of the plants might hinder the organization's participation. His budget lumps maintenance and new plants together, and maintenance comes first. A lot would depend on cost. Getting the plants shipped and in good condition would be something that would concern us.

He thinks period gardens are important to historic houses, but they struggle to educate the public about the gardens, to identify and label all the plants. By the time the label is made for the Spanish squill, it has gone dormant. Many antique species are not as disease resistant. Period [varieties] might not be as attractive as one of the hybrids. Period roses "might not give you enough bloom to show off...People want wonderment." Interpreting older plants for visitors helps them understand why they look homely or not as nice as modern cultivars and they end up liking them. He wants the garden plants to be historically accurate, but struggles to find those plants.

#### **Lois Cole. Historic Deepwood Estate.**

Lois Cole is the former Executive Director of Historic Deepwood Estate. Historic Deepwood is a Queen Anne house with four acres of Victorian era gardens and nature trails located in Salem, Oregon. It is a unique situation because it is maintained by four different organizations working together. The City of Salem owns the property. The Friends of Historic Deepwood manages the house. The City maintains the grounds with the Lord and Schryver Conservancy and the Deepwood Gardeners. Cole could not speak on behalf of the other organizations.

The City buys the flowers that they and other non-profits use. It struggles to keep even that in the budget. The City makes the decisions on the grounds. There is a buildings

and landscapes committee where all the organizations meet up and discuss issues in the gardens; it is chaired by Historic Deepwood's Executive Director.

She thinks that the City and Lord & Schryver Conservancy both have professional horticulturists on staff.

Receiving plants would fit within the mission. Which plants they accept would depend on keeping within the design policies. The plants do not have to be from a certain time period; it's more about design.

She does not think that they have worked with a botanic garden or arboretum in the past.

She thinks that any or all of the partnering organizations that take care of the grounds would be interested in plants. She does not know who would keep track of plants—probably each would keep track of its own depending on where it is located in the garden.

She's not sure what would be needed to make an exchange successful. She cannot speak for the other organizations.

#### **Doug Conley. Edsel and Eleanor Ford House.**

Doug Conley is the Director of Landscapes at the Edsel and Eleanor Ford House. The Ford House is located outside Detroit, Michigan. It is a National Historic Landmark because of the intact Jens Jensen landscape that surrounds the historic house. The house is curated and treated as a house museum.

The landscape collection is not curated. They are starting to record the tree canopy. They use Excel or Access for keeping track of plants.

There are gardeners on staff, but only one has an academic horticulture background. A few are master gardeners.

Receiving plants might fit within mission or the interpreted time period. They would be very interested in receiving a Jens Jensen legacy plant.

To receive plants they would need training. They could report back to original institution. Reports should be annual or semi-annual. At least report on if a plant is alive or dead. He could also do an assessment of state—thriving, it's okay, it's dead. A one page cover sheet with a few details would not be too cumbersome if it was semiannual reporting. A 5 year time window is too great with how transient employees are today. You might lose connection.

Conley does not have volunteer base that he would trust. He would give the reporting job to the arborist.

He would be able to pay for the plants. He would want costs included as part of the negotiation; he would want to know up front. How much he would pay depends on who benefits from the plants. He would not want to pay if he was just receiving roses, but if they fit the time period it would be acceptable. He would like to restore the rose garden with Jens Jensen's chosen roses.

He would be willing to return a piece of a plant if the original was destroyed.

To make an exchange win-win for the Ford House, there needs to be clear communication between both sides of goals and expectations. The plants would have to fit the historic mission or design intent of the property.

For that first year, he they might need extra visits or training. There should be front end commitment that the plant establishes. The first year both organizations should communicate well to make sure the plant is delivered and planted correctly. He is thinking about trees especially because of their particular planting depth.

**Susan Damon. The Fells Historic Estate and Gardens.**

Susan Damon is the Nursery Manager at The Fells Historic Estate and Gardens. The Fells is located in Newbury, New Hampshire. The property is nearly 1,000 acres. It is the former lakeside home of writer and diplomat John M. Hay. It is a preservation project of the Garden Conservancy. The mission focuses on the natural setting, gardens, and the history of the former owner of the property.

Damon thinks the organization would be interested in participating in some type of exchange or preservation program. "We want to preserve our situation, too, in the sense of being part of the horticultural world. Because we have a historic garden and a historic house, we're trying to promote visitation and membership as well."

They have tried to maintain what was growing in the past and keep within the style. The biggest draw is the rock garden. There is historic documentation of the gardens.

Damon manages the plant nursery. It is 25 years old and 80x100.. She is growing plants that have come out of the landscape that were overgrown and will later go back into the landscape or she is growing them just to keep it going. They will sometimes buy in things or receive donations without plans of where they go. Those plants are stored in nursery. Sometimes they are used to supply the plant sale.

They have "real estate" for more gardening. They have two people and interns that care for the garden. The new manager is a landscape architect. They are trying to figure out what plants they have. The old records from family were not detailed or complete.

Gardens are in the "feel of the time" but Hay family planted annuals that are too expensive for The Fells organization to continue using. They have a photographic history of the property. But they have decided to not keep them exactly and they are trying to

appeal to the public. There is a growing interest in native plants from both the board and visitors.

To her knowledge, they have not received or given plants away. Receiving plants could fit within their mission. She sees it as a promotion of horticulture and a promotion of community between organizations with similar missions.

The Fells cannot take something that needs babying. There are only people to tend the garden nine months of the year. There is no greenhouse. Garden staff is two full time people and one half-time. The rest are seasonal. The Fells cannot throw whole department into the effort.

She thinks they could track plants, especially if they could pick the quantity. They could set up database. Interns would help in the summer; recording could be a piece of their responsibilities.

They could report back of health. They would map the plants or mark them in the landscape. They would be willing to return piece of the plant if not too complicated.

Probably could pay for plants or shipping. Within reason.

To make an exchange win-win for The Fells, there would need to be a public relations or awareness piece. "To be a player in the horticultural world. We're always looking for more members and for more people to come."

The most important part of the exchange would be "being part of the community of plant preservationists. The exchange would promote our commitment to that. It would be a public relations piece. It might get us more on the map of people who are interested in the preservation of gardens."

To ensure success, The Fells "needs as dedicated group within the organization to take this on even as personnel changes, so it won't be forgotten if staff left or volunteers

left. It would be a more established procedure and offering for us. Maybe we can make it an intern project or duty.”

### **Tyler Diehl. Ladew Topiary Gardens.**

Tyler Diehl is Head of Horticulture at Ladew Topiary Gardens, located in Monkton, Maryland. The property is 250 acres in total with 22 acres of gardens. The mission is to “maintain and promote the gardens, house and facilities in keeping with the creative spirit of Harvey S. Ladew for the public benefit and for educational, scientific and cultural pursuits.” The house and gardens are listed on the National Register of Historic Places.

Diehl is a horticulturist. There are four full time gardeners and one part-time gardener. They have volunteers.

In the house, they are still accessioning items and creating a database. The garden had no records except for old board meeting minutes, which were not specific. He has kept records since he arrived in 2003 in an Excel database. They are now going to Iris BG. In five years, he plans to have 90% of the gardens in Iris BG.

They deaccession plants that are removed. He notes the cause of death. Generally, it is him that does plant accessioning.

They do not have a written loan policy. They might give someone an “in kind slip” for donating a plant. In his database, would note where it came from and when.

Receiving plants could fit within the mission, if it is unusual or rare. They would be open to working with an arboretum or botanic garden in the future. They could keep track of the plants in the database. He is reluctant to commit to reporting back because of staff time.

They are actively researching iris that Mr. Ladew had and acquiring those varieties for the garden. They can't find many of the varieties because they aren't commercially grown any more. "If another garden had them, that would be great." They are also interested in lilacs.

They would be willing to return parts of the plant to the original institution.

To make a plant exchange win-win for Ladew, it would have to be easy. They are short staffed. There would have to be ease of access to information on plants so that Ladew staff can easily find what they are looking for. They need access to a database of plant cultivars available.

Diehl does not need anything to be part of an exchange, as long as it is for something like irises. He has enough staff and he has the database.

He plans on making his Iris BG available online in the next few years. So anyone can see what Ladew has.

He thinks that if APGA had links to other gardens' databases it would be helpful and make it "quick and easy."

### **Chuck Gleaves. Kingwood Center.**

Chuck Gleaves is Director of Kingwood Center, located in Mansfield, Ohio. It was founded 1953. It is 46 acres. It is primarily a display garden for "the pleasure and education of its constituents." Kingwood makes a point of using unusual plants to inspire homeowners. It tries to make unusual plants accessible and put them in an aesthetic context. There are eight horticulturists on staff as well as volunteers.

"We would like to keep detailed records, but it isn't a priority as a display garden." Records are useful, but limited resources do not make them a high priority. "We don't have tight records. Some of the distributors of these plants would probably be



frustrated, but yet we can't be expected to do the kind of record keeping they do. There's got to be some type of middle ground. We have to be held responsible for keeping track of the plant, but not quite to the same standards of the donor organization."

Kingwood would need to add a type of program so that someone would have the responsibility to keep track of the plants rather than "throw them into the mix as anonymous donations. And then a few years later not really remember where they came from or where they are in the garden." In the past, Kingwood received peonies from breeder Kekler, but the labels were mixed over time and are not associated with the correct plants.

Has accepted plants from an arboretum, but it was informal, a gift. There was no agreement, no paperwork.

If the plants fit a need, they can and will take care of them. They are limited by the composition of the garden and a plant has to fit into that composition. They will take plants as long as they enhance the aesthetic composition and educational efforts to "increase the appreciation of horticulture by expanding the pallet of gardeners."

Plants from Mr. King's time period have no more appeal. In the future, if they try to restore a garden, they might want historic plants, but not right now.

They could keep track of 1-5 plants if they are important enough to Kingwood. It has to be a mutual agreement.

Gleaves thought that a fee for plants or shipping might help determine how important a plant is to an organization. He would be able to make a nominal contribution for the plant to offset costs. "The more we spend, the less we would feel obligated to the giving institutions."

Would be willing to return divisions or cuttings to original organization but doesn't want to be held "liable" for them.

To make it win-win for Kingwood, Gleaves wants plants that “cannot be obtained in the open market, were of use to us, and were of nominal cost.”

In order to ensure success of an exchange, “the fewest obligations the better for us. There should be obligations, but the easiest is no obligations. If the plants were valuable enough, we could make them a priority and assign them to somebody.”

He likes the idea of APGA coordinating a program like this.

### **Amy Graham. Longue Vue House and Gardens.**

Amy Graham is Head Gardener at Longue Vue House and Gardens, located in New Orleans, LA. Longue Vue’s mission is to “preserve and use the historical and artistic legacy of Longue Vue and its creators to educate and inspire people to pursue beauty and civic responsibility in their lives.” The landscape was devastated by Hurricane Katrina in 2005.

Longue Vue loans items from its collections and received items from others. They have a written loan policy and a strategic plan.

There is a professional horticulturist on staff. Receiving and sharing plants fits within the mission. There are historic plants on the property, mainly Louisiana iris.

They have given plants to other institutions. There was a verbal agreement. The plants, Louisiana iris, died because they were requested and planted at the wrong time of year. The donation and time of delivery was determined by a non-horticulturist administrator.

They have you received plants from a botanical garden or arboretum in the past. They received *Colocasia* from Atlanta Botanic Garden when they were going to discard them. They did not pay for the plants and there was no agreement between the organizations.

She would you like to work with a botanical garden or arboretum in the future.

She would be able to keep track of plants if given the database to do so, but “with difficulty (labor time)”. She would be willing to report back on the health of the plants, every 2-5 years. LV does not have paid staff at this time that would track the plants.

She would be willing to pay a fee for plants, but a fee would affect the program and “would reduce sharing.”

She would be willing to return plants or a piece of them to the original garden if the original plant was destroyed.

To make a plant distribution program win-win for LV, she would like to have the connections/partnerships advertised.

The most important parts of a loan or exchange program would be the “use of plants instead of throwing them in the dumpster. Our LA iris culls are so plentiful that we cannot give them away—we have saturated the market locally.”

To ensure the success of the program, she would like “a website or link with plants available to accept or trade.” With a FedEx number to charge shipping to, LV would give away Louisiana iris and other native plants that are plentiful in the garden.

### **Krystyn Hastings-Silver. Lyndhurst.**

Krystyn Hastings-Silver is the Preservation Manager at Lyndhurst, a historic house and landscape located in Tarrytown, New York. It is owned and operated by the National Trust for Historic Preservation. Hastings-Silver is responsible for the preservation and conservation of 67 acres with 15 buildings that were built between 1838 and 1911.

A list was made in the 1990s of all the trees and shrubs. They have enough space for more plants. Lyndhurst has not received plants from a botanic garden in the past 8

years, but might have before she arrived. She would only want to accept plants that complimented or were in keeping with the historic plantings. She would be willing to receive plants that fit within the mission or time period (1842-1961).

She would probably need software. She does not have a horticulture background, but if she had software or resources to guide her, it could be done. She could reach out to nearby horticulture programs for interns so that they could get hands-on experience. There is not a professional horticulturist on staff. They have 3-4 people caring for the 67 acre site.

She might want to create a special place for plants—which they can do within their acreage—so that it was a learning garden. It would have to be clear that it is a new garden and follow Secretary of Interior's Standards. They cannot fool the public into thinking that it is a historic garden. It would be set it aside and signage would tell the story.

Would be interested in receiving plants that were lost in the past, but it depends on why they were lost, like attrition. They have a deer problem and a blight attacking some trees. What they could accept would be a case by case basis.

Lyndhurst does not have a plant database. It is trying to get arboretum status, but they do not have a database. She wants to implement the accession plan created in the 1990s with trees present and lost and digitize it so that they can update it on an annual basis. She thinks it would be a valuable tool.

They have “vegetative accession plan.” It was done as art of a cultural landscape report which documented the property from inception to present. The plan categorizes and notes all the trees and says which period of significance they belong to. She only has a hard copy. If they had a digital copy, in the off season, they could go through and update conditions and removals. Right now, they're just marking on a paper map.

The European Copper Beeches are in decline. They have arborists come in and care for them, giving them deep root injections, etc. They are planning to replant, but are using a different cultivar. They are making it a learning experience for visitors about what is stewardship. Lyndhust hosts Arbor Day festivities and other programs to educate public about why and what it is doing with the trees.

Have many trees that are from the period of significance. There are Linden trees from 1840s-1850s and they also have shrubs, including lilacs, and a rose garden from 1911. There are a few heirloom plants left. In the 1960s, a garden club redid the garden as a learning garden, so there are modern cultivars mixed in. The planting plan is original, but not the plant material.

She would love to have the weeping beeches, copper beeches, linden trees, and some of the roses propagated. There used to be a nursery on site, but they lack the skill to operate it. If someone wanted to take over the garden space and operate it, they might be open to it.

She would like to work with a botanic garden in the future. She currently consults with staff at NYBG when she needs advice on protecting trees during site work or has questions on trees or plantings.

She would be able to keep track of plants if given a methodology. Paid staff might be able to track the plants, but it depends on commitment. It would probably be her. Maybe she could find volunteers, but right now there is not a strong volunteers base.

Could pay for plans or shipping, under \$100. Or she would be willing to drive to meet the colleagues if they were nearby.

It would be helpful to have staff from original institution help plant or do training. A key component is teaching her staff how to handle the plants. Then they could do it

from there. Once they know the task list, they will know how to maintain them.

Training/teaching would be “hugely beneficial.”

She likes the idea of cross promotion in digital media. They already do it with other programs. She could even build a talk around it or a landscape tour. She could make simple signage referring people to a website.

The challenge is the staffing capacity and financial ability. “It’s finding a way to make that work within the structure. These are the meaty things that we as institutions want to do, more than the maintenance and stewardship, it’s the cultivation. We need to find a solution that is not onerous to the donor and not onerous to the receiver.”

To ensure success, she wants a Standard Operating Procedure. “If you take possession of this plant, you have a clear outline and expectation so that the recipient would know at the outset and wouldn’t disappoint the giver. The responsibilities are and what they hope to get from it. A two year commitment, a five year commitment, a 10 year commitment. The reality of it, what the expectations are. How much time they need to spend a week monitoring and what database information they need. The more electronic and expeditious it could be. A proposal so that when institutions are coming together and going forward, so that institutions with more staff can do something more elaborate and smaller institutions can’t do as much. A protocol is key for success. So people can commit or not commit based on what they understand the net outcome should be. Sometimes we say “yes” and then we can’t follow through and that would disappoint everyone.

### **Tom Johnson. Magnolia Plantation and Gardens.**

Tom Johnson is Director of Gardens at Magnolia Plantations and Gardens (Magnolia), located outside Charleston, South Carolina. Magnolia was founded in 1676

by the Drayton family. Although gardens were created in 1676, most of the gardens date back to the 1830s. Magnolia is 128 acres and well known for its historic camellia and azalea collection. Johnson was one of the founding members of the Great Gardens of America Preservation Alliance (GGAPA) which seeks to preserve historic varieties of camellias and azaleas in the United State.

Magnolia aims to restore its gardens to how they looked in the 1830s. They need to use the same cultivars that were present at that time. “You can’t restore a garden back to 1830 and plant a 1970s variety of azalea or camellia... Then we discovered that they had been lost in this country.” They accession all their camellias and azaleas.

They started travelling to Europe and collecting the pre-1900 varieties of azaleas and camellias. They took cuttings off of them, imported them, and grew them at Magnolia for the restoration of the gardens. Now, when they import cuttings, they will often give cuttings to a commercial grower, he grows them, and then sells them back to Magnolia when they need replacement shrubs.

The project is not necessarily supported by the mission, “it’s a necessity.”

“Then we got worried if Magnolia Plantation has the last one of these rare camellias and a tree falls on it during a hurricane and it’s lost forever. So we joined with 30 other gardens, colleges and institutions, and formed what we call the Great Gardens of America Preservation Alliance. Alliance gardens work together to import these older varieties of azaleas and camellias. Each garden has set aside land to plant them on and we developed a database so that if we lose a camellia, we have a list of every garden in the country this one is plant and go and reharvest cuttings and start over.”

“Out of 86 Belgian-India azaleas imported into America, there are only 12 left today. The rest have been lost.”

“You can get your focus too broad. There are so many plants. We wanted to focus on what we need for the restoration of the gardens here.”

No paperwork is signed when someone joins Alliance. It's a gentlemen's agreement. To join, they send in a request. The members vote on it. They do not have a written plan or policy. They did not want to make a program and structure that would exclude smaller gardens. “The idea is that anyone who wants to join can because we want to get a lot of these varieties...the idea the more gardens that plant them, the more chance the variety has to survive. We have public gardens and universities and individuals who want to plant them in their back yards.”

Every so often, they hold a plant exchange and give away extra plants that Alliance member gardens do not need. They do not charge anything. Only Alliance members attend. “We let them come pass out plants to preserve them.”

“The whole thing started because we ran into so much trouble trying to find the varieties that we needed. They're just gone.”

On a request basis, Magnolia gives plants to other people. They gave cuttings to Camellia Forest Nursery and they have started selling them. “Which is what we wanted. The more we get it into the trade, the better off we are, the more they're preserved.”

They keep a database. The website used to have lists of what each garden had, azaleas and camellias, so that the general public could cross reference. The idea was that Alliance gardens kept lists of what was available and then a garden interested in one of those varieties could contact the garden directly.

One part of the Alliance that could be improved upon is the how they “follow up” on plants that were shared. “The only thing we don't do, and we probably should, I don't know that we've ever followed up to see if the plant survived. And that's probably something that we should have done. We know where they've been sent, and that's a



good start, but we need some way to follow up. If I was setting up a program, doing it over, I would make sure it was somebody's job to follow up on that." He has not yet had to retrieve plants that he has given away. He thinks it would be beneficial to have someone go to the gardens and check on the status of the collections.

The most important part of the program is Magnolia's records. "You have to make sure that the camellia we say is 'Professor Sargent' is 'Professor Sargent'...Especially with camellias, with so many look a lot together, with DNA, the problem is that if I pick a limb off a plant and they pull the DNA it becomes that cultivar forever whether it was or not. That's probably the biggest problem is researching the records to say this is the variety we're saying it is. And that's really, really hard."

If you are trying to preserve a plant, you should have it in gardens in different geographic locations because different varieties will do better in different locations. Plants that are bred for cold hardiness do not do well at Magnolia, but might do well in Norfolk, VA.

"Not just the plant material, but the stories behind the plant material need to be preserved...the story is as important as the plant itself."

"You don't want the organization deciding what variety is worth saving and which variety is not. Everyone has biases and things they like best."

### **Laura Roberts. Van Vleck House and Gardens.**

Laura Roberts is Garden Manager at Van Vleck House and Gardens (VVHG), located in Montclair, New Jersey. It is a historic house surrounded by 6 acres of gardens. The house was owned by several generations of Van Vleck family. Today it is owned by the Montclair Foundation. The gardens are open to the public, but the house is closed and used as offices. The gardens are open year-round for display, education, and research.

They do not have a collections policy. They did not have a plant database until this year when she started a database in order to create a comprehensive tree inventory. She felt like she was in badly in need of a database to record conditions and care and recommendations. They are adding new plantings and she is recording when things are installed. She is in the process of creating that database. For things other than trees, she has nothing in place. She said that it's a goal, but not there yet.

She has a formalized numbering system for the trees. Each tree gets its own number and multiples of the same species or cultivar get an additional letter. She does not keep track of where she got the plant from, only when it was planted. She is using Excel to list plants, numbers, and additional information (condition, care). She uses Google Earth to map or plot locations.

Working with a botanical garden or arboretum "definitely" appeals to her. In the past they have received seeds from Willowood Arboretum and a witch hazel. They have not worked with any other botanical gardens or arboreta.

She is interested in all plants. Not limited to historical plants. History may be a motivation for some of the decision makers on the board, but a new master plant has new plantings to extend the season from spring to year-round interest, so the new plantings could contain plants that have never been on the property. Some committee members are interested in new cultivars to show visitors what is being developed. Others are more geared towards historic or time period appropriate plants. Nothing would be automatically excluded.

She thinks that she would be able to keep track of a plant, but it depends on how the donor garden wants it to be tracked. If there is a particular form "we could certainly accommodate that." They would be able to know its location and health.

“We’re not so large that we wouldn’t be able to find it. If we received it and know where we received it from and that we need to keep track of it, whether it’s yearly or twice a year, we can certainly do that.”

She is a professional horticulturist and so is one other person on staff. They have volunteers.

Probably could not pay for plants. They are on a tight budget.

She would be willing to return a piece of the plant if necessary. “If we got it for free with the understanding that it’s part of the deal, we wouldn’t have any trouble with that.”

In order for an exchange to be win-win, it would need to fit within the master plan or the master planning committee has to be on board with it. She would like cross-over publicity. “They promote us as ‘keepers and protectors of part of their collection’ and we would do something of a similar nature as far as thanking them for allowing us to keep part of their collection on our property.” It would be beneficial to have links to each other’s websites and to promote that this is going on.

What she needs for an exchange or program to be successful “depends on amount of material being kept. If it’s 1 plant or 5 plants, we would be able to handle that without any issues. If it were a large amount of plant material, we might need manpower. Whether it’s funding for an additional staff member to care for the plants and keep records or it’s additional volunteers who are dedicated to that project. But if it’s a small amount of plants, we would be able to handle it with what we have.”

The most important aspect is “the excitement of having a wonderful plant on the property for people to see. As a horticultural institution, it would be a wonderful thing to promote in our publicity and to be recognized in the horticultural community as a partner in the preservation of these plants.”

For the organization, philosophy is important. For her, personally, it would be the ability to propagate the plant and sell propagules at the plant sale. She would be in favor of not having rules or regulations on propagation.

**Tony Shahan. Newlin Grist Mill.**

Tony Shahan is Director of Newlin Gristmill, located in Glen Mills, Pennsylvania. The property is 160 acres, including nature trails, the 1704 grist mill, and other structures. The park has a dual mission of historic preservation and environmental conservation. They do not have historic gardens. There were efforts to recreate them, but deer defeated the purpose.

Shahan is not sure if they have a professional horticulturist on staff. An employee takes care of the grounds, but he might not have horticulture training. 30-40% of volunteers take care of the grounds and landscaping. Some of the volunteers are gardeners.

They are interested in receiving plants if they fit in mission. "I would want to talk about logistics. My concern as a site would be taking the responsibility of safeguarding plants and having something go wrong....Any time you take the responsibility of someone's collection...I would want to make sure we could maintain that. I think we have the staff and volunteers to do that, but we would want to talk a lot more details." Plant care is one of the details he would most want to discuss.

In 1960s, the founder planted 50 Giant Redwood trees. They now only have three. Longwood Gardens approached them for cuttings. Longwood had them sign paperwork. There was an understanding that Newlin would receive some of the plants back.

They have not received any plants from a botanic garden in the past. Trees were donated by an arboretum (but he can't remember the name). He would be interested in

working with a botanic garden or arboretum in the future. “I would need to make sure that we could successfully support and maintain this. That would be my biggest concern. That we aren’t biting off more than we can handle.”

“What is critical is that you aren’t taking on 50 or 100 of them. You’re taking on a few of them, a handful.”

They would be able to keep track of plants and report on plant health on an annual basis. They are creating a new collections policy with a living collections policy that will include major specimen trees and landscape features. Received plants would go in that collection.

Paying a fee would depend on the plants he received. “Paying a fee isn’t a deal breaker. It would come down to the amount and the value to what we’re trying to do and how it fits in an overall scheme.”

He would be willing to return a piece of a plant if needed. “That part of the process is what intrigues me most about this plan. I think it’s a great way of safeguarding these collections and could be a way to connect the environmental and natural with the historic.”

To make a plant exchange win-win, “the purpose must fit into the goals of my organization. Those are going to switch from organization to organization, but the key to it is finding groups that have the goals that you’re looking for.”

The most important part of the program is the agreement and making sure the parameters are well laid out so that both parties know what is in the arrangement. He would like regular contact, maybe every 6 months. He proposed an automatic email or some type of reminder. He would like to have backup or technical support if necessary.

To ensure the success of the program, Shahan would need to make sure that he had enough staff. He said “It’s not a problem, but an allocation of resources. Someone has to be dedicated to the care and upkeep of that particular loan.”

He said that a lesson he learned from English Lester sheep breeding is that a program can’t be individually tied—it has to be organizational.

### **Quill Teal-Sullivan. Meadowburn Farm.**

Quill Teal-Sullivan is Garden Manager at Meadowburn Farm, a historic garden and dairy farm located outside Vernon, New Jersey. It is 593 acres, six of which are gardens. It is on the National Register of Historic Places. The gardens were designed and installed by Helena Rutherford Ely, a notable garden writer in the early 20<sup>th</sup> century. Meadowburn Farm is privately owned and operated but is in the process of becoming more open to the public. Part of its mission is to preserve the historic cultivars that are still found in the gardens.

Teal-Sullivan considers herself a professional horticulturist. There is no other fulltime staff working in the gardens. There is a summer intern in 2014.

Receiving plants would fit within mission. She would only accept plants from the Ely era or a genus or species of which they already have a collection. She is also looking for

“regional heirlooms”—old plants that are grown in local gardens or are iconic of the region.

Meadowburn does not yet have a collections policy.

They have historic dahlias, a tulip, lilacs, peonies, *Phlox paniculata*, Rose of Sharon, *Philadelphus*, *Spirea*, bearded iris, balloon flower and daylilies. She is not entirely sure how old these plants are.

She has given dahlias to different people to safeguard them. She gave dahlia tubers to the American Dahlia Society for their garden at the Bayard Cutting Arboretum on Long Island. The goal was to have a backup collection in the hands of someone who is capable of taking care of them and for research purposes, so that he could propagate them and help in identifying them. She gave a full set of dahlia tubers to a dahlia collector in NY. Also sent two tulip bulbs to Old House Gardens for identification.

There was no formal agreement when she shared plants. There was a verbal understanding/conversation between Quill and American Dahlia Society representative for him to help find a market for the plants and identify them. For the private collector, she just gave them to her for her garden. Tubers were given without an understanding that they would be returned if needed, but Quill assumes they would. How long they will keep growing the tubers was not discussed.

She is now aware of Meadowburn having received plants from an arboretum or botanical in the past. She would “absolutely” be interested in working with an arboretum or botanical garden in the future.

She thinks she would be able to keep track of plants well enough to return them if needed. She could report back on condition of plant to original institution. She does not have a plant database. There is no one else to help with record keeping.

She would not pay a fee for plants or shipping.

To make an exchange win-win for Meadowburn, she needs support from the botanic garden or other institution. “I imagine they would have more resources than a small garden, whether those are financial or intellectual capital or people on staff who can assist in setting up the collection here. As far as a fee goes, unless there was an even trade, like we were giving tubers from our collection, and they were going to care for them, there should be some support or help covering the cost of caring for their

collection. Another way to be reciprocate for the time we would put into the collection they could have professional development opportunities at an institution or training opportunities. There would have to be something to make the time and finances to keep that collection worth it. So it's not a burden."

If she was given plants that she already wanted, "That might be different. BUT, if they were asked to report back, or care for them in a certain way, or keep records on them, then in that case we would want their technical support or opportunity to get further training from their staff. If it's like getting 5 more peonies, then I don't think we would need financial support."

The most important aspects to an exchange would be "really clear communications about the expectations for both parties. Making sure they aren't introducing new diseases or viruses (maybe an inspection?)."

"Having some sort of database with the other institution's database would be awesome and important. We probably wouldn't need extra staff, but a database, a model, guidelines, or example contracts, a list of things to consider, or questions to ask, or concerns that might arise, would be really helpful."

"One thing that would make this idea really valuable to us, would be for us to be able to put our collections in a botanic garden, too. If a botanic garden were to give us five peonies, I would love to give them five peonies, or lilacs, or dahlias. Maybe the reciprocation would be if there is research going on at the botanic garden, then maybe they could help us identify our plants."

### **Chris Ward. The Trustees of Reservations.**

Chris Ward is Superintendent for the Trustees Ipswich for The Trustees of Reservations (TTOR), a state-wide non-profit organization in Massachusetts. Its mission



reads, "The Trustees of Reservations preserve, for public use and enjoyment, properties of exceptional scenic, historic, and ecological value in Massachusetts." TTOR owns and manages 112 properties, including natural lands and historic sites. The state is broken into management units. Ward works for the Ipswich Management Unit and oversees 4-5 properties.

TTOR has a wide variety of properties and resources they oversee. Ward cannot speak for all of them. Each property is different.

The Greenwood Farm in Ipswich owns 2100 acres, 200 associated with historic home. Most of the gardens are just remnants. There is some discussion of bringing back the gardens.

The Stevens-Coolidge property has restored gardens including perennial, rose garden, and potager. The perennial garden has changed over time s different gardeners have left their marks. The rose garden rehabilitated in 1989-90 and the potager restored in 2003. At Stevens-Coolidge, the gardens have changed over the past 100 years, so they will not pick a date to restore to. The gardens are a mix of older plants and ones visitors expect.

Original plant selections are important to TTOR but each site has different levels of historic documentation. When TTOR has documentation, it likes to follow that as much as possible and plant or replace things with the same variety or cultivar.

Across the organization, there are 4-5 horticulturists. They are spread out across the state. They do not have horticulture degrees, but has studied something related. Otherwise, field staff or volunteers maintain the grounds.

Most of the plant material that they can identify as historic or iconic is the trees. The gardens deteriorated in the mid-20th century because they did not have the financial or staff resources for maintenance. Now they are trying to bring them back.

More likely that they would be looking for plants rather than giving them away.

TTOR has received plants from a botanical garden or arboretum in the past, but Ward was not involved. He does not know the details. When they restored the rose garden at the Stevens-Coolidge house, they used roses from New York Botanic Garden. They were gifted; no agreement was made.

TTOR would be interested in working with a public horticulture institution. They would be able to keep track of plants and report on plant health.

Plant records vary by site. Some have very detailed, some have less detailed. Some use hand-drawn maps and Excel spreadsheets, others use Access. He “cannot be confident” that every plant that goes in the ground is recorded.

They do not accession plants. TTOR receives so few plants that it does not have a formal plan for accepting them. “As long as a gift came in, I think we could certainly document how it’s doing, as long as we had the protocol in place to do it. To understand at the time we receive it what the expectations were and how we would execute the documentation.”

TTOR could “definitely” pay a fee and would return cuttings or divisions.

The biggest challenge for TTOR is figuring out the network and where plants are available. Right now he relies on google, but that does not necessarily bring up plants at botanic gardens. At Stevens-Coolidge, they have tried to find historic plants but their searches have not turned up a lot. Having a database or listserv of which gardens are willing to share and what is accessible “would be huge.”

The date a plant was introduced does not necessarily matter. TTOR owns 112 properties, and each has its own history. “It really runs the gamut...where we try to interpret a specific period of significance...other properties might have a lot more freedom of what we can accept. It’s hard to say from an organizational perspective.”

The most important part of an exchange is “the expectations on returning the plant. Whether it’s a cutting or the whole plant.” He would like clear expectations of what is returned and what needs to be documented. “If the documentation is too cumbersome, we might choose not to accept it. There needs to be a good balance on what we’re expected to do.” He would like an MOU or mutual agreement with clearly lined out the expectations. He wants that “up front.”

“Our organization has looked for plants, tried to find plants. We want to do our due diligence and put back the historic fabric of our properties, and we hit a lot of road block trying to find those plants. There is a financial aspect or hurdle that we’ve also experienced because, as you try to buy these plants on the open market, they cost a lot of money. A loan program, even with a small fee attached to help with maintenance on the giver’s side, that would be fine as long as it was less than market value.”

#### **Rebecca Wilson. Old Swedes Church.**

Rebecca Wilson is the Executive Director at Old Swedes Church, located in Wilmington, Delaware. It is a National Historic Landmark church, constructed in 1698-1699. It is owned by the Episcopal Diocese of Delaware and services are still held in the church. The burial ground that surrounds the church dates back to the 1630s. It is a 17<sup>th</sup> century cemetery moving forward to present day. On the property is a Swedish farmhouse, a labyrinth, and a small amphitheater. The mission is to preserve and maintain the historic grounds for historic purposes and to provide tours and various educational programs for the site.

They are trying to preserve the buildings to this point in time. The buildings are not being altered—they are preserved in the technical sense (the National Park Service definition).

The grounds “we are just trying to keep them up.” In 1980s, they hired a landscape architecture firm to develop a plan for the grounds. She isn’t sure how much of the plan was followed. In the 1990s and 2000s, they put in new sycamores as old ones died. They recently lost two trees that were over 100 years old. “Our whole landscape is changing because we are losing the old sycamore trees.”

The organization would like to maintain the site in the 19<sup>th</sup> century style graveyard.

They are not sure if they want to replace like with like. They might replace with hardier trees that will produce wood that they can sell.

They have a landscape plan, but they have not followed through with it. She feels they need to do something. A plant exchange would help her “create a better landscape.” She keeps track of what has died by marking it on the plan.

There are no landscape staff or volunteers. They have a company that takes care of the grounds and will tell her if something is wrong.

Receiving plants could fit within mission. They could pay a modest fee.

They have not worked with a botanic garden or arboretum in the past, but she would like to in the future. They would be able to keep track of plants received. They could put them on the map or in an Excel file. They can also use Past Perfect.

She could report back to the original institution if a plant died. A staff person would be the person to report back. It would probably be the executive director.

Would be willing to return part of the plant to the original institution. “If there is enough to give back.”

She has never taken part in something like this. She would like to be able to put the proper plants around her site. “It would be so nice to be able to continue to have the

types of plantings we had. It's one of the things that makes this site so unique. When people come here, they think of it more as a park then as a cemetery."

The most important part of an exchange program would be "being able to have access to professional horticulturists or their staff and talking about these plants and what we would need to do to upkeep them. I assume that they would give you that basic information or if you had an issue that you could call them."

To ensure the success of the program, she would need "advice from the donating institution. Or even collaboration with interns if they do that kind of thing. Being able to put in heirloom or heritage plants would be great." Volunteers might also be necessary.