INSTITUTE of Museum and Library SERVICES

Wednesday, June 21, 2017

20 Years

Successful IML Grants: A Tale of Three Gardens

American Public Garden Association Annual Conference

Hamilton, Ontario

Today's Agenda

- Introduction to IMLS
- IMLS Museum Funding Opportunities
- Q&A

Institute of Museum and Library Services

Reimagine the Future

About the Institute of Museum and Library Services

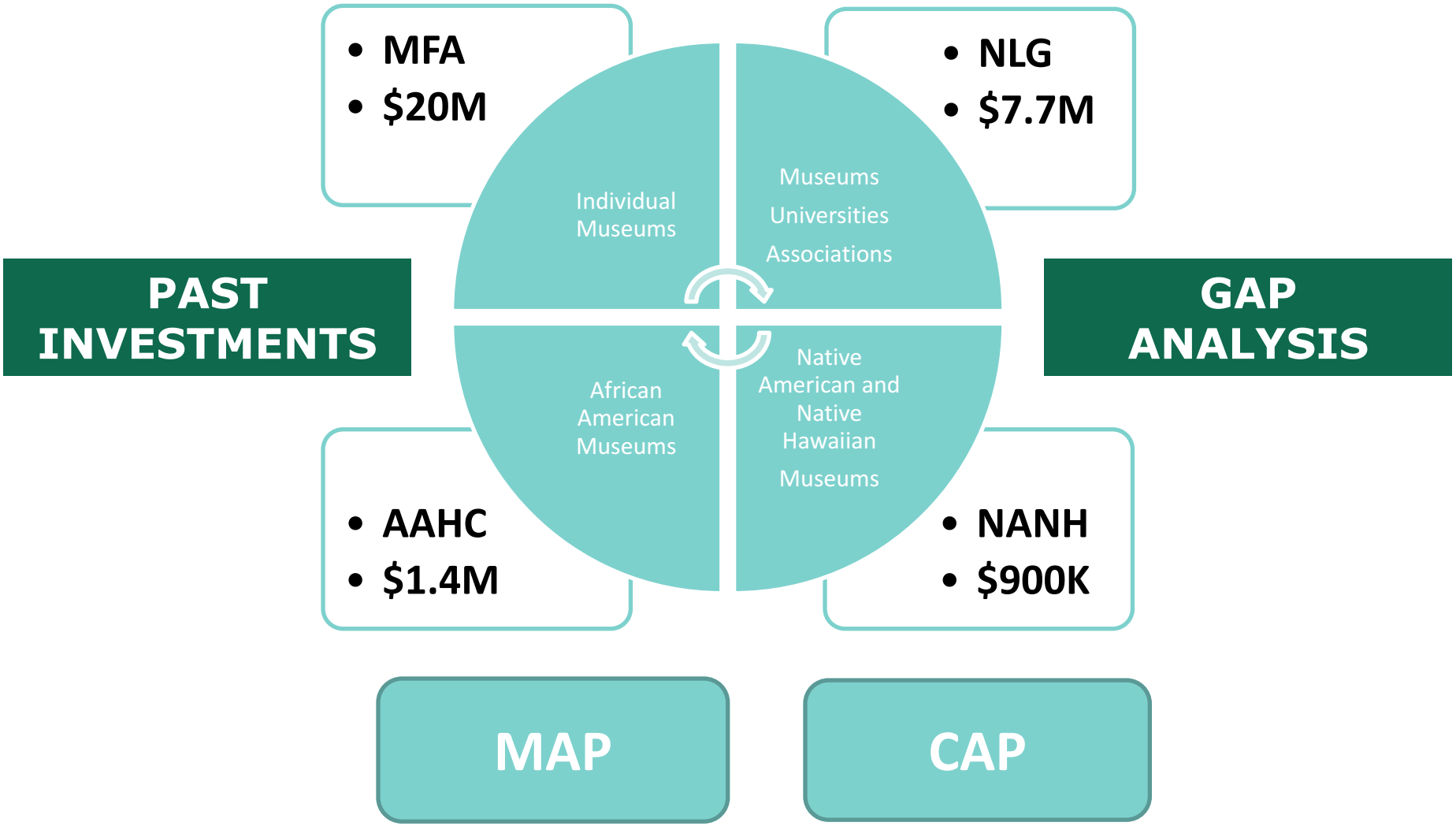
Who are we?

- IMLS is an independent federal grant-making agency and the primary source of federal support for the nation's approximately 123,000 libraries and 35,000 museums and related organizations.
- The Institute of Museum and Library Services (IMLS) helps ensure that all Americans have access to museum, library, and information services.

What do we do?

- We make **grants, convene groups, conduct research,** and **publish** in order to build the capacity of museums and libraries to serve the public.

A Comprehensive Strategy



Office of Museum Services Priorities

1. Museum Professional Development

2. Building Digital Capacity

Museum Funding Opportunities

1. Museums for America
2. National Leadership Grants for Museums
3. Native American/Native Hawaiian Museum Services
4. Museum Grants for African American History and Culture
5. Museums Empowered

Museum Grant Opportunities

	Museums for America	National Leadership Grants	Museums Empowered
Program Goals	To strengthen the ability of individual museums to serve the public	To address critical needs of the museum field and advance museum practice	To invest in professional development of museum staff
Project Categories	• Learning Experiences • Community Anchor • Collections Stewardship	• Advancing Digital Resources • Collections Care & Access • Diversity & Inclusion • Professional Development	• Digital Technology • Diversity & Inclusion • Evaluation • Organizational Management
Funding Levels	$5,000-$25,000 (no cost share)	$5,000-$50,000 (rapid prototyping; no cost share)	$5,000-$25,000 (no cost share)
	$25,001-$500,000 (1:1 cost share)	$50,001-$1,000,000 (non-research; 1:1 cost share)	$25,001-$250,000 (1:1 cost share)
		$50,001-$1,000,000 (research; no cost share)	
Deadline	December 1, 2017	December 1, 2017	March 1, 2018

Characteristics and Eligibility

Museums for America And Museums Empowered	National Leadership Grants
Characteristics of Successful Proposals	
Institutional Impact	Broad Impact
In-depth Knowledge	In-depth Knowledge
Project-based Design	Innovative Approach
Demonstrable Results	Collaborative Process
	Shared Results
Eligibility	
Museums	Museums
	Higher Ed
	organization advancing museums and the museum profession

Museums for America (MFA)

Program Goal	To strengthen the ability of individual museums to serve the public	
Project Categories	▪ Learning Experiences ▪ Community Anchors ▪ Collections Stewardship	
Deadline	December 1, 2017	
Funding Levels	$5,000-$25,000	$25,001-$500,000
Cost Share	None permitted	1:1 required

Activities can include:

- School and public programs
- Exhibitions
- Collections management
- Collections care
- Conservation
- Digital media development & delivery
- Publications
- Training
- Community outreach
- Audience research and evaluation
- Planning
- Database development
- Digitization

Museum Grant Statistics

2016 MFA Grants:

- Number of eligible applications: 506
- Total dollar amount requested: $57,137,783
- Number of grants awarded: 206
- Total dollar amount awarded: $21,149,000
- 41% of eligible MFA applications funded

2016 NLG Grants

- Number of applications: 60
- Total dollar amount requested: $21,477,200
- Number of grants awarded: 13
- Total dollar amount awarded: $5,185,106
- 22% of NLG applications funded

Recommended Next Steps

1. Visit www.imls.gov to select a grant program and verify your eligibility.
2. Read the Notice of Funding Opportunity carefully.
3. Check your organization's registrations with both SAM.gov and Grants.gov.
4. Connect with us
   - Participate in free IMLS webinars.
   - Talk with a program staff member at any stage.
5. Prepare your application. Make sure it's complete.
6. Submit **before** the deadline, December 1, 2017 (by 11:59 pm ET)

Helpful Links for Applicants

- IMLS Website: **http://www.imls.gov/**
- Notice of Funding Opportunities: **https://www.imls.gov/grants/apply-grant/available-grants**
- Search Awarded Grants: **https://www.imls.gov/grants/awarded-grants**
- Sample Applications: **https://www.imls.gov/grants/apply-grant/sample-applications**

Contact Information

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Office of Museum Services

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202.653.4667

20 Years

Thank you and good luck!

Successful IMLS Grants: A Tale of Three Gardens

Making Your Case

Linda Eirhart
Director of Horticulture, Senior Curator of Plants
Winterthur Museum, Garden and Library

American Public Gardens Association Conference 2017

What was the difference?

- Better Planning
- More Details
- Complete

Make a solid case for support

- Why are you important?
- Why is project important?
- How will you implement project?

- How will you measure progress/success of project?

Why are you important?

- Who are you?

- What is your collection?

- Cultural/Historical significance

Why is the project important?

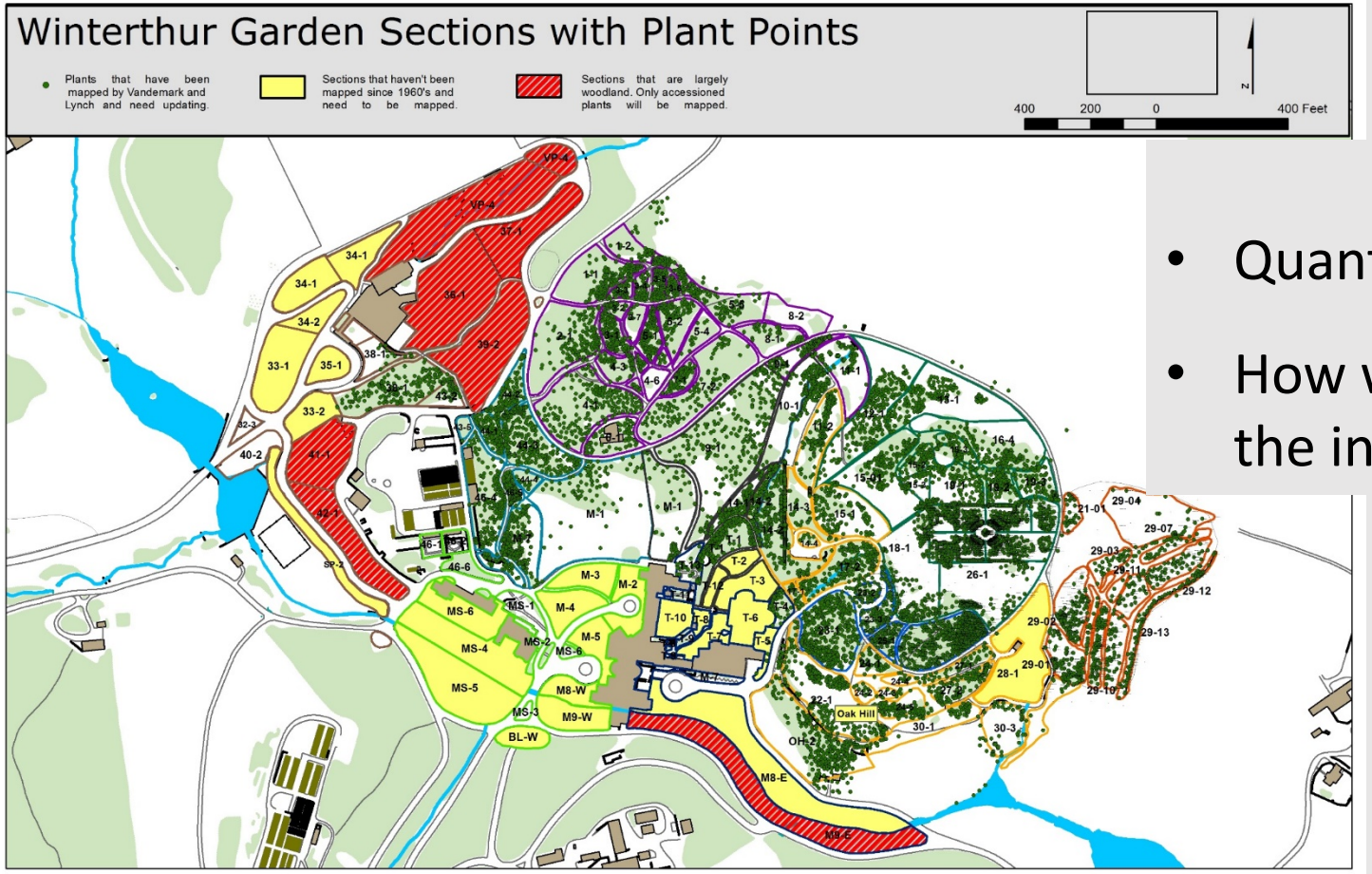
- How does it relate to your mission?
- How does it build on previous work?
- How will it be sustained?

How will you implement the project?

Detailed Plan

- Staff involvement
- Process/timing – do a trial run
- Quantify work

How will you measure progress and outcomes?

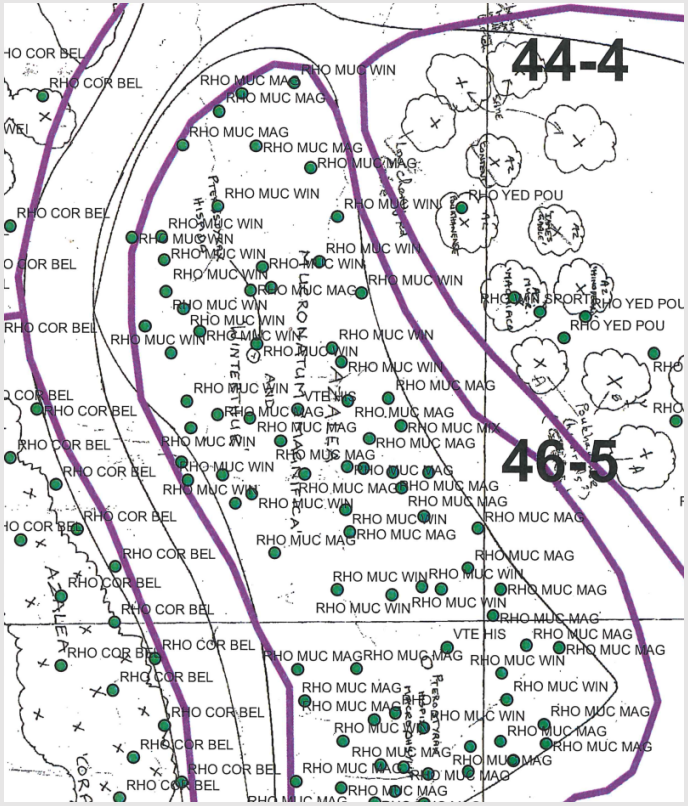


- Quantifiable
- How will you use the information

Review

- Why is your organization important/relevant?
- Why is this project important/relevant?
- How will you implement the plan?
- How will you measure progress/outcomes?

IMLS Direct Impact at Winterthur



- Plants digitally mapped in GIS
- Plant records updated
- Historic maps geo-referenced

IMLS Indirect Impact at Winterthur

- Elevated importance of garden collection
- Permanent GIS mapping specialist
- Staff commitment to plant records
- Aid in plant identification and historic design
- Plant Records Intern – career enhancement

Top Three Recommendations

- Project – selection and description
- Planning – importance of trial run
- Be Thorough – answer every question

Successful IMLS Grants: A Tale of Three Gardens

Bellevue Botanical Garden

Nancy Kartes, Garden Manager

American Public Gardens Association Conference 2017

Bellevue Botanical Garden

- Small garden with limited staff
- Must be very strategic about IMLS grant-funded projects

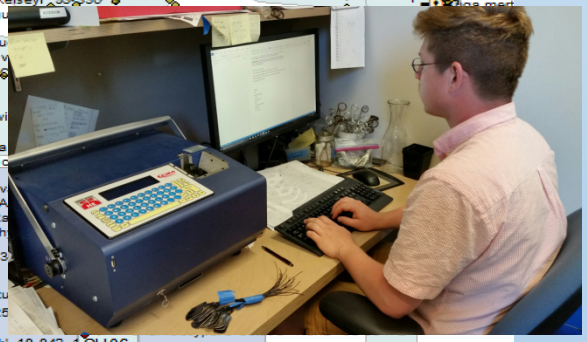
Identifying projects that are compelling and timely…

- IMLS grant projects must be integral to our strategic plan and current garden development.
- As grant writer and grant director, I have to be sure that I have capacity to successfully implement and manage the project for the duration of the grant.

IMLS Grants at BBG

- 2008 Update Master Plan
- 2009 Begin Visitor Center capital campaign, Apply for first IMLS grant
- 2010 - 2012 Collections Stewardship – laying the curatorial foundation
- 2013 Break Ground on new buildings
- 2013 - 2016 Learning Experiences – sharing information with the public
- 2014 New buildings open to public with new signage, interactive visitor map, and other tools provided by the grant
- 2015 Build content for interpretive signs and audio tour
- 2016 Evaluation phase
- 2017 Visitor Experience evaluation continues

2010 Collections Stewardship – laying the curatorial foundation.

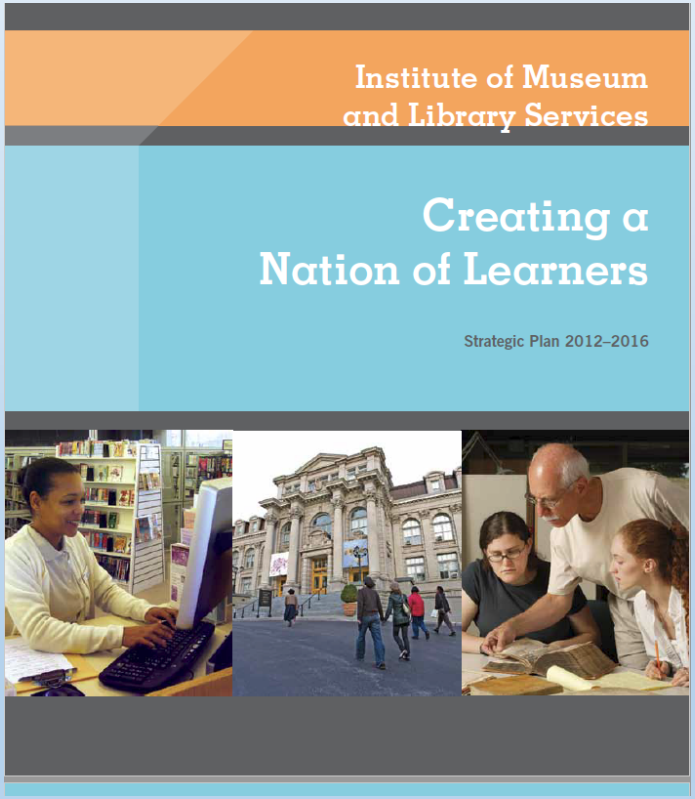


2013 Learning Experiences – sharing information with the public

2013 Learning Experiences – sharing information with the public

Identify Projects That Align with IMLS Funding Objectives

- IMLS strategic plan
- Understand that they are responsible for measurable impacts of their grants



IMLS Objectives

Highlight: Connecting to Collections

Connecting to Collections is a call to action in response to the alarming findings of *A Public Trust at Risk: The Heritage Health Index Report on the State of America's Collections,* an IMLS-funded study that for the first time documented the state of the collections that museums and libraries hold in public trust. *Connecting to Collections* prioritizes safe conditions for collections, emergency plans, accountability, and leveraging private and public sector support.

Highlight: Digital Collections and Content

Working with the nation's top researchers and digital curators, the University of Illinois at Urbana-Champaign has developed a test bed

Objectives:

Support the care and management of the nation's collections, both material and living, to expand and sustain access for current and future generations.

Develop and implement a nationwide strategy to expand the public's access to the information, meaning, and content found in museum and library collections.

2012 IMLS - Engaging Communities

Build on: IMLS-CS grant work

- updated, verified data
- upgraded delivery tool (on-line searchable data base)

Summer 2012 (capstone)

Explore 4Culture Grant 12/12 for 4/13

- * 21st century Learner
- * Life-long, informal learning
- * Engage visitor & engage community in re-purpose
- * Audience centered learning programs

Next Steps: for Ed/Interp.

- Use data to create story
- gather historical info " " (UW Museology student project) cost share
- audience analysis
- content development
- Archive plan/digitizing development & implementation (UW Information Sciences project) cost share

Partner w/EHC?

- Research & procure equipment for electronic delivery on-site (electronic wall, add'l stand alone stations) (IMLS Funding)
- Create signage about how to access info on cell phones/Ipads/etc. (cost share)
- Cell phone tour signs & handouts (IMLS)
- Develop "visitor friendly" versions of atlases for access electronically/maps to specific areas of interest. (UW GIS project cost share)

Strategic plan: grant work begin in ~~Aug~~ Fall 2013

Conduct research, archive, content dev. etc. while VC under construction - 2 yrs (phase 3 projects over time)

All deliverables ready to roll out Fall 2015 w/or in advance of building opening

Grant Deadline: ~~october 2012~~ January 2013

Do: Develop project outlines
contact UW Museology ✓
UW Info. Sciences ✓
UW GIS
EHC
} Letters of support/commitment

Develop grant budget
Est. BB&S project "champion"

BBG – education/interpretive program logic model draft

Situation: BBG needs to provide multiple layers of visitor engagement with plant collections, horticultural practices, and BBG story without detracting from beauty or garden design.

Assumptions:

- Some visitors come to BBG to learn about plants, gardening, and the BBG story
- Some visitors come to BBG to enjoy the beauty, seek respite, and/or get fresh air and exercise in a healthy, beautiful setting
- Some visitors come to BBG to socialize and/or connect with others who share their interest in gardens and gardening.

Inputs	Activities	Outputs	Outcomes
Plant Collections/ Gardens Staff Volunteers Partner Groups Computer Equipment Signage Print Materials Plant Labels Maps Online Searchable Database Partner group web-based content Class supplies and equipment Education Center Visitor Orientation Room	Docent-led tours Horticultural volunteer program Partner group work/learn parties Living Lab children's education program Maintain plant records for sharing with public Oral histories/story of Garden Interpretive signage program Adult education program BBG staff and volunteers demonstrate best practices	x # of docent tours per year x # of hort. vol. hours per year x # partner group work parties per year x # of Living Lab classes per year, y # of students served x # of interpretive signs in gardens x # of Tap/Scan portals in gardens x # of hits to web content x # hits to interactive Tap/Scan x # of hits to audio tour x # of Natural Yard Care program participants x # other Ed. Program participants x # docent training hours x photography permits % plants in collection that are Great Plant Picks	ST – Garden visitors use the Garden as a resource for information about best plants and gardening practices for Northwest gardens. LT – Inspired, informed, engaged citizens, visitors and volunteer s who express creativity, learn new skills, and enjoy the outdoors (COB outcome) LT – We are a nation of learners with 21st Century skills, with cultural institutions that provide informal learning experiences that are inclusive and accessible. (IMLS outcome) LT – Vibrant, beautiful communities that support a healthy ecosystem. (BBG vision)

Schedule of Completion
Grant Year One

Activity	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sept
Grant announcement, build grant infrastructure												
Content inventory												
Formative evaluation, visitor survey												
Oral history interviews & transcription												
Interactive map tech work												
Webpage content development												
Webpage/ Map graphic design												
Test map and web page content via website and focus groups												
Submit first IMLS annual report												

- **Schedule of Completion - Grant Year Two**

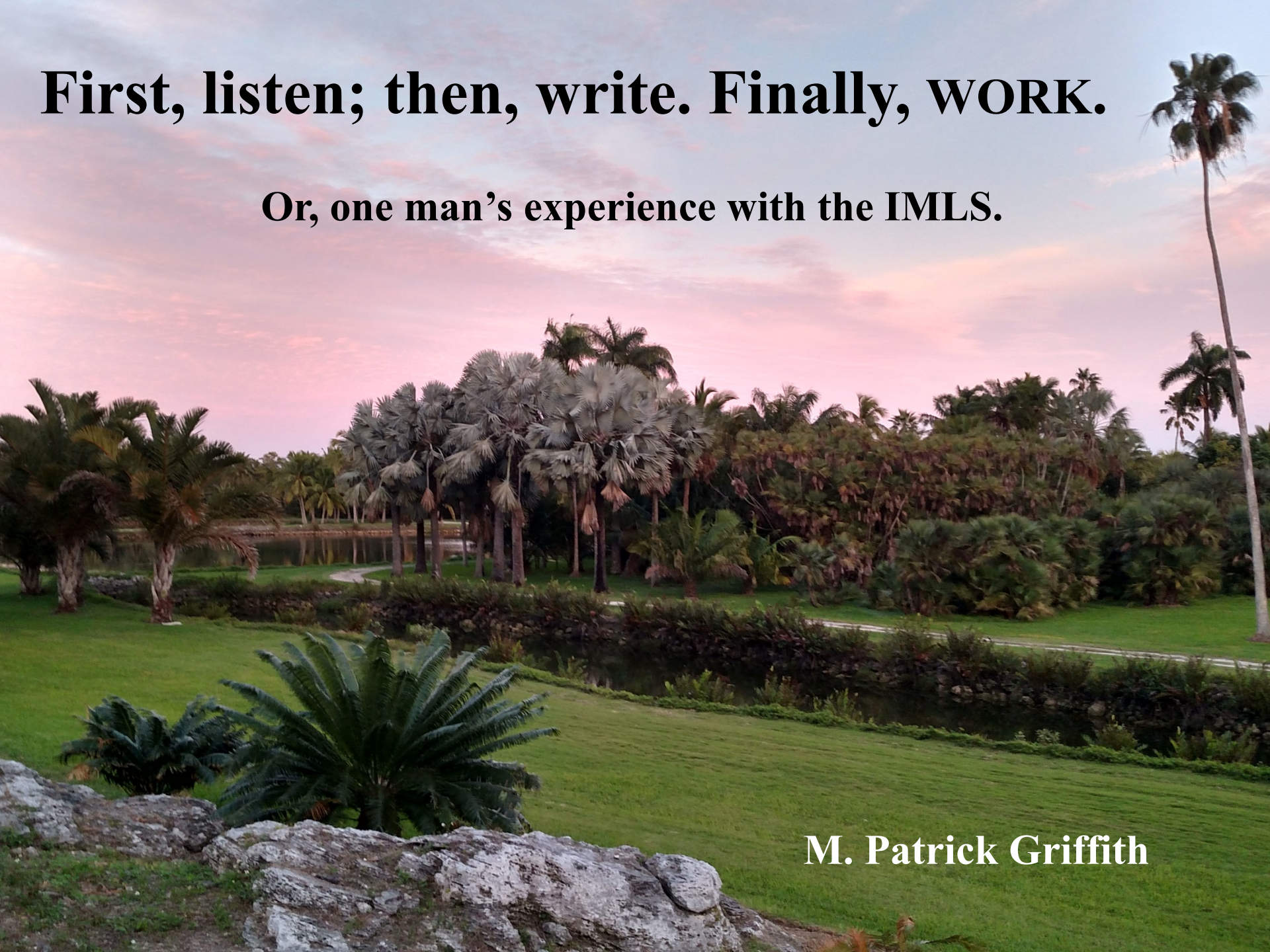
Activity	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sept
Evaluate, revise, retest map and webpages												
Publish final copy to web, record and activate audio tour												
Sign and point of interest marker fabrication												
Procure & Install computer equipment												
Install signage, point of interest and bed markers												
Education Center Grand Opening												
Visitors use new interpretive program												
Submit second IMLS Annual Report												

Impact

- Plant Records systems now in place to help us stay current
- Foster a culture of evaluation and continuous improvement
- Help us achieve our mission - Current Visitor Survey Results: 97% of visitors surveyed perceive the Garden as a resource for information about best plants and gardening practices for Northwest gardens.

Nancy's Top 3 Suggestions

- Confirm everyone on the project implementation team has capacity to devote the correct time to the project for the duration of the grant. Success will depend on everyone doing their part at the right time.
- Remember that you will be accountable for project performance measures and cost share obligation - so draft them with care and forethought.
- Read and heed peer reviewer comments.


First, listen; then, write. Finally, WORK.
Or, one man's experience with the IMLS.
M. Patrick Griffith


Today's
Material

Today's Material

1. What we've done.

Today's Material

1. What we've done.
2. How we got there.

Today's Material

1. What we've done.
2. How we got there.
3. Lessons about writing.

Today's Material

1. What we've done.
2. How we got there.
3. Lessons about writing.
4. Lessons about leading.

Today's Material

1. What we've done.
2. How we got there.
3. Lessons about writing.
4. Lessons about leading.


Montgomery Botanical Center
Miami, Florida, USA
MBC

Past Projects:

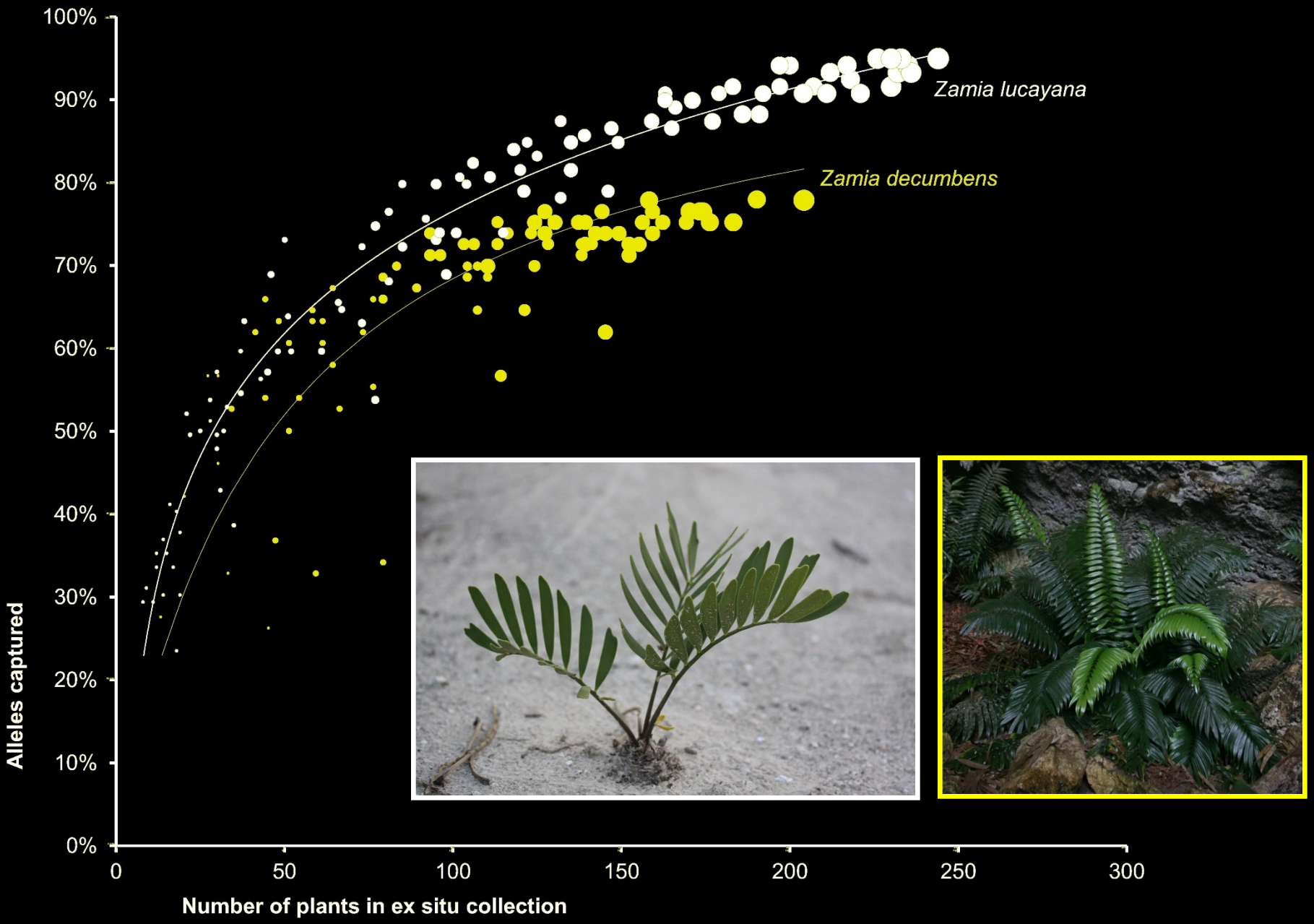
Mission-Based Collections Planning **(2012-2013)**
Mission-Based Collections Stewardship **(2014-2015)**

Past Projects:

Mission-Based Collections Planning **(2012-2013)**
Mission-Based Collections Stewardship **(2014-2015)**

Objective:

model for ex situ cycad genetics


100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Alleles captured
0
50
100
150
200
250
300
Number of plants in ex situ collection
Zamia lucayana
Zamia decumbens

Building living plant collections to support conservation:

A guide for public gardens

The rare Sinkhole Cycad, Zamia decumbens in the wild in Belize

The foundation of public gardens is built on the amazing diversity of the world's plants, yet today more than 20% of plant species are in danger of extinction.

power to ensure extinction isn't an

Guide (2014)

Download from
bgci.org
or
montgomerybotanical.org

BGCI

Guide (2016)

Download from
bgci.org
or
montgomerybotanical.org

BGCI

Cycads:
A model group for *ex situ* plant conservation

Endangered Dioon spinulosum with near mature female cone

Public gardens collectively cultivate, study and protect at least one-third of Earth's plant diversity. One in five plant species now faces extinction, and many species already survive solely in "off-site" *ex situ* living collections. The global safety net of gardens which serves to prevent plant extinction is rapidly growing in breadth and depth, and at least one-third of threatened species are reported in living collections today.

To meet the goals of the Global Strategy for Plant Conservation, the plant conservation community can leverage their collections to build integrated plant conservation programs. Using existing *ex situ* plant diversity as a foundation, public gardens are increasingly working together to build genetically diverse living collections as a global safety net against plant extinction.

Cycads are the most threatened plant group [illegible] face considerable

Zamia lucayana survives on just one beach habitat on one island

National Leadership Grant

Safeguarding Our Plant Collections (2016-2019)

Jordan Wood, Jeremie Fant, Taylor Callicrate, Andrea Kramer, Kay Havens, Tracy Magellan, David Lorence, Matt Lobdell, Seana Walsh, Murphy Westwood, Sean Hoban, and Patrick Griffith.


Leadership
MBC


National Leadership
BROOKFIELD ZOO
Chicago Zoological Society
Inspiring Conservation Leadership
The Morton Arboretum
CHICAGO BOTANIC GARDEN
The ARNOLD ARBORETUM of HARVARD UNIVERSITY
BGCI
Plants for the Planet
Center for Plant Conservation
MBC
USDA
NATIONAL TROPICAL BOTANICAL GARDEN


(Inter) National Leadership
BROOKFIELD ZOO
Chicago Zoological Society
The Morton Arboretum
The ARNOLD ARBORETUM of HARVARD UNIVERSITY
CHICAGO BOTANIC GARDEN
BGCI
Center for Plant Conservation
MBC
USDA
NATIONAL TROPICAL BOTANICAL GARDEN
JARDÍN BOTÁNICO NACIONAL "Dr. Rafael Ma. Moscoso"
Belize Botanic Gardens

Safeguarding our plant collections

What is the best way to conserve plants in a garden?

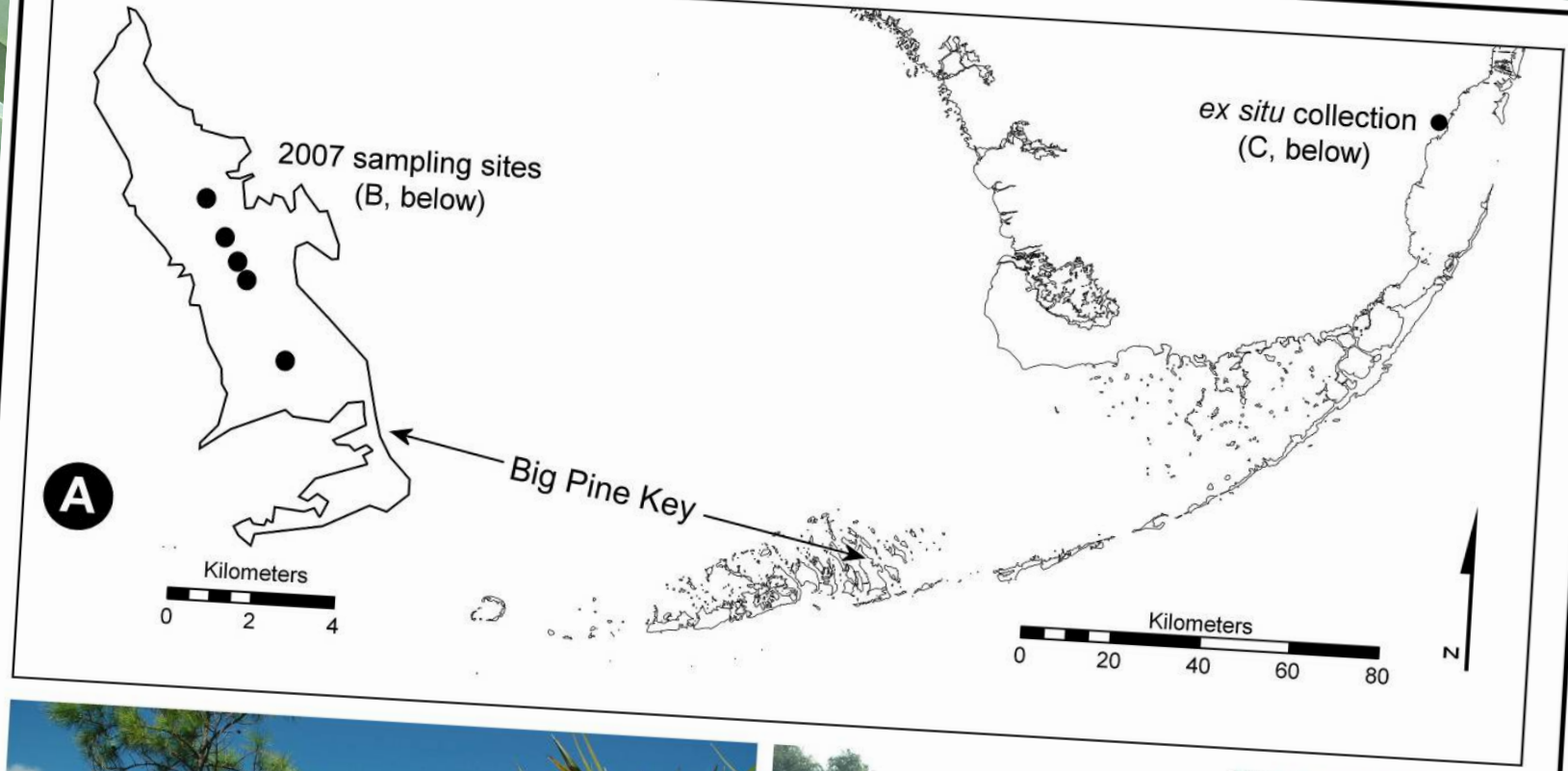

1. What we've done.
2. How we got there.
3. Lessons about writing.
4. Lessons about leading.

1. What we've done.
2. How we got there.
3. Lessons about writing.
4. Lessons about leading.

→ Improved collections management through science


1. What we've done.
2. How we got there.
3. Lessons about writing.
4. Lessons about leading.

2006: First study with palms.



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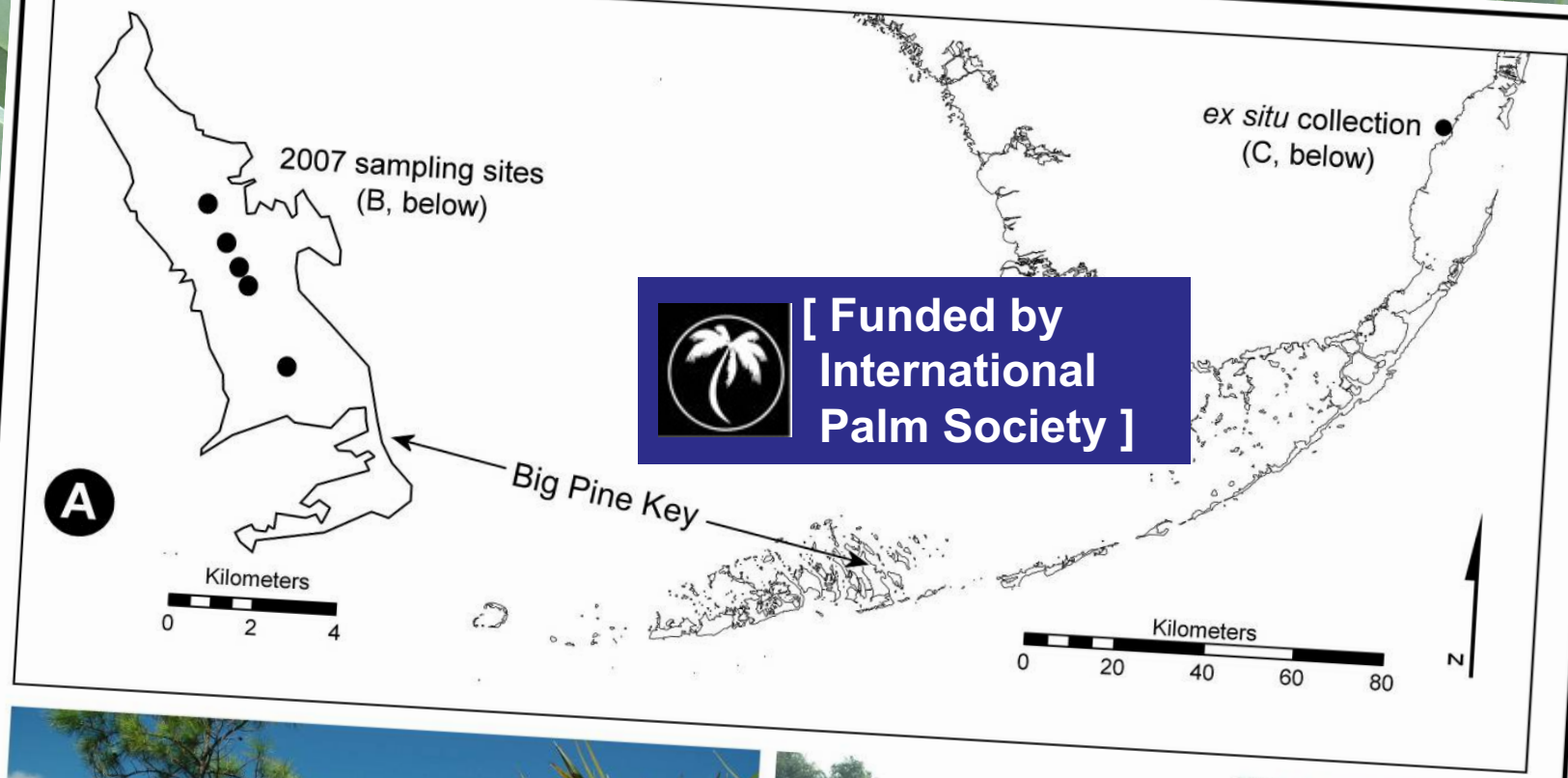


[Funded by International Palm Society]

2006: First study with palms.
2010: First National Leadership Proposal.

Narrative of Proposal

Assessment of need

Just months ago, the IMLS completed an important National Tour, centered on the nation's collections. A keystone piece of our collections heritage is the nation's living collections, which were the subject of an in-depth forum held in San Diego in early 2009. A key theme brought out during this forum is the high value for conservation represented in our living collections. The salient crisis remains the accelerating, unprecedented loss of the world's living diversity – extinction of species and populations continues.

During this same time span since the living collections forum – from early 2009 until now – the nation's collections have seen an intense shortage of the staffing and resources needed to care for this national living collections heritage. The fiscal squeeze has prompted an ongoing quest for the absolute greatest efficiencies in living collections management.

Living collections are very well established as an essential part of species conservation. Investment in these living treasures is essential, but resources are scarce. **Therefore, a clear understanding of the relationship between investment and outcomes is necessary.** While large efforts have been made in conserving biodiversity in living collections, the efficiency of this work has not been closely examined.

Developing a set of metrics for measuring conservation value of living collections, applying the most advanced tools for gathering these metrics, and placing these data within an easily understood context of resource investment vs. conservation outcomes will satisfy this need. The tools, methods, and models developed through this project will allow living collections to apply efficiency models to the conservation operation. This will allow each dollar invested in conservation to have the greatest possible outcome.

Audience needs and benefits

Briefly stated, botanic gardens need a clear yet robust model demonstrating the relationship between investment and outcomes with regard to collections conservation work. This project will benefit botanic gardens by enabling realistic and pragmatic budgeting to be as effective as possible in achieving conservation goals.

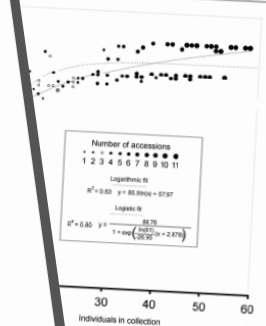
Meeting conservation goals in an effective and efficient manner is important for all living collections. For zoos and aquaria, there has been significant research that can be directly applied, mostly in the area of minimum viable population studies (DeSalle and Amato, 2004). Population and metapopulation management plans for living animal collections have had a moderate level of development. The current research will produce a broadly applicable model to enable exploration of the relationship between investment and conservation outcomes for plant collections.

Following the successful example of zoos, botanic gardens increasingly work to cultivate rare plant species for the purpose of *ex situ* conservation. Strategies for conserving living plants vary among and within garden collections (Wyse Jackson & Sutherland, 2000; Anonymous, 2002; Havens *et al.*, 2004a, 2004b; Farnsworth *et al.*, 2006). Much progress has been made among

inary model

nderway at MBC has produced a preliminary model for exploring the relationship collections efficacy, cost, and efficient application of resources. For the y, we explored the population genetics of an extensive living collection of Keys *ucothrinax morrisii*), derived from a single collecting event on Big Pine Key, arch team re-visited the original wild population, and compared the population llection and the wild population. Through a method of structured randomized collection's genetic data, we modeled the effective conservation value of living ous sizes (Figure 1, below). This work was designed to inform sampling collecting work.

ere is consistent with: 1) collections of more than one individual conserve ity; 2) as collection size increases, the increase in genetic capture increases and 3) there is a point at which increased investment in a collection (as nts maintained) does not appreciably increase the conservation value of the study, this relationship was well described by a logarithmic function. This "collection conservation curve."



effective genetic capture of a botanic garden living collection is graphed ividuals in the collection. The graph shows the law of diminishing marginal returns (on Value) as the investment (in numbers of plants) increases.

gs to a thorough review of spending on costs (in constant 2007 dollars) incurred to the collections and curate the data each year of variable size was calculated from these investment over the life of the collection the plants) and the efficacy of conservation

study can be represented as an easily igure 2, below) show the interaction of s the increase in genetic capture, as the onship follows an inverse exponential creases (for example, from 1 plant to 5 in genetic capture. Most importantly, n do not add significant conservation f diminishing marginal returns."

onship between collection size and eally no surprises here; more plants the fixed cost of bringing the plants conservation work costs include The slope of the line reflects the

Again, we use the number of ation." is the % genetic capture

c garden conservation. First, es above one individual. This ncreased further. Ultimately,

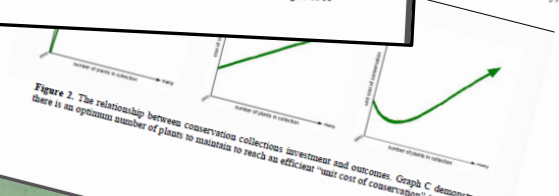


Figure 2. The relationship between conservation collections investment and outcomes. Graph C demonstrates that there is an optimum number of plants to maintain to reach an efficient "unit cost of conservation" (see text).

2006: First study with palms.
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Narrative of Proposal

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Developing a set of metrics for measuring conservation value of living collections, applying most advanced tools for gathering these metrics, and placing these data within an understood context of resource investment vs. conservation outcomes will satisfy this need. The tools, methods, and models developed through this project will allow living collections to efficiency models to the conservation operation. This will allow each dollar invested in conservation to have the greatest possible outcome.

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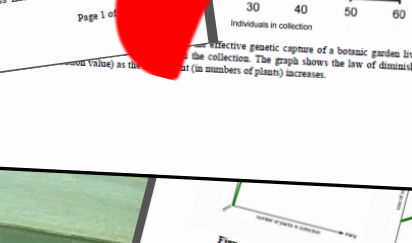


effective genetic capture of a botanic garden living collection is graphed the collection. The graph shows the law of diminishing marginal returns (on t (in numbers of plants) increases.

gs to a thorough review of spending on costs (in constant 2007 dollars) incurred to the collections and curate the data each year of variable size was calculated from these investment over the life of the collection the plants) and the efficacy of conservation

study can be represented as an easily igure 2, below) show the interaction of s the increase in genetic capture, as the nship follows an inverse exponential creases (for example, from 1 plant to 5 in genetic capture. Most importantly, n do not add significant conservation f diminishing marginal returns."

nship between collection size and eally no surprises here; more plants the fixed cost of bringing the plants s conservation work costs include The slope of the line reflects the

Again, we use the number of ation." is the % genetic capture

c garden conservation. First, es above one individual. This ncreased further. Ultimately,

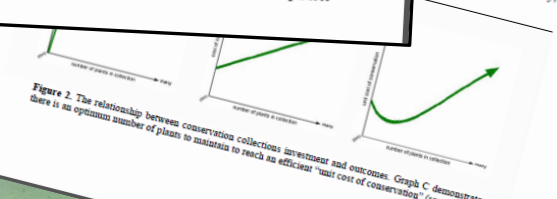


Figure 2. The relationship between conservation collections investment and outcomes. Graph C demonstrates that there is an optimum number of plants to maintain to reach an efficient "unit cost of conservation" (see text).

2006: First study with palms.
2010: First National Leadership Proposal.
2011: Second Proposal.

Narrative of Proposal

Assessment of need

Living collections are an essential element of robust conservation programs. Recently, the IMLS completed an important National Tour, centered on the nation's collections. A central piece of collections heritage is the nation's living collections, which were the subject of an in-depth IMLS forum (*Connecting to Collections*) held in San Diego in 2009. A key theme developed during this forum is the high conservation value represented in the USA's living collections. The salient crisis remains the accelerating, unprecedented loss of the world's living diversity, driven by the extinction of species and populations.

Resources are limited. In the time since the IMLS living collections forum – from early 2009 until now – the nation's collections have also seen an intense shortage of the staffing and resources needed to care for this national living collections heritage. The fiscal crisis has prompted an ongoing quest for the absolute greatest efficiencies in living collections management.

Therefore, a clear understanding of the relationship between investment and outcomes is necessary. Living collections are well established as an indispensable part of species conservation (Havens et al., 2004c). Investment in these living conservation collections is essential, but resources are scarce. While large efforts have been made in conserving biodiversity in living collections, the efficiency of this work has not been closely examined.

Developing a set of metrics for measuring conservation value of living collections, applying the most advanced tools for gathering these metrics, and placing these data within an easily understood context – resource investment vs. conservation outcomes – will satisfy this need for clear understanding. Tools, methods, and models developed through this proposed project will allow application of efficiency models to the conservation operation. A clear, easy-to-interpret model based on targeted research will allow all botanic garden users to perceive the important relationship between cost and benefit for conservation collections. **This model will allow each dollar invested in living collections to have the greatest possible conservation outcome.**

Audience needs and benefits

Briefly stated, botanic gardens need a clear yet robust model demonstrating the relationship between resource investment and conservation outcomes. This project will benefit all botanic gardens, as the models developed will enable realistic and pragmatic budgeting to be as effective as possible in achieving conservation goals.

Meeting conservation goals in an efficient manner is important for all living collections. For zoos and aquaria, there has been significant research that can be directly applied, mostly in the area of minimum viable population studies (DeSalle and Amato, 2004). Population management plans for living animal collections have had a moderate level of development. The project proposed here will produce a broadly applicable model to enable exploration of the relationship between investment and conservation outcomes for plant collections.

As with zoos, botanic gardens work to cultivate rare species for the purpose of *ex situ* conservation. Strategies for conserving living plants vary among and within garden collections (Wyse Jackson & Sutherland, 2000; CBD, 2002; Havens et al., 2004a, 2004b, 2006; Farnsworth et al., 2006). Much progress has been made among gardens in moving from an eclectic or synoptic collections structure based on few individuals to a population-based structure. As understanding of the importance of genetic diversity has increased, more botanic gardens have sought to maximize their collections' genetic diversity by preserving multiple individuals from several populations, as 'seed orchards,' 'seed colonies,' or 'field genebanks' (Valois, 1994; Vaxevanidou et al., 2006).

...this project will have broad application. This project will be widely disseminated, for a robust national impact. By clearly highlighting the relationship among genetic diversity, collection size and resource investment for living plant collections, this model will increase our collective national ability to advance conservation goals relative to capacity. **Any garden with recent or long-standing programs in living conservation collections will more efficiently reach their goals through the models developed here.**

A diverse, nationwide group of botanic gardens anticipate direct benefit from this project. Please see Supporting Document 1 for comments from the botanic garden community.

...Leverich, 2004) and direct

...erpreted model to aid in ...ctions and investment; **2)** ...for the Global Strategy for ...titutions need carry out *ex* ...d international meetings, ...Garden Association, the ...CN Specialist Groups; **4)** ...of this innovative work, ...the general public about ...09; Griffith and Husby,

...ervation collections to ...rvation outcome. Clear ...f the project.

...ections have limited ... maximize *ex situ*

...rvation collections ...eta internationally ...ately 500 gardens ...the APGA group, ... Plant Collections ...of around 6 new

...27 U.S. gardens ...f their ongoing ...botanic gardens to ...mation on how they can specifically

...ds and a preliminary model for ...icient application of resources ...genetics of an extensive living ...llecting event (Namoff et al., ...metics of the collection to the ...enetic data, we modeled the ...rting Document 2).

...ersity; 2) as collection size ...which increased investment ...e the conservation value of ...urithmic function: i.e., the ...h review of spending on ...o obtain the plants in 1995 ...ost model for maintaining ...nship between monetary ...caring for the plants) and ...interrelationship of these ...e figure 2 in Supporting ...hree variables – number

...; is readily ...case studies ...more robust

...our model ...servatories ...palm heart ...lity, rattan

...species proposed for this model system ...family comparisons, and belong to areas of established strength for the

...pattern is called the "law of diminishing marginal returns." 2) ...in the collection do not add significant ...maintain, more plants equal higher costs. The fixed costs of bringing the plants to the garden (fieldwork and ...collection size and cost is straightforward. Because each plant costs the same to

...ulture operation. Using ...ation we use 'number ...hat collection divided

...vation. First, there is ...his is followed by a ...t cost more or less ...um efficiency for ...llection size where ...e cost of the initial ...e, you may as well

...*situ* conservation ...onsistent with our ...estment occurs at ...itchard, 2009; for ...botanic gardens.

...inary case study ...straightforward ...the boundaries ...is more or less

...ystems among ... species, The ...2003), so any

...ation decline in the Florida Keys, ...ed to a single population of 47 ...f plants by 2003 (Maschinski and ...lirchild Tropical Botanic Garden ...living collections may conserve ...ed protocols to isolate and study ...have been successfully utilized ...*unii* (Namoff et al., 2011).

...n native to western Belize. Two ...smaller populations of up to 15 ...les (Calonje et al., 2009). Seed ...holds a living collection of 118 ...ew a very strongly represented ...ographic population structure. ...ge of this species. Population ...w et al., in press).

...nsight into improving living ...living plant collections. Does ...*micronesica* allow us to avoid losses that occurred in the 20th Century with *P. sargentii* in South Florida? Can

...ntial characteristics which make them ...ed, **2)** population sampling fieldwork ...nd **4)** complete financial records over ...the following comparisons: flowering ...on vs. critically endangered plants. ...stances (described below) which can

...010; Namoff et al., 2010b; Griffith et ...serve a healthy, insular population of ...the expanded model.

...slands, this species is a dioecious ...ere population reduction due to an ...ate collecting events. 27 plants are ...targeted *Pseudophoenix sargentii* population ...after the native population had been ...collected in 2007 for genetic studies ...ons undergoing a current crisis and ...tions over time. Recent studies of ...ce of using modern genetic tools to ...Settle et al. 2007, 2008). Our team ...s based on microsatellites (Cibrian

...morphic loci, genetic differentiation ...average number of alleles per locus, ...al. (2010b, 2011), Jost (2008), and ...

...amount of allele capture from the ...resampled with replacement, to ...ples". These resamples will be ...other; i.e. accessions), or pooled ...ccessions and from 1 to the full ...e random samples will be made ...use, 2006).

...e number of individual and ...be modeled as a function of ...and logistic (Namoff et al., ...increasing accessions will be ...with different numbers of ...e between higher and lower ...interval for allele capture ...Institute, Inc., 2009).

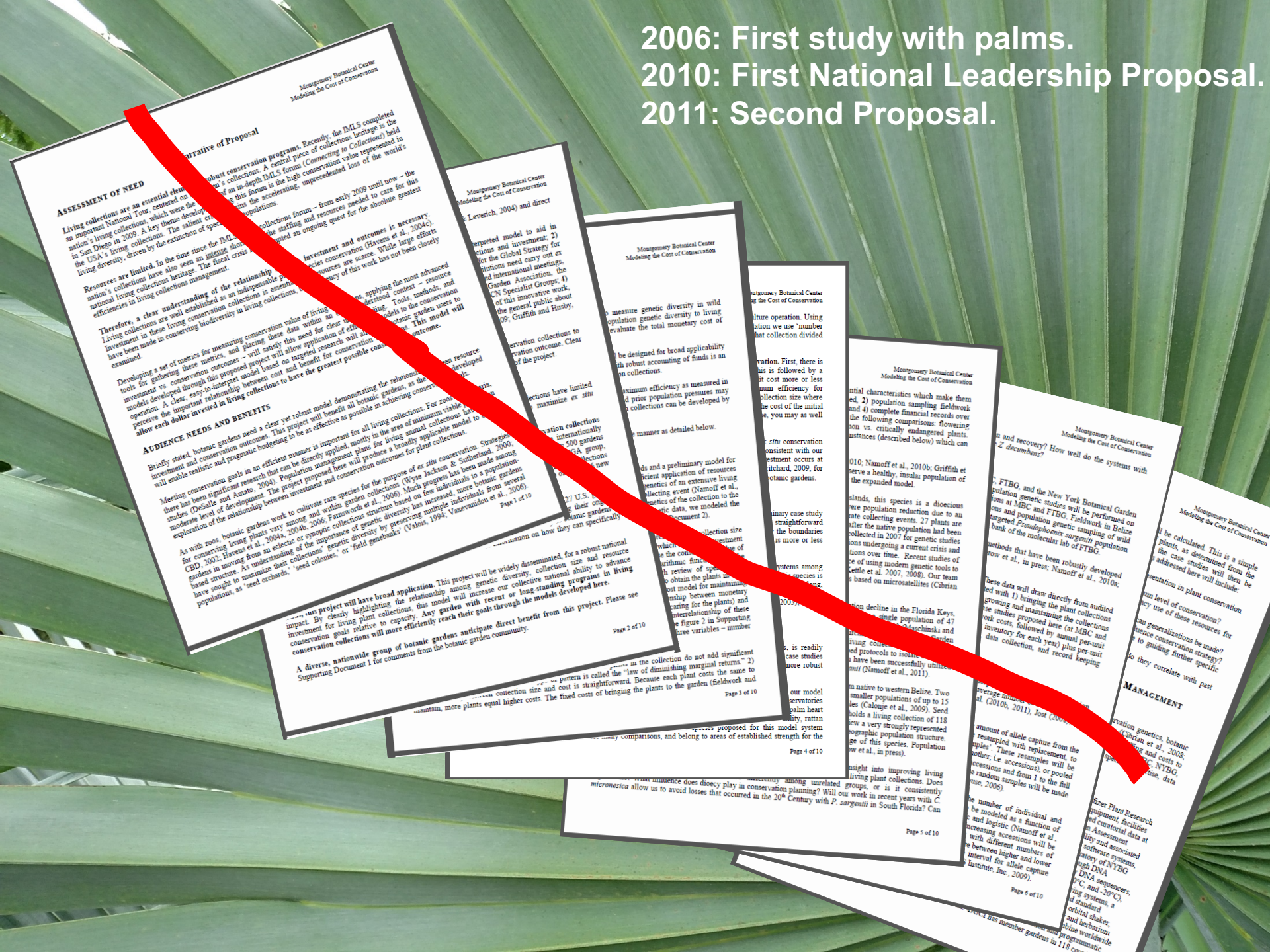
...m level of conservation? ...cy use of these resources for ...an generalizations be made? ...ence conservation strategy? ...to guiding further specific ...do they correlate with past

Management

...rvation genetics, botanic ...Cibrian et al. 2008. ...1) staffing and costs to ...e results. MBC, NYBG, ...specific expertise, data

...izer Plant Research ...quipment, facilities ...ed curatorial data at ...n Assessment ...lity and associated ...software systems, ...atory of NYBG ...ugh DNA ...DNA sequencers, ...°C, and -20°C), ...ng systems, a ...d standard ...orbital shaker, ... and herbarium ...ibine worldwide ...programmatic ...BCC has member gardens in 118 co...

2006: First study with palms.
2010: First National Leadership Proposal.
2011: Second Proposal.



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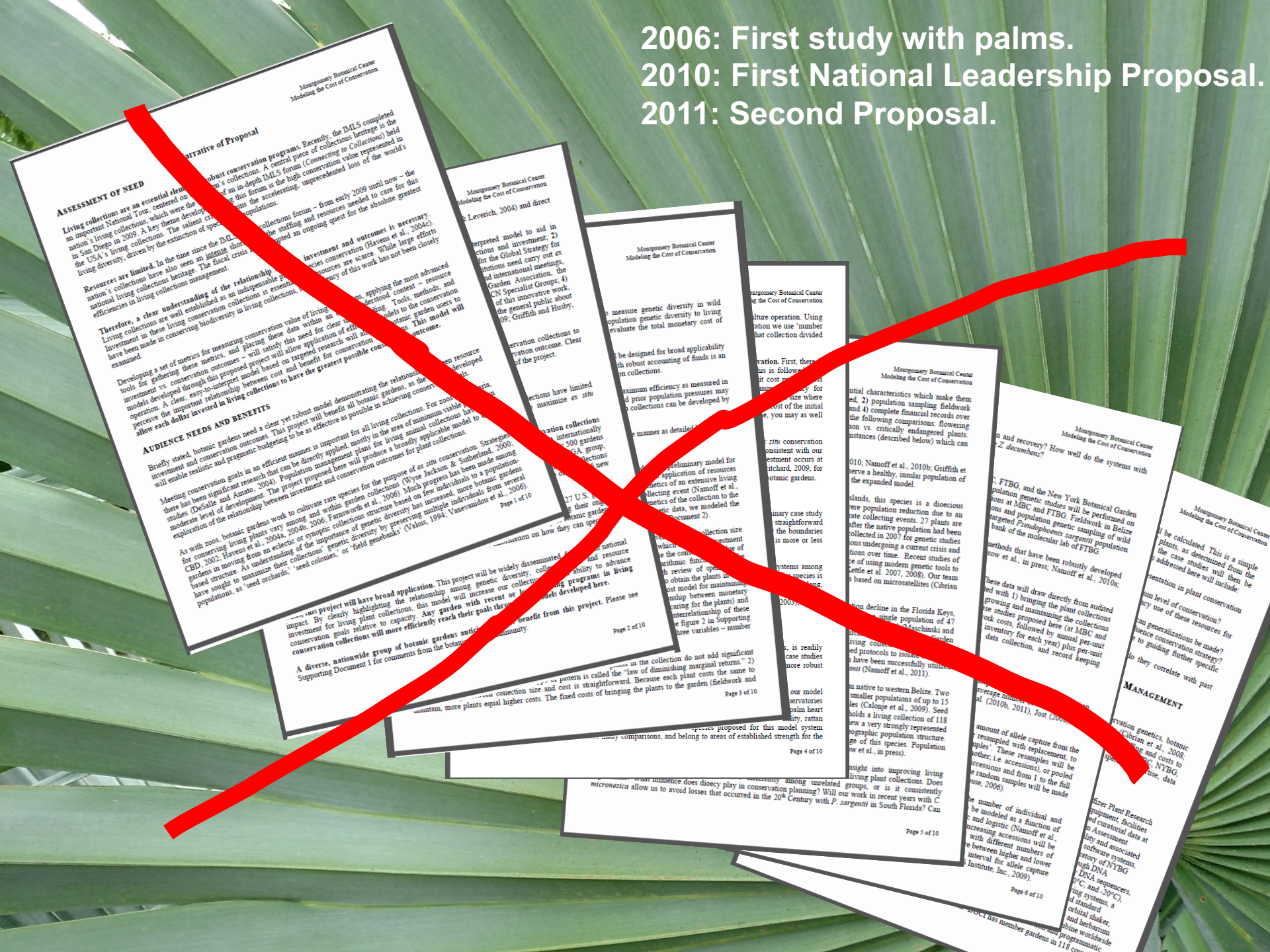

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-- Rethinking and Listening --

IMLS Connecting To Collections Conference, 2009

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-- Rethinking and Listening –

2011: Museums For America Proposal

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1. What we've done.
2. How we got there.
3. Lessons about writing.
4. Lessons about leading.

1. What we've done.
2. How we got there. → Listening and adapting
3. Lessons about writing.
4. Lessons about leading.


1. What we've done.
2. How we got there.
3. Lessons about writing.
4. Lessons about leading.


A. Write for the community.


A. Write for the community ?

A. Write for the community.

A. Write for the community.

A. Write for the community.

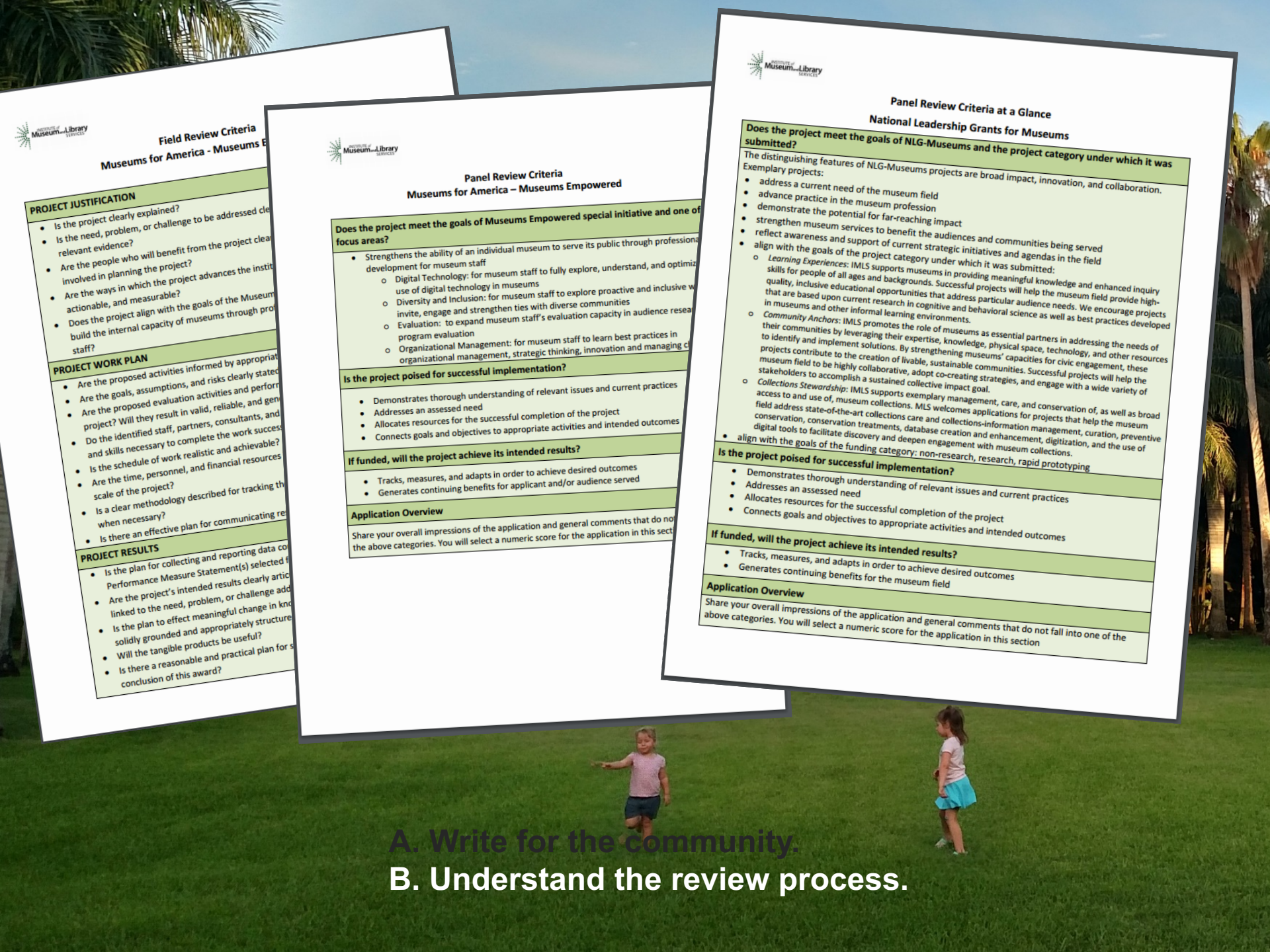

Broad, Accessible
Precise, Technical
A. Write for the community.

A. Write for the community.

A. Write for the community.

A. Write for the community.


A. Write for the community.
B. Understand the review process.

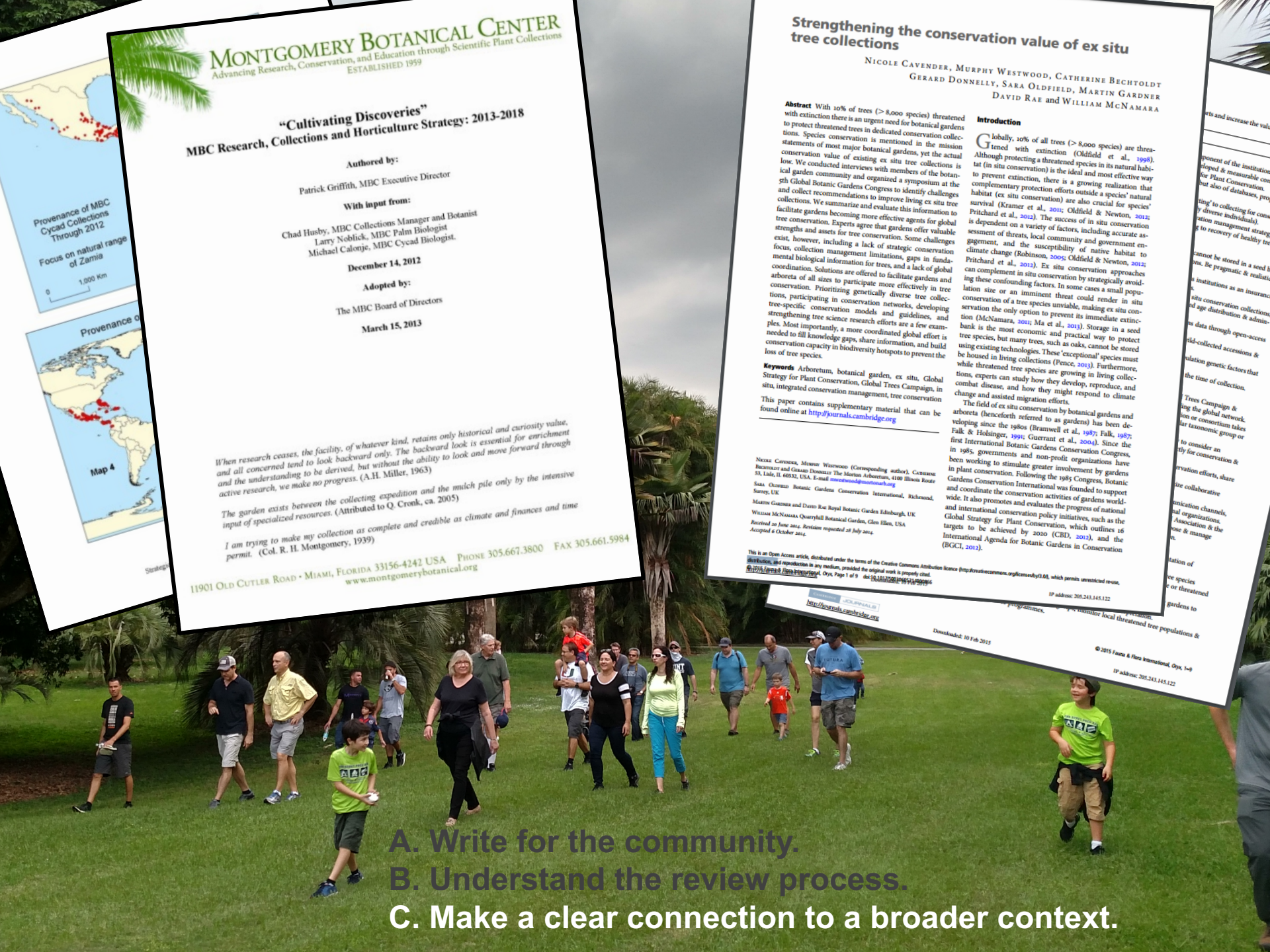


A. Write for the community.

B. Understand the review process.


A. Write for the community.
B. Understand the review process.
C. Make a clear connection to a broader context.


Provenance of MBC Cycad Collections Through 2012
Focus on natural range of Zamia
0
1,000 Km
Provenance o
Map 4
MONTGOMERY BOTANICAL CENTER
Advancing Research, Conservation, and Education through Scientific Plant Collections
ESTABLISHED 1959
"Cultivating Discoveries"
MBC Research, Collections and Horticulture Strategy: 2013-2018
Authored by:
Patrick Griffith, MBC Executive Director
With input from:
Chad Husby, MBC Collections Manager and Botanist
Larry Noblick, MBC Palm Biologist
Michael Calonje, MBC Cycad Biologist.
December 14, 2012
Adopted by:
The MBC Board of Directors
March 15, 2013
When research ceases, the facility, of whatever kind, retains only historical and curiosity value, and all concerned tend to look backward only. The backward look is essential for enrichment and the understanding to be derived, but without the ability to look and move forward through active research, we make no progress. (A.H. Miller, 1963)
The garden exists between the collecting expedition and the mulch pile only by the intensive input of specialized resources. (Attributed to Q. Cronk, ca. 2005)
I am trying to make my collection as complete and credible as climate and finances and time permit. (Col. R. H. Montgomery, 1939)
11901 Old Cutler Road • Miami, Florida 33156-4242 USA Phone 305.667.3800 Fax 305.661.5984
www.montgomerybotanical.org
A. Write for the community.
B. Understand the review process.
C. Make a clear connection to a broader context.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Strengthening the conservation value of ex situ tree collections
Nicole Cavender, Murphy Westwood, Catherine Bechtoldt
Gerard Donnelly, Sara Oldfield, Martin Gardner
David Rae and William McNamara
Abstract With 10% of trees (> 8,000 species) threatened with extinction there is an urgent need for botanical gardens to protect threatened trees in dedicated conservation collections. Species conservation is mentioned in the mission statements of most major botanical gardens, yet the actual conservation value of existing ex situ tree collections is low. We conducted interviews with members of the botanical garden community and organized a symposium at the 5th Global Botanic Gardens Congress to identify challenges and collect recommendations to improve living ex situ tree collections. We summarize and evaluate this information to facilitate gardens becoming more effective agents for global tree conservation. Experts agree that gardens offer valuable strengths and assets for tree conservation. Some challenges exist, however, including a lack of strategic conservation focus, collection management limitations, gaps in fundamental biological information for trees, and a lack of global coordination. Solutions are offered to facilitate gardens and arboreta of all sizes to participate more effectively in tree conservation. Prioritizing genetically diverse tree collections, participating in conservation networks, developing tree-specific conservation models and guidelines, and strengthening tree science research efforts are a few examples. Most importantly, a more coordinated global effort is needed to fill knowledge gaps, share information, and build conservation capacity in biodiversity hotspots to prevent the loss of tree species.
Keywords Arboretum, botanical garden, ex situ, Global Strategy for Plant Conservation, Global Trees Campaign, in situ, integrated conservation management, tree conservation
This paper contains supplementary material that can be found online at http://journals.cambridge.org
Introduction
Globally, 10% of all trees (> 8,000 species) are threatened with extinction (Oldfield et al., 1998). Although protecting a threatened species in its natural habitat (in situ conservation) is the ideal and most effective way to prevent extinction, there is a growing realization that complementary protection efforts outside a species' natural habitat (ex situ conservation) are also crucial for species' survival (Kramer et al., 2011; Oldfield & Newton, 2012; Pritchard et al., 2012). The success of in situ conservation is dependent on a variety of factors, including accurate assessment of threats, local community and government engagement, and the susceptibility of native habitat to climate change (Robinson, 2005; Oldfield & Newton, 2012; Pritchard et al., 2012). Ex situ conservation approaches can complement in situ conservation by strategically avoiding these confounding factors. In some cases a small population size or an imminent threat could render in situ conservation of a tree species unviable, making ex situ conservation the only option to prevent its immediate extinction (McNamara, 2011; Ma et al., 2013). Storage in a seed bank is the most economic and practical way to protect tree species, but many trees, such as oaks, cannot be stored using existing technologies. These 'exceptional' species must be housed in living collections (Pence, 2013). Furthermore, while threatened tree species are growing in living collections, experts can study how they develop, reproduce, and combat disease, and how they might respond to climate change and assisted migration efforts.
The field of ex situ conservation by botanical gardens and arboreta (henceforth referred to as gardens) has been developing since the 1980s (Bramwell et al., 1987; Falk, 1987; Falk & Holsinger, 1991; Guerrant et al., 2004). Since the first International Botanic Gardens Conservation Congress, in 1985, governments and non-profit organizations have been working to stimulate greater involvement by gardens in plant conservation. Following the 1985 Congress, Botanic Gardens Conservation International was founded to support and coordinate the conservation activities of gardens worldwide. It also promotes and evaluates the progress of national and international conservation policy initiatives, such as the Global Strategy for Plant Conservation, which outlines 16 targets to be achieved by 2020 (CBD, 2012), and the International Agenda for Botanic Gardens in Conservation (BGCI, 2012).
Nicole Cavender, Murphy Westwood (Corresponding author), Catherine Bechtoldt and Gerard Donnelly: The Morton Arboretum, 4100 Illinois Route 53, Lisle, IL 60532, USA. E-mail mwestwood@mortonarb.org
Sara Oldfield: Botanic Gardens Conservation International, Richmond, Surrey, UK
Martin Gardner and David Rae: Royal Botanic Garden Edinburgh, UK
William McNamara: Quarryhill Botanical Garden, Glen Ellen, USA
Received 20 June 2014. Revision requested 28 July 2014.
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A. Write for the community.
B. Understand the review process.
C. Make a clear connection to a broader context.


1. What we've done.
2. How we got there.
3. Lessons about writing.
4. Lessons about leading.


1. What we've done.
2. How we got there.
3. Lessons about writing.
Know your audience and your goal.
4. Lessons about leading.

1. What we've done.
2. How we got there.
3. Lessons about writing.
4. **Lessons about leading.**


i. Build a team, then build a proposal.

2016-2019: National Leadership Grant

i. Build a team, then build a proposal.

2016-2019: National Leadership Grant

2016: grant awarded, work began.

i. Build a team, then build a proposal.

2016-2019: National Leadership Grant

2015: proposal written.

2016: grant awarded, work began.

i. Build a team, then build a proposal.

2014: proposal planned.
2015: proposal written.
2016: grant awarded, work began.

i. Build a team, then build a proposal.

2016-2019: National Leadership Grant

2013: core team built.

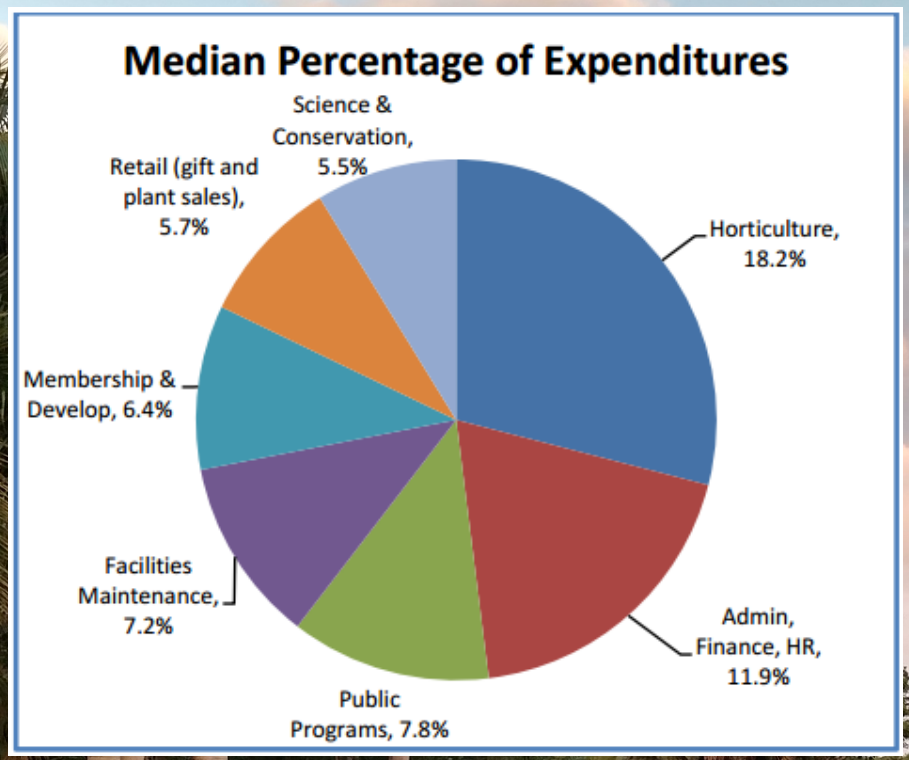
2014: proposal planned.

2015: proposal written.

2016: grant awarded, work began.

i. Build a team, then build a proposal.

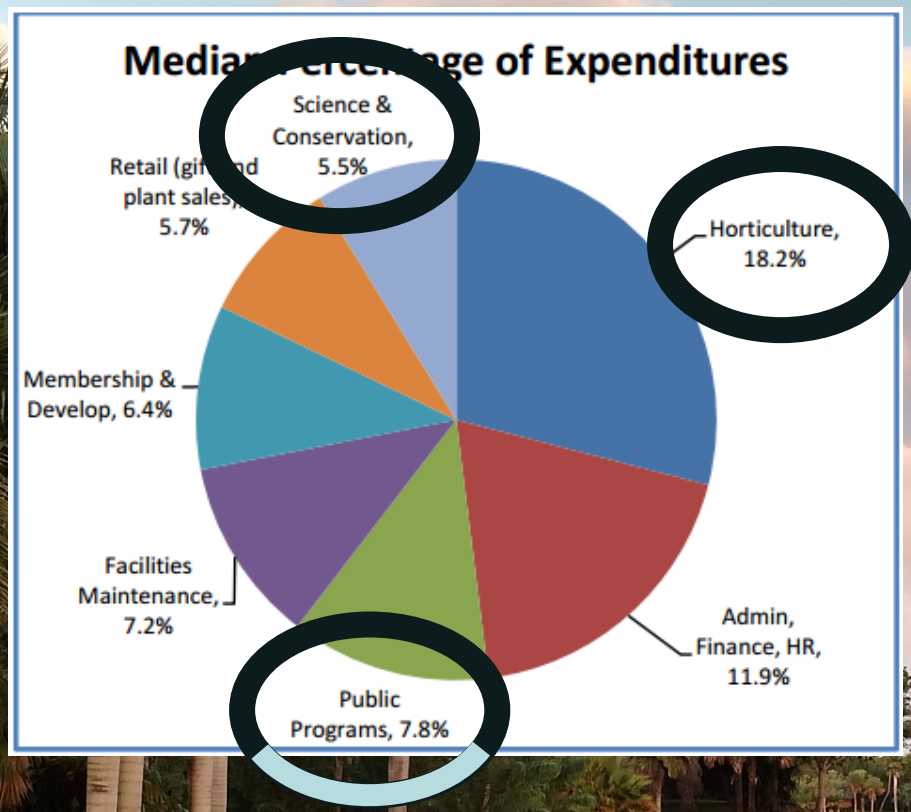

i. Build a team, then build a proposal.
ii. Be aware of organizational culture.



i. Build a team, then build a proposal.

ii. Be aware of organizational culture.

Your proposal is from here.



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ii. Be aware of organizational culture.

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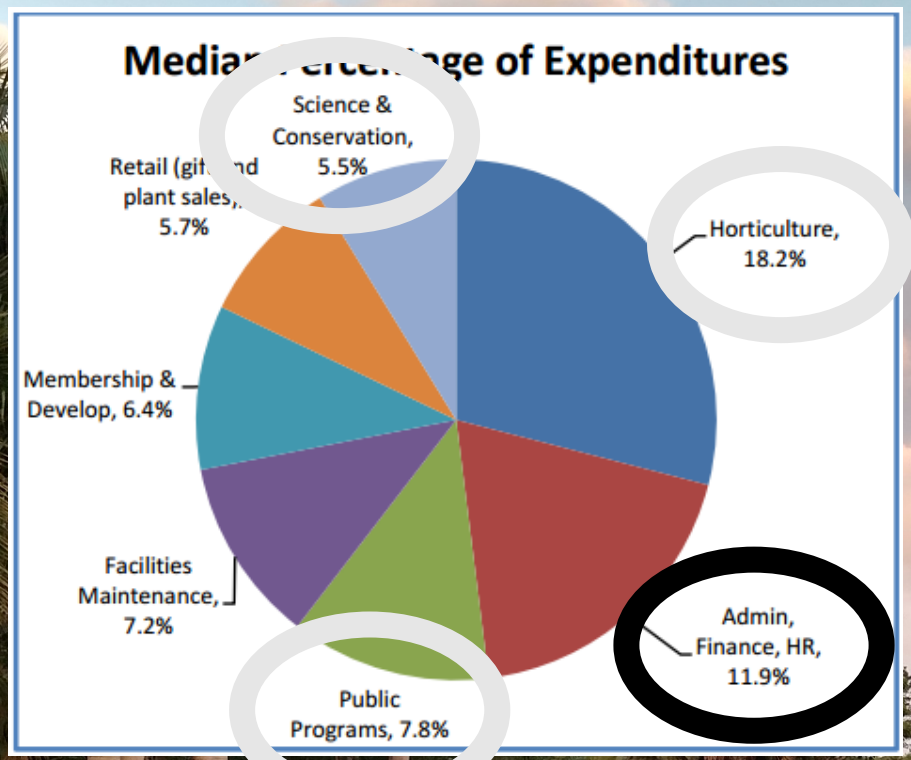
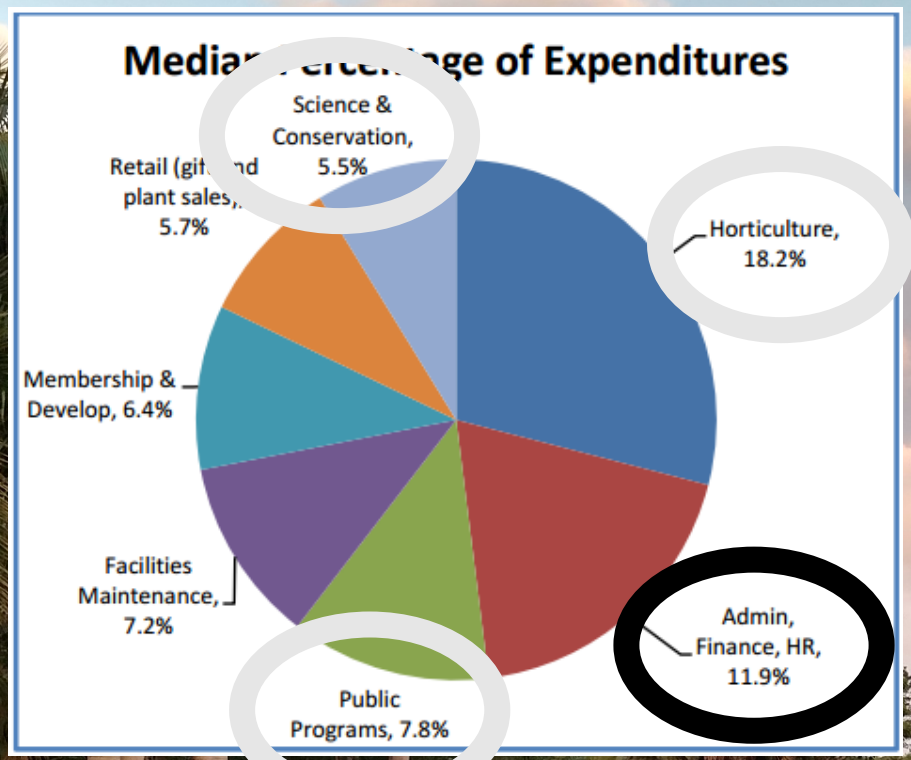


Money flows through here.

i. Build a team, then build a proposal.

ii. Be aware of organizational culture.

Your proposal is from here.



Money flows through here.
These people will not read your proposal.

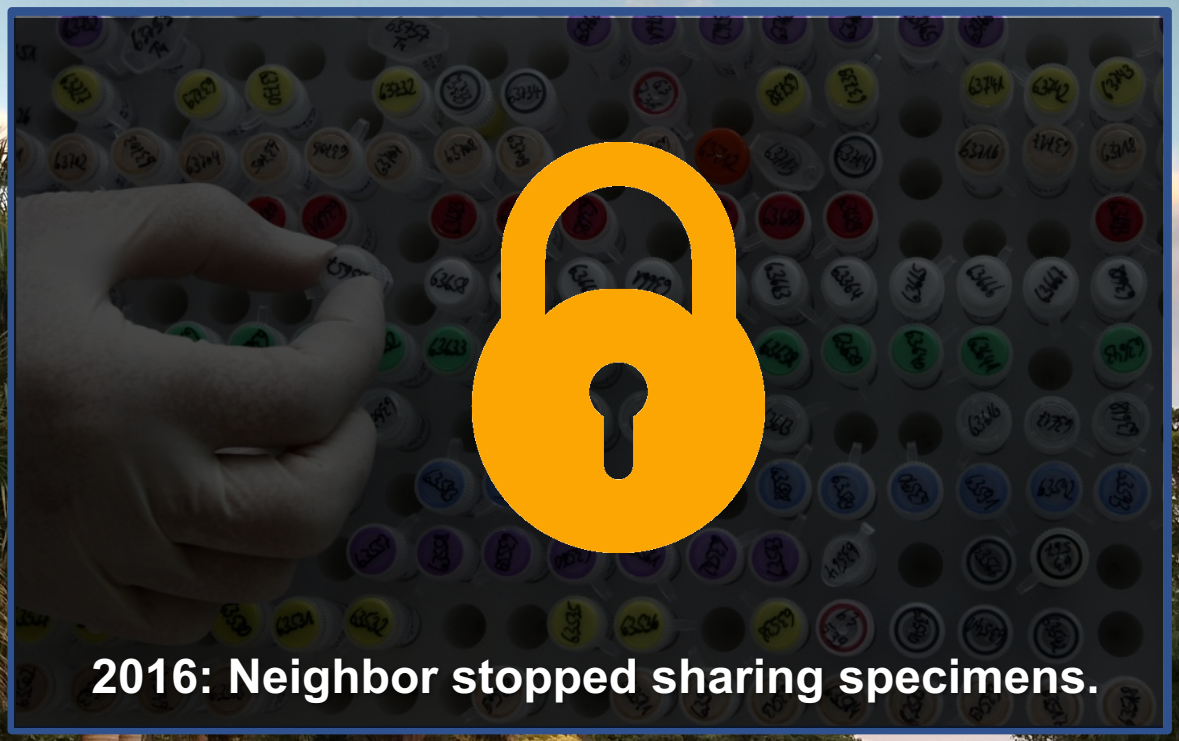
i. Build a team, then build a proposal.
ii. Be aware of organizational culture.


i. Build a team, then build a proposal.
ii. Be aware of organizational culture.
iii. Adapt to circumstances.

2015: Proposal required 90 DNA samples from neighbor.

i. Build a team, then build a proposal.
ii. Be aware of organizational culture.
iii. Adapt to circumstances.

2015: Proposal required 90 DNA samples from neighbor.



2016: Neighbor stopped sharing specimens.

i. Build a team, then build a proposal.
ii. Be aware of organizational culture.
iii. Adapt to circumstances.


2017: Cleared calendar
for new fieldwork.


2017: Cleared calendar for new fieldwork.
Funded by donors


> 300 new DNA samples


> 300 new DNA samples
Still on schedule
Year 1
Schedule of Completion
Montgomery Botanical Center
Safeguarding our Plant Collections
Year 1
2016
2017
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Task
1. Hiring Project Staff (Technicians, Student)
2. Field collecting of two species.
3. Organizational Meeting 1: MA
4. Data Acquisition
5. Living collections and population analysis
6. Dissemination of Results via Conferences
7. Meeting 2: Metapopulation management workshop
8. Comparative hypothesis testing
9. Dissemination of Results via Peer Reviewed Journals and Publications
10. Organizational Meeting 3: MA
11. Preparation and distribution of Guideline publication
12. Evaluation of project.
13. Communication of progress and results via Internet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2. How we got there.
3. Lessons about writing.
4. **Lessons about leading.**

1. What we've done.
2. How we got there.
3. Lessons about writing.
4. **Lessons about leading.** →

"Lie low and dig in deep."
WILSON POPENOE, 1921


One man’s experience with the IMLS.

First, listen;

One man's experience with the IMLS.

First, listen; then, write.

One man's experience with the IMLS.

First, listen; then, write. Finally, WORK.

One man's experience with the IMLS.

First, listen; then, write. Finally, WORK.

One man's experience with the IMLS.

Thank You

INSTITUTE of Museum and Library SERVICES

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