December 13, 2007

Dr. Patrick Griffith
Montgomery Botanical Center
11901 Old Cutler Road
Miami, FL 33156

Dear Dr. Griffith,

Congratulations! The APGA's North American Plant Collections Consortium is pleased to inform you that both the Montgomery Botanical Center's Cycad Collection and Palm Collection have been granted NAPCC Member Status as Collections of National Significance. NAPCC certificates and a copy of each NAPCC Evaluation Checklist completed by Site Reviewer Dena Rae Garvue are included with this letter.

Your organization stands among a prestigious group of gardens and arboreta that have committed themselves to the conservation and care of specific plant collections curated at the highest professional level. Participation in the Consortium means that you are willing to make your collections available for increased distribution and research, and that you promote public awareness of conservation issues.

We thank you, your governing body and your staff for the considerable amount of time and effort you have taken to prepare these two applications, and participate in the evaluation process. Your enthusiasm for and commitment to the Consortium's goals is much appreciated and will have long lasting benefits for the preservation of living collections.

Finally, we are preparing publicity materials to promote the NAPCC collections holders. Would you please supply a CD with five digital images of each collection, both landscape and detail shots, for use in these efforts? High resolution (300+dpi) images in .tif or .jpg format would be most useful. We would also like to feature your NAPCC Palm and Cycad Collections in a future issue of our quarterly publication, *The Public Garden*. Our editor will contact you with more details in the New Year.

Sincerely,

Pamela Allenstein
NAPCC Coordinator

encl: two NAPCC Evaluation Checklists
NAPCC certificates

cc: Dena Rae Garvue, NAPCC Site Reviewer

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North American Plant Collections Consortium
2007 Site Evaluation Report for Single Institution Application

Applicant Information

Name of Applying Institution: Montgomery Botanical Center

Name of Proposed NAPCC collection: Cycad Collection

Curator of proposed NAPCC collection: Michael A. Calonje, M.S., Cycad Biologist

NAPCC Site Reviewer

NAPCC Site Reviewer: Dena Rae Garvue

Institutional Affiliation: Bernheim Arboretum and Research Forest

Job Title: Horticulture Director

Telephone number of Reviewer: 502-955-8512 x 241

FAX number of Reviewer: 502-955-4039

E-Mail address of Reviewer: dgarvue@bernheim.org

Date of site visit: November 8 – 10, 2007

Proposed Collection Information

Is the primary focus of the collection as proposed in the application nationally significant? Is it practical and achievable by the applicant? Please describe.
The Montgomery Botanical Center (MBC) Cycad Collection is a resource of national and world significance. Since 1932 MBC has built a comprehensive, population based collection of well-documented cycads collected from the wild. MBC's documented plant collections are grown for the purposes of scientific research, conservation, education and display. As of 2006, there are 1,173 cycad accessions, with 10 genera and 222 taxa represented, and 2,938 cycad plants in the ground. MBC's goal is to have reproducing collections of all known cycads and hold and grow as many of the *ca.* 300 cycad species as possible from wild sources represented by population samples. Cycads are planted according to a detailed landscape design that is updated annually and the Master Site Plan that was developed for the property in 1992.

Patrick Griffith, Executive Director, and Chad Husby, Collections Manager/Botanist, gave me an overview of the institution's mission and primary focus of the Cycad Collection. MBC's primary focus is to build and maintain an *ex situ* conservation cycad collection focused on genetic diversity. In accordance with this mission and its means, MBC directs its resources towards *ex situ* preservation of scientifically valuable cycad populations. MBC continues to demonstrate that this goal is practical and achievable. The institution has a 75 year tradition of curating cycad collections since Colonel Robert H. Montgomery established a 120-acre estate in 1932 to build his personal tropical plant collection. Records of MBC's cycad accessions go back to 1932, and include detailed data on provenance, habitat, collector, growth and development, and horticultural care. The taxonomic and biogeographical scope of the current living Cycad Collection demonstrates the ability of MBC, staff and site to support a comprehensive and exceptional cycad collection.

What internal documentation is evident that the proposed collection fits into the overall mission of the applicant?
The Montgomery Botanical Center's Plant Collection Policy, website, and newsletters clearly articulate and outline the goals, purpose and mission of MBC's collections. The Plant Collection Policy was approved and adopted by the MBC Board of Directors in 2005. MBC's mission is to develop scientifically valuable collections of tropical plants, particularly palms and cycads, to advance and promote conservation, scientific investigation, educational opportunities and horticultural knowledge of tropical plants, and to exemplify excellent botanical garden design in a way that brings recognition and respect to the "Montgomery" name and enhances the field of tropical plant science.

Do the current taxonomic groupings and number of both live taxa and accessions within the existing collection appear to be accurate? Please describe.
Yes. The Montgomery Botanical Center's Cycad Collection is led by Michael A. Calonje, M.S., an expert in *ex situ* cycad conservation. Michael has extensive cycad collecting experience internationally and is supported in the collecting and scientific activities of the Cycad Program by a well qualified botanical, horticultural, and plant records staff. Michael obtains extensive and detailed field data for each collection including herbarium vouchers and photographs, and uses the scientific literature, personal field experience and expertise, and comparisons with professionally identified herbarium vouchers to evaluate the accuracy of MBC's collections. MBC's general cycad taxonomy reference is Hill, Stevenson and Osborne, The World List of Cycads. In: Walters, T. & R. Osborne (Eds.) 2004, Cycad Classification: Concepts and Recommendations, CABI Publishing, Cambridge, MA. Local and world-renown cycad experts and visiting cycad scientists annotate MBC's collections and complete a

MBC Cycad Annotation / Verification Form. The Form is routed to the Cycad Biologist and then to the Collections Database Supervisor, Collections Supervisor and Collections Specialist. All annotations are recorded and archived in a detailed plant records database. Arantza Strader, Database Supervisor, administers the MBC collections database. She demonstrated how plant records data are managed, retrieved and made available to visiting researchers. Inventory records appear accurate, complete and up-to-date for the Cycad Collection.

Is the collection significant as it currently exists?
MBC's Cycad Collection is of national significance as it currently exists. Habitat destruction poses serious threats to cycad biodiversity throughout the world. With the diversity of cycad species in the wild vanishing, MBC's collections with associated detailed scientific data play an important role in regional, national and international conservation strategies. MBC's Cycad Collection includes 1,173 accessions, with 10 genera and 222 taxa represented, and 2,938 cycad plants in the ground. The Cycad Collection includes cycads from 46 countries. MBC is also a registered U.S. Fish & Wildlife Service Plant Rescue Center.

To protect and perpetuate the genetic diversity of its collections, MBC actively builds its populations of cycads by conducting three to five research and conservation expeditions each year to tropical regions of the world to obtain targeted propagules for the Cycad Collection. Collections are primarily augmented through international collaborations. Staff work in partnership with U.S. research teams and overseas partners, generally with research botanists, professors, and botanical gardens in close proximity to the areas being collected. Sixty two MBC-sponsored collecting expeditions have been successfully completed since 1992 and information about selected expeditions is posted on MBC's website. Provenance data of individual accessions extend from 41°N through 34°S, with good representation throughout this latitudinal range. MBC uses stringent protocols for collecting in the wild, including science-based genetic sampling guidelines. Collecting protocols seek to maximize capture of populational genetic diversity of cycads by collecting sufficient seed to ultimately plant at least three plants from at least five mother plants into the permanent grounds collection.

How does it relate to similar collections at other institutions within North America? Please describe.
Significant collections of cycads can be found at Fairchild Tropical Botanic Garden, Huntington Botanical Gardens, and Ganna Walska Lotusland. MBC's Cycad Collection complements these collections significantly. The collections cited above are primarily display or historical collections. MBC made the long-term decision to develop scientifically useful, population-based cycad collections in 1994.

Do the growing conditions, climate, existing collection, staff expertise, herbarium, library, etc., make the institution an appropriate holder of a NAPCC collection for this plant group? Please describe.
MBC is an appropriate holder of a NAPCC Cycad Collection for many reasons. MBC's Cycad Collection is of national significance as it currently exists. A wide biogeographic range of cycad populations are cultivated and individual cycad are healthy on the MBC site. Historic records indicate the property was specifically selected for its optimum growing conditions, climate, soils, and variety of natural habitats in 1932 by Colonel Montgomery to build his personal tropical collection, particularly palms and cycads. Three similar, long-standing tropical plant collections (Fairchild Tropical Botanic Garden, USDA Chapman Field, The Kampong of the National Tropical Botanic Garden) in the area further demonstrate the suitability of the site for a cycad collection.

Twelve MBC staff members work together in three closely interrelated departments (Collections Development, Horticulture & Facilities, and Administration) in support of the Cycad Collection. This team is led by Michael A. Calonje, M.S., an expert in *ex situ* cycad conservation, and includes two Ph.D. scientists and three M.S. (including one Ph.D. candidate), two B.S. and two B.A. staff members who actively partner with universities throughout the world and area colleges. Four staff members, with over 30 years of combined horticultural experience with MBC's Cycad Collection, have responsibility for the day-to-day horticultural care of the Collection.

Plants in the collections receive the following routine care: appropriate site selection for outplanting, label maintenance, staking, bracing or cabling if necessary, irrigation, fertilization (3x per year: February, May/June, and November/December), pruning, provision of a weed-free environment, control of plant disorders, pests and diseases (i.e., management of the cycad aulacaspis scale), and mulching. Hurricane damage assessment and response protocols for MBC's Plant Collections have been developed and are revised periodically. Plants are mapped, inventoried annually, and monitored regularly. Staff maintain detailed records of cultural treatments and results.

Herbarium vouchers are housed at the Center for Tropical Plant Conservation, a research facility that includes a herbarium, research laboratories, a library, and plant nursery facilities operated by Fairchild Tropical Botanic Garden (FTBG) on eight acres leased by the MBC to FTBG. The herbarium is the largest in the region with more than 165,000 preserved plant specimens. It is open only by appointment. The collections focus on the floras of Florida, the Bahamas and Caribbean basin; cultivated plants of tropical Florida, and worldwide palms and cycads. Associated with the herbarium is a program to display electronic images of herbarium specimens, the Virtual Herbarium, a resource that makes the herbarium specimens accessible via the World Wide Web.

The library is one of the finest tropical botanic collections in South Florida, including both current research works and historical works. The library currently encompasses several major collections including a research library that holds about 14,000 non-circulating volumes focusing on tropical botany, taxonomy, and conservation. It is housed in the research building and open only by appointment.

The Montgomery Archive documents the history of MBC since its founding in 1959 as a as a private, non-profit, operating institution as well as the lives of Robert and Nell Montgomery in Florida.

Collection Records

Are plant records (ledger, card file, computerized list, field maps, etc.) accurate, complete, and up-to-date for the collection? Please describe.
MBC's plant records database system is a vital component of the Cycad Collection. During my site visit I reviewed 16 different forms used by staff to keep MBC's plant records up-to-date. An automated, complete backup of the computerized plant records database is completed daily. Quarterly tape backups are made and stored securely off-site in a local bank vault.

A team of three MBC Collections Development staff members carry out plant records, data management, mapping, accessioning, and inventory work related to the Cycad Collection. The Collections Development staff, Seedbank Coordinator, and Horticulturist work together to gather data. Cycad collecting expeditions are primarily the responsibility of MBC's Cycad Biologist. He complies with all relevant local, national, and international laws and regulations with respect to the collection

and movement of plant materials. Herbarium vouchers are produced for all germplasm field collected by MBC staff, and staff complete a Wild Collection Data Form. Information about propagules collected in the wild includes the base passport data and precise locality date, a description of the habitat, natural growing conditions (e.g., soil and light), collection permits, herbarium vouchers, and photographs. Duplicate herbarium vouchers are deposited in one or more herbaria within the country of origin and the U.S.

Living plant material acquired by MBC is accessioned upon its arrival at MBC. The Nursery Curator frequently inputs data from the day propagules enter the nursery until the juvenile plants are incorporated into the ground collection. Each outplanted accession is labeled and laser survey equipment is used to precisely map each accession. From nursery to ground collection, detailed records are maintained using BG-Base™ and BG-Map™ software. Information about specific species as well as their precise location on the property can be retrieved readily. Map printouts are customized according to need. The Collections Development staff, Seedbank Coordinator, and Horticulturist work together to collect phenological data. MBC has an ongoing imaging program in which photographs are taken on a regular basis to document cycad growth and development. Details on the life history of each accession are recorded regularly and stored digitally. The pertinent growth and development stages of each accession, the processes involved in pollen and seed production and harvesting, as well as plant health, care and death are recorded. Scientific research, horticultural experimentation, plant removals and relocation, natural disasters, or any other event or activity involving the plant is recorded and archived.

Are field accession labels (or seed/pollen/tissue culture labels) present and complete? Please describe.
Attractive and well maintained labels are present on individual cycads in the Cycad Collection. Each cycad receives a permanent label when it is planted in the ground collection, and the condition of these labels is monitored regularly. The labels are engraved and are made of durable, UV stable plastic. Labels for young and/or small cycads are mounted on aluminum wire stakes. Labels for larger cycads are strung on coiled aluminum wire wrapped around the trunk. Each label includes the accession number, taxonomic name, and country of origin, if of wild provenance.

Is the condition of references produced on the proposed collection (photographs, herbarium specimens, sketches, other) adequate and up-to-date? Please specify.
MBC staff are highly committed to ensuring collections references are sufficient and up-to-date. (See plant records question above). Scientists publish research findings using MBC's Cycad Collection.

Use of Collection

Rank the collection according to use for the following purposes:

Display	**Primary**	Secondary
Education	**Primary**	Secondary
Propagation	**Primary**	Secondary
Research	**Primary**	Secondary
Conservation	**Primary**	Secondary

Collection Management

Are the growing/storage facilities (field plots, greenhouse, seed/pollen storage, laboratories, etc. as appropriate) described in the application adequate for proper collection maintenance? Please describe.

MBC's growing facilities are sufficient for proper collection maintenance. The 120-acre MBC property is broadly delineated into five geographic areas: the Coconut Grove Palmetum, the Palm Walk, Cycad Collection, the Lowland Palmetum, and Research. Growing facilities include a Plant Nursery and a Seed Bank Facility. The plant nursery complex includes three shades houses, a greenhouse, and full sun nursery that provide 16,952 ft^2 of growing space. The Seed Bank building is 25' 8" by 13' 3".

Do the growing/storage areas provide adequate security (and environmental protection as applicable) for the collection? Please describe.

MBC is adequately secured. The property is gated and partially fenced. Unfenced portions are inaccessible due to dense plant growth and swamps. Pesticides, fertilizers, and other chemicals are safely stored in a securely locked well ventilated room in the maintenance compound. Hurricane damage assessment and response protocols for MBC's Plant Collections have been developed and are revised periodically.

Is the current staffing for the care of the collection adequate? Please describe.

Yes. Twelve MBC staff members work together in three closely interrelated departments (Collections Development, Horticulture & Facilities, and Administration) in support of the Cycad Collection. This team includes two Ph.D. scientists and three M.S. (including one Ph.D. candidate), two B.S. and two B.A. staff members. Four staff members, with 30 plus years of combined horticultural experience, have responsibility for the day-to-day horticultural care of the Collection. While touring the Nursery with Vickie Murphy, Nursery Curator, and the Cycad Collection with Stella Cuestas, Curator of Cycad, it was evident that MBC addresses the cultural needs of individual cycads.

Are conditions, facilities, and staffing adequate to produce control pollinated seed or disease-free vegetative propagules of the collection? Please describe.

Yes. Since 1996 MBC has successfully hand-pollinated some of the cycads in the Cycad Collection. The resulting seeds are distributed to research institutions, botanical gardens, conservatories, plant societies and community groups worldwide. The 25' 8" by 13' 3" Seed Bank building houses the office of the Seed Bank Coordinator and provides a site for storing pollen and processing, storing and distributing seeds. The Seed Bank Coordinator oversees the collecting, cleaning, storing, and distribution of seed. A pollen bank is maintained for pollinating MBC's plant collection and MBC also supplies pollen to other gardens and institutions. MBC staff have assessed the seed bank facilities and are seeking financial support to expand and enhance the facilities.

The plant nursery complex includes three shades houses, a greenhouse, and full sun nursery that provide 16,952 ft^2 of growing space. MBC's full time Nursery Curator has 10 years of horticulture experience and is charged with identifying germination and cultivation protocols of cycads and cultivating propagules to appropriate size for planting in the ground.

Access to Collection

Do the policies for use of, and access to, this collection provide an adequate balance between access and protection? Please describe.
Yes. MBC allows reasonable access to and use of the Cycad Collection provided plant material and associated collection information is used for the common good in areas such as research, conservation, and education. Hundreds of researchers, teachers and students use the Collections annually. The Cycad Collection is accessible to the general public by appointment, with supervision, and to bon-a-fide researchers at any time. Visitors request permission form the Executive Director, Collections Manager/Botanist, or Cycad Biologist to access the collections prior to their arrival at MBC. Collection of cycad germplasm on MBC property must be pre-approved and coordinated through the Executive Director, Collections Manager/Botanist, or Cycad Biologist.

Arantza Strater, MBC Database Supervisor, totaled the shipments of MBC germplasm for 2006 and 2007 and provided the resulting figures to me. These totals include all of the germplasm distributed from MBC's collections. The grand total for 2006 and 2007 was 549,050 and 871,809, respectively. Seed Bank distribution totals for 2006 and 2007 were 549,050 and 868,243 (seeds and seedlings), respectively. Since it began in 1998 the MBC Seed Bank has distributed a grand total of 6,524,618 seeds to the Florida Nursery Growers and Landscape Association and to over 40 worldwide botanic gardens, plant societies and scientific institutions. This includes seed of rare cycads, palms, fruit trees, and flowering dicot trees.

Future Development of Collection

Does the institution have realistic and specific one-year goals for improving/expanding the collection and its management (acquisition, conservation, distribution, propagation, records management, research use, verification, vouchering, etc.)? Are the one-year goals appropriate for achieving the stated primary collection focus? Are they likely to be implemented? Please evaluate.
MBC's has realistic, specific and appropriate one-year goals for improving and expanding the Cycad Collection and its management. The goals are very likely to be implemented. Activities include collections development, expansion, care, conservation, distribution, propagation, records management, verification, vouchering and research, education and display use.

Does the institution have realistic and specific five-year goals for improving/expanding the collection and its management (acquisition, conservation, distribution, propagation, records management, research use, verification, vouchering, etc.)? Are the five-year goals appropriate for achieving the stated primary collection focus? Are they likely to be implemented? Please evaluate.
MBC's has realistic, specific and appropriate five-year goals for improving and expanding the Cycad Collection and its management. The goals are very likely to be implemented. Activities include collections development, expansion, care, conservation, distribution, propagation, records management, verification, vouchering and research, education and display use.

Summary Evaluation

Are the following criteria for a NAPCC collection as defined in "Conditions for Participation in the NAPCC" being met for this proposed collection?

	Yes	No	Conditional
Staff Commitment	X		
Documentation Commitments	X		
Collection Maintenance Commitments	X		
Collection Development/Expansion	X		
Collection Propagation	X		
Collection Access	X		

If any the above criteria are not being met, what needs to be done to meet minimum standards? Please describe.

It is the recommendation of the Site Reviewer that the proposed collection be granted:

X☐ **NAPCC Full Recognition**

☐ **Provisional Status**
Specify # of years (1-3):
List conditions to be met during this provisional period:

☐ **NAPCC inclusion not recommended at this time**
If not, why not? Please describe.

If the collection is not recommended for inclusion in the NAPCC program at this time, what changes might make the collection eligible in the future? Please describe.

Dena Rae Garner 12/12/2007
Signature of NAPCC Site Reviewer Date

North American Plant Collections Consortium
2007 Site Evaluation Report for Single Institution Application

Applicant Information

Name of Applying Institution: Montgomery Botanical Center

Name of Proposed NAPCC collection: Palm Collection

Curator of proposed NAPCC collection: Larry Noblick, Ph.D., Palm Biologist

NAPCC Site Reviewer

NAPCC Site Reviewer: Dena Rae Garvue

Institutional Affiliation: Bernheim Arboretum and Research Forest

Job Title: Horticulture Director

Telephone number of Reviewer: 502-955-8512 x 241

FAX number of Reviewer: 502-955-4039

E-Mail address of Reviewer: dgarvue@bernheim.org

Date of site visit: November 8 – 10, 2007

Proposed Collection Information

Is the primary focus of the collection as proposed in the application nationally significant? Is it practical and achievable by the applicant? Please describe.
The Montgomery Botanical Center (MBC) Palm Collection is a resource of national and world significance. Since 1932 MBC has built a comprehensive, population based collection of well-documented palms collected from the wild. MBC's documented plant collections are grown for the purposes of scientific research, conservation, education and display. As of 2006, there are 1,803 palm accessions, with 108 genera and 356 taxa represented, and 5,230 palm plants in the ground. MBC's goal is to hold and grow about half of the palm species, roughly 1,500 species of the 3,000. An average of 300 palm specimens is outplanted in the ground collection each year. Palms are planted according to a detailed landscape design that is updated annually and the Master Site Plan that was developed for the property in 1992.

Patrick Griffith, Executive Director, and Chad Husby, Collections Manager/Botanist, gave me an overview of the institution's mission and primary focus of the Palm Collection. MBC's primary focus is to build and maintain an *ex situ* conservation palm collection focused on genetic diversity. In accordance with this mission and its means, MBC directs its resources towards *ex situ* preservation of scientifically valuable palm populations. MBC continues to demonstrate that this goal is practical and achievable. The institution has a 75 year tradition of curating palm collections since Colonel Robert H. Montgomery established a 120-acre estate in 1932 to build his personal tropical plant collection. Records of MBC's palm accessions go back to 1932, and include detailed data on provenance, habitat, collector, growth and development, and horticultural care. The taxonomic and biogeographical scope of the current living Palm Collection demonstrates the ability of MBC, staff and site to support a comprehensive and exceptional palm collection.

What internal documentation is evident that the proposed collection fits into the overall mission of the applicant?
The Montgomery Botanical Center's Plant Collection Policy, website, and newsletters clearly articulate and outline the goals, purpose and mission of MBC's collections. The Plant Collection Policy was approved and adopted by the MBC Board of Directors in 2005. MBC's mission is to develop scientifically valuable collections of tropical plants, particularly palms and cycads, to advance and promote conservation, scientific investigation, educational opportunities and horticultural knowledge of tropical plants, and to exemplify excellent botanical garden design in a way that brings recognition and respect to the "Montgomery" name and enhances the field of tropical plant science.

Do the current taxonomic groupings and number of both live taxa and accessions within the existing collection appear to be accurate? Please describe.
Yes. The Montgomery Botanical Center's Palm Biology Program is led by Larry Noblick, Ph.D., a palm biologist with over 20 years of palm research and international fieldwork experience. Dr. Noblick is a recognized authority on Arecaceae, a member of IUCN/The World Conservation Union/Species Survival Commission's Palm Specialist Group, and the Administrative Secretary of the International Palm Society. Dr. Noblick conducts taxonomic and biogeographic research in palms. He is supported in the collecting and scientific activities of the Palm Program by a well qualified botanical, horticultural, and plant records staff. Dr. Noblick obtains extensive and detailed field data for each collection including herbarium vouchers and photographs, and uses the scientific literature, personal field experience and expertise, and comparisons with professionally identified herbarium vouchers to evaluate the accuracy of MBC's collections. Local and world-renown palm experts and visiting palm

scientists annotate MBC's collections and complete a MBC Palm Annotation/Verification Form. The Form is routed to the Palm Biologist and then to the Collections Database Supervisor, Collections Supervisor and Collections Specialist. All annotations are recorded and archived in a detailed plant records database. Arantza Strader, Database Supervisor, administers the MBC collections database. She demonstrated how plant records data are managed, retrieved and made available to visiting researchers. Inventory records appear accurate, complete and up-to-date for the Palm Collection.

Is the collection significant as it currently exists?
MBC's Palm Collection is of national significance as it currently exists. Over-exploitation and habitat destruction pose serious threats to palm biodiversity throughout the world. With the diversity of palm species in the wild vanishing, MBC's collections with associated detailed scientific data play an important role in regional, national and international conservation strategies. As of 2006, there are 1,803 palm accessions, with 108 genera and 356 taxa represented, and 5,230 palm plants in the ground. MBC's Palm Collection includes thousands of palms representing hundreds of species, many of which are threatened or endangered in the wild. MBC is also a registered U.S. Fish & Wildlife Service Plant Rescue Center.

To protect and perpetuate the genetic diversity of its collections, MBC actively builds its populations of palms by conducting three to five research and conservation expeditions each year to tropical regions of the world to obtain targeted propagules for the Palm Collections. Collections are primarily augmented through international collaborations. Staff work in partnership with U.S. research teams and overseas partners, generally with research botanists, professors, and botanical gardens in close proximity to the areas being collected. Sixty two MBC-sponsored collecting expeditions have been successfully completed since 1992 and information about selected expeditions is posted on MBC's website. Provenance data of individual accessions extend from 41°N through 34°S, with good representation throughout this latitudinal range. MBC uses stringent protocols for collecting in the wild, including science-based genetic sampling guidelines. Collecting protocols seek to maximize capture of populational genetic diversity of palms by collecting sufficient seed to ultimately plant at least three plants from at least five mother plants into the permanent grounds collection.

How does it relate to similar collections at other institutions within North America? Please describe.
Significant collections of palms are found at ten other North American institutions, four in Florida (Fairchild Tropical Botanic Garden, Naples Botanical Garden, and the University of Florida Tropical Research and Education Center both in Homestead and Davie), one in California (Huntington Botanical Gardens), and five in Hawaii (National Tropical Botanical Garden (Kauai), The Hawaii Tropical Botanical Garden (Hawaii), The Foster Botanical Garden (Oahu), Ho'omaluhia Botanical Garden (Oahu), and the Lyon Arboretum in Oahu). MBC's palm collections complement these collections significantly. The collections cited above are primarily display or historical collections. MBC made the long-term decision to develop scientifically useful, population-based palm collections in 1994.

Do the growing conditions, climate, existing collection, staff expertise, herbarium, library, etc., make the institution an appropriate holder of a NAPCC collection for this plant group? Please describe.
MBC is an appropriate holder of a NAPCC Palm Collection for many reasons. MBC's Palm Collection is of national significance as it currently exists. A wide biogeographic range of palm populations are cultivated and individual palms are healthy on the MBC site. Historic records indicate the property was specifically selected for its optimum growing conditions, climate, soils, and variety of natural habitats

in 1932 by Colonel Montgomery to build his personal tropical collection, particularly palms and cycads. Three similar, long-standing tropical plant collections (Fairchild Tropical Botanic Garden, USDA Chapman Field, The Kampong of the National Tropical Botanic Garden) in the area further demonstrate the suitability of the site for a palm collection.

Twelve MBC staff members work together in three closely interrelated departments (Collections Development, Horticulture & Facilities, and Administration) in support of the Palm Collection. This team is lead by Larry Noblick, Ph.D., a palm biologist with over 20 years of palm research and international fieldwork experience, and includes one Ph.D. scientist and three M.S. (including one Ph.D. candidate), two B.S. and two B.A. staff members who actively partner with universities throughout the world and area colleges. Six staff members, with 35 years of combined horticultural experience with MBC's Palm Collection, have responsibility for the day-to-day horticultural care of the Collection.

Plants in the collections receive the following routine care: appropriate site selection for outplanting, label maintenance, staking, bracing or cabling if necessary, irrigation, fertilization (3x per year: February, May/June, and November/December), pruning, provision of a weed-free environment, control of plant disorders, pests and diseases, and mulching. Hurricane damage assessment and response protocols for MBC's Plant Collections have been developed and are revised periodically. Plants are mapped, inventoried annually, and monitored regularly. Staff maintain detailed records of cultural treatments and results.

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Living plant material acquired by MBC is accessioned upon its arrival at MBC. The Nursery Curator frequently inputs data from the day propagules enter the nursery until the juvenile plants are incorporated into the ground collection. Each outplanted accession is labeled and laser survey equipment is used to precisely map each accession. From nursery to ground collection, detailed records are maintained using BG-Base™ and BG-Map™ software. Information about specific species as well as their precise location on the property can be retrieved readily. Map printouts are customized according to need. The Collections Development staff, Seedbank Coordinator, and Horticulturist work together to collect phenological data. MBC has an ongoing imaging program in which photographs are taken on a regular basis to document palm growth and development. Details on the life history of each accession are recorded regularly and stored digitally. The pertinent growth and development stages of each accession, the processes involved in pollen and seed production and harvesting, as well as plant health, care and death are recorded. Scientific research, horticultural experimentation, plant removals and relocation, natural disasters, or any other event or activity involving the plant is recorded and archived.

Are field accession labels (or seed/pollen/tissue culture labels) present and complete? Please describe.
Attractive and well maintained labels are present on individual palms in the Palm Collection. Each palm receives a permanent label when it is planted in the ground collection, and the condition of these labels is monitored regularly. The labels are engraved and are made of a durable, UV stable plastic. Labels for young and/or small palms are mounted on aluminum wire stakes. Labels for larger palms are strung on coiled aluminum wire wrapped around the trunk. Each label includes the accession number, taxonomic name, and country of origin, if of wild provenance.

Is the condition of references produced on the proposed collection (photographs, herbarium specimens, sketches, other) adequate and up-to-date? Please specify.
MBC staff are highly committed to ensuring collections references are sufficient and up-to-date. (See plant records question above). Scientists publish research findings using MBC's Palm Collection.

Use of Collection

Rank the collection according to use for the following purposes:

Display	**Primary**	Secondary
Education	**Primary**	Secondary

Propagation	**Primary**	Secondary
Research	**Primary**	Secondary
Conservation	**Primary**	Secondary

Collection Management

Are the growing/storage facilities (field plots, greenhouse, seed/pollen storage, laboratories, etc. as appropriate) described in the application adequate for proper collection maintenance? Please describe.
MBC's growing facilities are sufficient for proper collection maintenance. The 120-acre MBC property is broadly delineated into five geographic areas: the Coconut Grove Palmetum, the Palm Walk, Cycad Collection, the Lowland Palmetum, and Research. Growing facilities include a Plant Nursery and a Seed Bank Facility. The plant nursery complex includes three shades houses, a greenhouse, and full sun nursery that provide 16,952 ft^2 of growing space. The Seed Bank building is 25' 8" by 13' 3".

Do the growing/storage areas provide adequate security (and environmental protection as applicable) for the collection? Please describe.
MBC is adequately secured. The property is gated and partially fenced. Unfenced portions are inaccessible due to dense plant growth and swamps. Pesticides, fertilizers and other chemicals are safely stored in a securely locked well ventilated room in the maintenance compound. Hurricane damage assessment and response protocols for MBC's Plant Collections have been developed and are revised periodically.

Is the current staffing for the care of the collection adequate? Please describe.
Yes. Twelve MBC staff members work together in three closely interrelated departments (Collections Development, Horticulture & Facilities, and Administration) in support of the Palm Collection. This team includes two Ph.D. scientists and three M.S. (including one Ph.D. candidate), two B.S. and two B.A. staff members. Six staff members, with 35 years of combined horticultural experience with MBC's Palm Collection, have responsibility for the day-to-day horticultural care of the Collection. While touring the Nursery with Vickie Murphy, Nursery Curator, and the Palm Collection with Laurie Danielson, Curator of Palms, it was evident that MBC addresses the cultural needs of individual palms.

Are conditions, facilities, and staffing adequate to produce control pollinated seed or disease-free vegetative propagules of the collection? Please describe.
Yes. Since 1996 MBC has successfully hand-pollinated some of the palms in the Palm Collection. The resulting seeds are distributed to research institutions, botanical gardens, conservatories, plant societies and community groups worldwide. The 25' 8" by 13' 3" Seed Bank building houses the office of the Seed Bank Coordinator and provides a site for storing pollen and processing, storing and distributing seeds. The Seed Bank Coordinator oversees the collecting, cleaning, storing and distribution of seed. A pollen bank is maintained for pollinating MBC's plant collection and MBC also supplies pollen to other gardens and institutions. MBC staff have assessed the seed bank facilities and are seeking financial support to expand and enhance the facilities.

The plant nursery complex includes three shades houses, a greenhouse, and full sun nursery that provide 16,952 ft^2 of growing space. MBC's full time Nursery Curator has 10 years of horticulture

experience and is charged with identifying germination and cultivation protocols of palms and cultivating propagules to appropriate size for planting in the ground.

Access to Collection

Do the policies for use of, and access to, this collection provide an adequate balance between access and protection? Please describe.
Yes. MBC allows reasonable access to and use of the Palm Collection provided plant material and associated collection information is used for the common good in areas such as research, conservation, and education. Hundreds of researchers, teachers and students use the Collection annually. The Palm Collection is accessible to the general public by appointment, with supervision, and to bon-a-fide researchers at any time. Visitors request permission form the Executive Director, Collections Manager/Botanist, or Palm Biologist to access the collections prior to their arrival at MBC. Collection of palm germplasm on MBC property must be pre-approved and coordinated through the Executive Director, Collections Manager/Botanist, or Palm Biologist.

Arantza Strater, MBC Database Supervisor, totaled the shipments of MBC germplasm for 2006 and 2007 and provided the resulting figures to me. These totals include all of the germplasm distributed from MBC's collections. The grand total for 2006 and 2007 was 549,050 and 871,809, respectively. Seed Bank distribution totals for 2006 and 2007 were 549,050 and 868,243 (seeds and seedlings), respectively. Since it began in 1998 the MBC Seed Bank has distributed a grand total of 6,524,618 seeds to the Florida Nursery Growers and Landscape Association and to over 40 worldwide botanic gardens, plant societies and scientific institutions. This includes seed of rare cycads, palms, fruit trees, and flowering dicot trees.

Future Development of Collection

Does the institution have realistic and specific <u>one-year</u> goals for improving/expanding the collection and its management (acquisition, conservation, distribution, propagation, records management, research use, verification, vouchering, etc.)? Are the one-year goals appropriate for achieving the stated primary collection focus? Are they likely to be implemented? Please evaluate.
MBC's has realistic, specific and appropriate one-year goals for improving and expanding the Palm Collection and its management. The goals are very likely to be implemented. Activities include collections development, expansion, care, conservation, distribution, propagation, records management, verification, vouchering, and research, education and display use.

Does the institution have realistic and specific <u>five-year</u> goals for improving/expanding the collection and its management (acquisition, conservation, distribution, propagation, records management, research use, verification, vouchering, etc.)? Are the five-year goals appropriate for achieving the stated primary collection focus? Are they likely to be implemented? Please evaluate.
MBC's has realistic, specific and appropriate five-year goals for improving and expanding the Palm Collection and its management. The goals are very likely to be implemented. Activities include collections development, expansion, care, conservation, distribution, propagation, records management, verification, vouchering, and research, education and display use.

Summary Evaluation

Are the following criteria for a NAPCC collection as defined in "Conditions for Participation in the NAPCC" being met for this proposed collection?

	Yes	No	Conditional
Staff Commitment	X		
Documentation Commitments	X		
Collection Maintenance Commitments	X		
Collection Development/Expansion	X		
Collection Propagation	X		
Collection Access	X		

If any the above criteria are not being met, what needs to be done to meet minimum standards? Please describe.

It is the recommendation of the Site Reviewer that the proposed collection be granted:

X☐ **NAPCC Full Recognition**

☐ **Provisional Status**
Specify # of years (1-3):
List conditions to be met during this provisional period:

☐ **NAPCC inclusion not recommended at this time**
If not, why not? Please describe.

If the collection is not recommended for inclusion in the NAPCC program at this time, what changes might make the collection eligible in the future? Please describe.

Dena Rae Garner 12/12/2007
Signature of NAPCC Site Reviewer Date