



## Botanical Garden Collection Plan 2019

**OBJECTIVE:** *Identify* what the botanical garden plant collection should contain to satisfy our central mission of conservation, research, and education. Cultivate the collections with the aim to create Oklahoma's premiere botanical collection.

**STRATEGY:** *Develop* the botanical collection documents (i.e. a collections management policy, a collections management plan, and a collections management manual etc.). These documents will guide and give structure to the botanical collection. Cultivate and mobilize the horticulture staff to follow the collections management plan.

**TACTICS:** *Document, catalog, and place signage on* the existing collection specimens. Collect new specimens per the acquisition list for each individual collection to strengthen the collection and to create an educational experience for our guests using the botanical gardens.

### CONSERVATION

- Support the Zoo's conservation mission through the development of a diverse plant collection plan that focuses on saving rare and endangered plant species and fragile ecosystems. March 2019.
- Emphasize our most endangered plant family, the Cactaceae, by identifying a plant conservation action regarding it and connecting it to the cactus collection. April 2019.
- Develop plant conservation signage to support the botanical collections and animal habitats. May 2019.

### RESEARCH

- Research and develop an Oklahoma native plant flora.
- Collaborate with local university to develop a research program that benefits the OKC Zoo's botanical collections program.
- Find graduate students that will benefit from using the botanical collection for studies/experiments.

### COLLECTIONS

- Develop the proposed plant collections below:

- **Oklahoma Native Plant Collection:**
- **What does it mean to be a native plant? What are the benefits of using native plants in your garden? -Drought tolerance, supports native wildlife, reduces garden maintenance.**
  - **Story:** The cross-timbers ecosystem is a historic landscape that encompasses the entire zoo and majority of the surrounding community. The cross-timbers once covered 30,000 miles separating the eastern deciduous forest from the grasslands of western Oklahoma. These two ecosystems merge in this location and native plants help conserve water while providing a habitat and food source for native wildlife.
  
  - Purpose:** Provide awareness of our native ecosystem and the plants that live in Oklahoma. Tie this to animal collection where habitat loss plays a big factor in why animals are rare and endangered.
  
  - **Collection Type:** Collection of native plants endemic to a designated location or region.
  
  - **Location:** Oklahoma Trails.
  
  - **Acquisitions:** Oklahoma Native understory plants and grassland species. Oklahoma native orchids and cold hardy native cactus.
  
- **Japanese Maple Collection:**
- **Japanese maples have played a large part in Asian culture for hundreds of years. They have a rich symbolism in Asian gardening, art, and poetry. Their symbolism in Asian culture represents the welcoming of autumn as a friend, and the Japanese phrase “Momiki-gari” translates to maple hunting or maple viewing. This refers to the ritual visitation to the mountains to view maples in their autumn splendor.**
  - **Story:** Japanese maples are greatly hybridized through scientific advances in human cultivation for specific plant traits and varied morphological characteristics. Display the diversity of this genus by exhibiting dwarf, weeping, cut leaf, variegated, and unusual cultivars.
  
  - **Purpose:** Highlight the diversity of the *Acer* genus with a focus on Japanese maples deriving from *Acer palmatum*, *A. japonicum*, and *A. shirasawanum*.
  
  - **Collection Type:** Display collection of the *Acer* genus.
  
  - **Location:** Asia/Butterfly Bypass
  
  - **Acquisitions:**  
**Current species:**

- Acer palmatum* var. *dissectum* 'Red Dragon'
- Acer palmatum* var. *dissectum* 'Viridis'
- Acer palmatum* 'Goshiki Kotohime'
- Acer palmatum* 'Koto-No-Ito'
- Acer palmatum* 'Nishiki Gawa'
- Acer palmatum* 'Sharp's Pygmy'
- Acer palmatum* 'Japanese Sunrise'

**Future Species:**

- Acer palmatum* 'Bloodgood'
- Acer palmatum* var. *dissectum* 'Tamukeyama'
- Acer palmatum* var. *dissectum* 'Crimson Queen'
- Acer palmatum* 'Katsura'
- Acer palmatum* 'Red Spider'
- Acer palmatum* 'Ukigumo'
- Acer palmatum* 'Sango Kaku'
- A. japonicum* sp.
- A. shirasawanum* sp.

▪ **Conifer Collection:**

- **Conifers are an ancient group of plants dating back 300 million years. Many of our modern conifers are recognizable from fossils dating back to 60-120 million years ago. Conifers have been around since prehistoric times. Dinosaur plant life.**

- **Story:** Coniferous plants create seeds produced in cones. This distinguishing characteristic is synonymous with the gymnosperm vascular plant group and differs greatly from the flowering plant group of angiosperms.
- **Purpose:** Create seasonal interest through various forms of conifers and highlight the main difference between gymnosperms (naked seed) and angiosperms (flowering seed).
- **Collection Type:** Display collection of evergreen and deciduous conifers.
- **Location:** Education building garden beds.
- **Acquisitions:**

**Current Species:**

- Cedrus atlantica* 'Glauca Pendula' Blue Atlas Cedar
- Cedrus deodara* 'Prostrata' Weeping Himalayan Cedar
- Ginkgo biloba* 'Bon's' Dwarf Ginkgo
- Cedrus libani* 'Green Prince' Cedar of Lebanon
- Juniperus procumbens* 'Greenmound' Japanese Garden Juniper
- Juniperus horizontalis* 'Monber' Icee Blue Juniper
- Pinus strobus* 'Horsford' Eastern White Pine

- Pinus nigra* ‘Hornibrookiana’ Dwarf Austrian Pine
- Pinus densiflora* ‘Umbraculifera compacta’ Dwarf Tanyosho Pine
- Pinus densiflora* “Pendula” Japanese Red Pine
- Juniperus chinensis* ‘Torulosa’ Hollywood Juniper

**Future Species:**

-New cultivars of conifer species and dwarf conifer species that save space in the collection area.

▪ **Pine Collection:**

- **A friend of winter, the pine tree symbolizes peace and In Japanese culture, the pine tree is known to represent longevity, good fortune and steadfastness. It is commonly linked with virtue and long life, even immortality. The pine tree is iconic of the Japanese New Year, as a symbol of rebirth, renewal, and a bright (hopeful) future.**

- **Story:** Pines can be hard to identify between the many different species within the genus, *Pinus*. This is a great opportunity to display them together for education on pine identification and to talk about using plant morphology in identification and plant classification regarding taxonomy.
- **Purpose:** Display a broad variety of pine tree species in a small area to aid in easy identification by determining the difference in each tree species through the varying morphological features and to train in proper tree identification.
- **Collection Type:** Display collection of trees from the genus, *Pinus*.
- **Location:** From DMA to gate 10.
- **Acquisitions:**
- **Current Species:**
  - Pinus Nigra* Austrian pine
  - Pinus sylvestrus* Scot’s Pine
  - Pinus densiflora* ‘Umbraculifera’ Tanyosho Pine
  - Pinus densiflora* ‘Pendula’ Japanese Red Pine
  - Pinus strobus* Eastern White Pine
  - Pinus nigra* ‘Oregon Green’ Austrian Pine
  - Pinus leucodermis* ‘Irish Bell’ Austrian Pine
  - Pinus thunbergii* ‘Thunderhead’ Japanese Black Pine
- **Future Species:**
  - Pinus mugo* ‘Big Tuna’ Mugo Pine
  - Pinus ponderosa* Ponderosa Pine
  - Pinus thunbergii* Japanese Black Pine

- Pinus elliottii Slash Pine
- Pinus contorta var. contorta Shore Pine
- Pinus aristata Bristlecone pine
- Pinus leucodermis Bosnian Pine
- Pinus edulis Pinyon Pine
- Pinus bungeana Lacebark Pine

- **Cactus Collection:**

- **Cactus are highly developed to survive in harsh desert environments.**

**They flourish in areas where other flowering plants cannot survive.**

**They are used for food and medicine by Native American tribes and**

**early settlers. Cactus are endangered in the wild due to over collection.**

- **Story:** Plants can be endangered too! The cactus family Cactaceae is the most endangered plant family on earth.
- **Purpose:** Display all growth forms of cactus species to show the diversity of this plant family and highlight the critical conservation status of the Cactaceae due to collection. Use plant signage to focus on the fact that plants can be endangered just like animals.
- **Collection Type:** Display plant collection of various forms from the plant family, the *Cactaceae*.
- **Location: Cat Forest.**
- **Acquisitions:**
- **Current Species:**
  - Mammillaria sp.
  - Opuntis sp.
  - Echinocereus sp.
  - Echinnocactus sp.
  - Escobaria sp.
  - Cylindropuntia sp.
  - Corypantha sp.
  - Euphorbia sp.
- **Future Species:**
  - Mammillaria sp.
  - Opuntis sp.
  - Echinocereus sp.
  - Echinnocactus sp.
  - Escobaria sp.
  - Cylindropuntia sp.
  - Corypantha sp.
  - Pachycereus

- Stenocereus
- Euphorbia sp.
- Astrophytum sp.
- Ferocactus sp.

- **Aloe Collection:**
- **Aloes have long provided food and medicine for humans. They are prized for their medicinal powers and are in a large amount of products we use daily.**
  - **Story:** Plants in the genus, *Aloe*, are one of the oldest recorded medicinal plants on record. It is found in a number of useful medicines and foods. Aloe is farmed for its medicinal properties and is endemic to southern and eastern Africa.
  - **Purpose:** Display aloes of significant forms and ones that have medicinal properties/food functions. Display the aloes of southern and eastern Africa.
  - **Collection Type:** Display collection of aloes primarily from Africa.
  - **Location:** Africa
  - **Acquisitions:**
  - **Current Species:**
    - Aloe* sp.
  - **Future Species:**
    - Aloe arborescens*
    - Aloe cooperi*
    - Aloe dichotoma*
    - Aloe ferox*
    - Aloe maculata*
    - Aloe microstigma*
    - Aloe perfoliata*
    - Aloe striata*
    - Aloe tenuior*
    - Aloe variegata*
    - Aloe barbadensis* syn. = *Aloe vera*
- **Asian Plant Collection:**
  - **Story:** Asian plants cover a large region of the world with 30,000 plants native to China alone. This represents one eighth of the plant life on earth.
  - **Purpose:** Highlight plant life endemic to Asia and are common to Oklahoma gardeners.

- **Collection Type:** Display collection of plants endemic to Asia.
- **Location:** Sanctuary Asia
- **Acquisitions:**
- **Current Species:**
  - Acer ginnala* Amur Maple
  - Albizia julibrissin* Mimosa
  - Catalpa bungei* Catalpa
  - Chionanthus retusus* Chinese Fringe Tree
  - Pistachia chinensis* Chinese Pistach
  - Firmiana simplex* Chinese Parasol Tree
  - Juniperus chinensis* Chinese Juniper
  - Koelreuteria paniculata* Golden Rain Tree
  - Kerria japonica* Japanese Rose
  - Pinus thunbergii* Japanese Black Pine
  - Metasequoia glyptostroboides* Dawn Redwood
  - Paulonia tomentosa* Royal Empress Tree
  - Trachycarpus fortunei* Windmill Palm
- **Future Species:**
  - Asian tropical species of merit.
- **African Plant Collection:**
  - **Story:** Many common plant species found in Oklahoma are native to the African continent.
  - **Purpose:** Establish a connection between Oklahoma and African ecosystems.
  - **Collection Type:** Display collection of African plant species.
  - **Location:** Africa.
  - **Acquisitions:**
  - **Current Species:**
    - Cynodon dactylon* Bermuda
    - Cedrus atlantica* Blue Atlas Cedars
    - Pennisetum* sp.
    - Delosperma* sp.
    - Kniphofia* sp.
  - **Future Species:**
    - African cold hardy and tropical species of merit.
- **The following list of African plants have been added to research cold hardiness.**

- -Acmadenia
- Acokanthera oblongifolia
- Acokanthera rotundata
- Acridocarpus natalitius
- Acrolophia
- Adenium swazicum
- Adiantum aethiopicum
- Adiantum hispidulum
- Aerva lanata
- Afrocarpus falcatus
- Agathosma elegans
- Agelanthus natalitius
- Alberta magna
- Albizia suluensis
- Aloe humilis
- Aloidendron tongaense
- Ancylobothrys capensis
- Anisodonte
- Anisodonte elegans
- Annona senegalensis
- Anthehora pubescens
- Apodytes dimidiata
- Arctotheca calendula
- Arctotheca populifolia
- Arctotheca prostrata
- Asparagus asparagoides
- Atlantis Sand Fynbos
- Aulax
  
- Baeometra
- Barleria elegans
- Barleria mysorensis
- Barleria obtusa
- Bauhinia bowkeri
- Blidingia marginata
- Blidingia minima
- Boscia foetida
- Brabejum
- Brachylaena discolor
- Breonadia salicina
- Bryopsis africana
- Buddleja auriculata
- Buddleja dysophylla
- Buddleja glomerata
- Buddleja loricata
- Buddleja pulchella

- Buddleja saligna
- Buddleja salviifolia
- Bulbine bruynsii
- Bulbinella elegans
- Burchellia bubalina
- Buxus macowanii
  
- Calpurnia (plant)
- Canthium inerme
- Carissa bispinosa
- Carissa tetramera
- Cassia abbreviata
- Cassytha filiformis
- Celtis africana
- Ceraria namaquensis
- Chasmatophyllum
- Chrysophyllum viridifolium
- Cineraria longipes
- Cineraria lyratiformis
- Citrullus ecirrhosus
- Cladostemon
- Clematis brachiata
- Coleonema pulchellum
- Commiphora schimperi
- Conophytum
- Conophytum elegans
- Cotula coronopifolia
- Crassula natans
- Crassula sarcocaulis
- Crinum macowanii
- Croton sylvaticus
- Cunonia capensis
- Curtisia
- Cussonia paniculata
- Cyathea capensis
- Cyperus congestus
- Cyperus vorsteri
  
- Delairea
- Delairea odorata
- Diastella
- Diastella fraterna
- Dichapetalum cymosum
- Dicoma pretoriensis
- Dicoma zeyheri
- Dimorphotheca ecklonis

- *Dimorphotheca pluvialis*
- *Dioscorea elephantipes*
- *Diospyros whyteana*
- *Dipogon lignosus*
- *Dodonaea angustifolia*
- *Dorotheanthus bellidiformis*
- *Dovyalis caffra*
- *Drimiopsis maculata*
- *Drosanthemum floribundum*
  
- *Elephantorrhiza burkei*
- *Empleurum unicapsulare*
- *Empogona africana*
- *Encephalartos paucidentatus*
- *Erianthemum dregei*
- *Eriocephalus africanus*
- *Erythrina zeyheri*
- *Euclea racemosa*
- *Eugenia capensis*
- *Eugenia umtamvunensis*
- *Euphorbia ingens*
- *Euphorbia rowlandii*
- *Euphorbia virosa*
- *Euryops acraeus*
- *Euryops pectinatus*
  
- *Fanninia*
- *Faucaria felina*
- *Faucaria tigrina*
- *Faurea macnaughtonii*
- *Felicia amelloides*
- *Felicia echinata*
- *Felicia erigeroides*
- *Frithia humilis*
- *Frithia pulchra*
  
- *Galenia secunda*
- *Gasteria armstrongii*
- *Gazania linearis*
- *Gazania rigens*
- *Geissoloma*
- *Gerbera jamesonii*
- *Gossypoides kirkii*
- *Grewia occidentalis*
- *Gymnosporia bachmannii*
- *Gymnosporia buxifolia*

- *Haemanthus pubescens*
- *Halleria lucida*
- *Haworthia chloracantha*
- *Haworthia floribunda*
- *Haworthia herbacea*
- *Haworthia lockwoodii*
- *Haworthia mutica*
- *Haworthia parksiana*
- *Helichrysum petiolare*
- *Helichrysum pumilio*
- *Hexacyrtis*
- *Homalium rufescens*
- *Hyaenanche*
- *Hydrocleys*
- *Hyparrhenia hirta*
- *Hypolepis sparsisora*
  
- *Ilex mitis*
- *Ipomoea simplex*
- *Isoetes eludens*
- *Isoetes toximontana*
- *Isoglossa ciliata*
- *Isoglossa woodii*
- *Isolepis prolifera*
  
- *Jasminum abyssinicum*
- *Jasminum multipartitum*
- *Jasminum tortuosum*
- *Jensenia spinosa*
- *Jordaaniella anemoniflora*
- *Jordaaniella dubia*
  
- *Kalanchoe longiflora*
- *Kalanchoe thyrsiflora*
- *Keetia gueinzii*
- *Khadia beswickii*
- *Knowltonia capensis*
- *Knowltonia vesicatoria*
- *Gazania krebsiana*
  
- *List of invasive species in South Africa*
- *Lagenaria sphaerica*
- *Launaea sarmentosa*
- *Leobordea adpressa*
- *Leucadendron gandogeri*
- *Leucadendron xanthoconus*

- *Ligustrum lucidum*
- *Lithops aucampiae*
- *Lithops bromfieldii*
- *Lobelia erinus*
  
- *Manilkara nicholsonii*
- *Martensia elegans*
- *Maytenus oleoides*
- *Maytenus tenuispina*
- *Melianthus comosus*
- *Melianthus major*
- *Melolobium subspicatum*
- *Merciera*
- *Mesembryanthemum*

## EDUCATION

- Base botanical garden tours on plant collections.
- Develop the educational classes around the plant collections.

## Formal Garden Transition Plan 2019

### Entry Plaza

- Apply granular pre-emergent to garden beds around 9/18 and again in March, June, and September.
- Install evergreen boxwood hedge around upper and lower old plaza beds to create a knot rose garden.
- Spring annual beds planted (5/19) annually in May.
- Fall annual beds planted (10/18) annually in October.
- Spring hanging baskets on display.
- Fall hanging baskets on display (10/19).
- Spring pottery planted (plaza/parking lot 5/19).
- Fall pottery planted (plaza/parking lot (10/19).
- Install groundcover in exterior plaza annual beds.

### Parking Lot

- Apply granular pre-emergent to garden beds around 9/18 and again in March, June, and September.
- Install new mulch as needed on a weekly basis.
- Refresh mulch by turning over quarterly (Jan, Apr, Jul, Oct).
- Replace Caddo maples shantung maples
- Install plant barrier along the handicap-parking wall with yucca and opuntia.

### Secret Garden

- Apply granular pre-emergent to garden beds around 9/18 and again in March, June, and September.
- Trim mulberry tree and prune pines as needed.
- Complete mulching on the CZ switchback.
- Extend mulch to the east to soften the space between the canopy and the garden.
- Replace expired perennial plants in early spring to continue the design.
- Add more black rock to the fountain in spring.
- Check DG pathway spring and fall for updates.
- Work on bed across from the top of the slide. Remove grasses and rock.
- Work on bed in front of bathrooms. Remove grass and daylilies.
- Work on bed at entrance ramp. Thorough weeding and maple tree pruning.

### **Pine Collection**

- Apply granular pre-emergent to garden beds around 9/18 and again in March, June, and September.
- Remove crepe myrtles, roses, and smoke tree.
- Remove fir tree when a larger specimen is available.
- Plant Austrian pines at gate 10 to hide electric component.
- Plant Tanyosho pine.
- Install plant signage.
- Limb up hackberry.
- Limb up oak.

### **Conifer Collection**

- Apply granular pre-emergent to garden beds around 9/18 and again in March, June, and September.
- Remove or hard prune Himalayan cedar.
- Root prune and remove ginkgo-transplant to Asia gardens.
- Plant new specimen Ginkgo.
- Remove Hollywood juniper.
- Dig out equisetum ground cover.
- Transplant amaryllis.
- Install plant signs.
- Source and plant new specimens.
- Plant evergreen shrub border.

### **Cactus Garden**

- Apply granular pre-emergent to garden beds around 9/18 and again in March, June, and September.
- Source and plant all cold hardy native cactus species.
- Display tropical cactus by June 1 each season. Off display October 1.
- Install plant signs for all plantings.
- Create signs for cactus conservation messaging.
- Remove dead trees and junipers on the south berm to eliminate shade and create space.
- Re-design dry riverbed.

### **Cactus Spot-(Across from Canopy)**

- Apply granular pre-emergent to garden beds around 9/18 and again in March, June, and September.
- Remove nut sedge.
- Install new dg.
- Mulch hillside after tulip install.
- Create view of treehouse by removing selected rose of Sharon.
- Organize red rock or remove.
- Seasonal install of tropical agave and cactus. On display June 1. Off display Oct. 1.
- Source and plant cold hardy cactus, agave, and yucca.
- Move Yucca from gate 4 bed and plant.

### **Water Conservation Garden**

- Limb up all trees.
- Sign champion Arizona cypress.
- Add rock to strengthen terraces (use rock removed from cactus spot).
- Install new mulch.
- Install new plants.
- Install plant signs.
- Source and plant cold hardy cactus, agave, and yucca.
- Remove selected trees to eliminate full shade.

### **Butterfly Garden**

- Remove nandina and selected viburnum on bypass.
- Install mulch and remove crepe myrtles, abelia, and overgrown crowded plantings.
- Acquire all Oklahoma native asclepias species.
- Add new plant signs to all host and nectar plantings.
- Remove plants off pathways.
- Prune oaks in the area.
- Over seed hillside with pollinator wildflower mix.
- Clean out pond and reimagine.

### **Asian Gardens**

- Install mulch on switchback and strengthen mulch around lotus pavilion as needed.
- Apply granular pre-emergent to garden beds around 9/18 and again in March, June, and September.
- Weed and cut back plant material from along the pathway around the Zooseum.
- Weed the Asia switchback.
- Weed and cut back around the berm on the east side of yard 2.
- Transplant lotus pavilion tropical into bigger storage pots.

### **Picnic Gardens**

- Install mulch (12/18)
- Apply granular pre-emergent to garden beds around 9/18 and again in March, June, and September.

- Install turf to bring up grade in the great lawn and over seed with fescue in spring/fall (work with grounds department on this).
- Prune all oaks.
- Install plant signs.
- Early spring plant perennial replacements.
- Weed canal garden as needed.
- Prune forsythia after first spring bloom to form.
- Install extra Asiatic jasmine