

The New York Botanical Garden Collections Master Plan

Quercus

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I. Introduction

Mature oaks, both planted and preexisting, dominate The New York Botanical Garden's landscape. A variety of native species grow throughout the Botanical Garden's grounds and Forest. Many of these existing specimens are over 200 years old. The Oak Collection, located along Magnolia Way, is one of three intact systematic collections that remain from the original Deciduous Arboretum established in 1896. Here mature native species, exotic species, and hybrids grow side by side.

The Garden's oak collection is aging. Very few middle-aged specimens and almost no young specimens are present. This presents a problem if the Garden hopes to maintain the abundance of mature oaks that create the distinctive character of the landscape. The loss of some of the oldest mature oaks in the Forest in recent droughts and severe storms underscores the importance of maintaining a wide range of species and age classes in the living collections. Since oaks are so widespread at the Garden, new specimens could be planted on any appropriate site across the Garden's 250-acre landscape.

II. Analysis

A. Summarize taxonomic diversity of Collection or Garden

The Garden's oak collection includes primarily regionally native species and hybrids. Only a fraction of the European, Asian, and other North American taxa hardy in our climate are present.

B. List noteworthy taxa and specimens

Noteworthy introduced oaks in the Garden's living collections include a mature *Quercus dentata* at the Mosholu Gate, a massive *Quercus cerris* in the Oak Collection, and a large *Quercus acutissima*, also in the Oak Collection. The long list of spectacular native specimens is highlighted by a *Quercus coccinea* planted along Conservatory Drive, a pair of *Quercus alba* in the Benenson Ornamental Conifers, a grove of *Quercus bicolor* at the south end of Azalea Way, and a towering *Quercus velutina* in the Rock Garden. A large specimen of *Quercus glauca* is in House 4 of the Enid A. Haupt Conservatory.

C. Evaluate how the Collection or Garden is displayed to the public (design, location, accessibility, etc.)

The primary oak collection along Magnolia Way is beautifully planted, with each given enough space to mature gracefully. The trees within the oak collection are easily accessible. However, some of the paths and access areas surrounding the trees are in need of renovation. The oak specimens throughout the rest of the Garden are accessible from the main trails and pedestrian paths.

The large *Quercus glauca* in the Conservatory provides scale and form to changing exhibitions.

D. Evaluate how the Collection or Garden is interpreted

There currently is no interpretation specifically for the oak collection.

The New York Botanical Garden Collections Master Plan
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E. Evaluate the current level of horticultural care (pest and disease problems, siting, maintenance concerns, etc.)

It is imperative that the oaks are monitored and managed to prevent virulent diseases and aggressive insects from devastating the collection. The most severe disorders affecting oaks in North America are Sudden Oak Death, Oak Wilt, Bacterial Leaf Scorch, and Asian Longhorned Beetle. Oaks growing in the Benenson Ornamental Conifers and in the landscape around the Library building are well maintained. Specimens in the primary oak collection have received less attention and are in need of remedial pruning. As of yet, there is no tree care program tailored specifically to oaks in the Garden.

III. Recommendations

A. How should the diversity of the Collection or Garden evolve?

The diversity of the oak collection should be expanded. The hardy oak species of the world should be well represented. The changing climate may allow the expansion of the oak collection to include evergreen taxa not normally considered hardy here. The Garden should begin testing evergreen oaks native to Mexico and Central America, the western and southern United States, Asia, and Europe for their suitability to our climate. Whenever possible, new accessions should be of documented wild provenance, preferably grown from seed. Collaborating with Garden scientists, other botanical institutions, and members of the North American Plant Collections Consortium (NAPCC) will make the acquisition of wild collected material possible.

B. Are there any specific taxa or groups not present that should be included?

North American oaks:

Quercus acerifolia, *Q. ajoensis*, *Q. arkansana*, *Q. beadlei*, *Q. × beckyae*, *Q. boyntonii*, *Q. buckleyi*, *Q. bushii*, *Q. champmannii*, *Q. × descarta*, *Q. falcata*, *Q. fusiformis*, *Q. gambelli*, *Q. garryana*, *Q. georgiana*, *Q. gravesii*, *Q. humidicola*, *Q. kellogii*, *Q. × leana*, *Q. margaretta*, *Q. × macnabiana*, *Q. moultonensis*, *Q. muehlenbergii*, *Q. oblongifolia*, *Q. oglethorpensis*, *Q. pagoda*, *Q. prinoides*, *Q. pumila*, *Q. × rehderi*, *Q. sinuata*, *Q. stellata*, *Q. × sterrettii*, *Q. × tottenii*, *Q. undulata*, *Q. virginiana*, *Q. wislezenii*.

Mexican and Central American oaks:

Quercus × basaseachicensis, *Q. benthamii*, *Q. brandegeei*, *Q. cedrosensis*, *Q. dumosa*, *Q. excelsa*, *Q. lancifolia*, *Q. macdougallii*, *Q. miquihuanensis*, *Q. pedunculosa*, *Q. rugosa*, *Q. rhysophylla*, *Q. skutchii*, *Q. tomentella*, *Q. undata*, *Q. viminea*.

Asian oaks:

Quercus acrodonta, *Q. aliena* var. *aliena*, *Q. aliena* var. *pekingensis*, *Q. aquifolioides*, *Q. championii*, *Q. dentata* 'Pinnatifida', *Q. engleriana*, *Q. fabri*, *Q. glauca*, *Q. globosa*, *Q. griffithii*, *Q. ithaburensis*, *Q. macranthera*, *Q. monimotricha*, *Q. morii*, *Q. pontica*, *Q. rehderiana*, *Q. semicarpifolia*, *Q. spinosa*, *Q. variabilis*, *Q. yunnanensis*.

European oaks:

Quercus aucheri, *Q. castanaeifolia*, *Q. crenata*, *Q. delchampii*, *Q. × hispanica*, *Q. ilex*, *Q. mas*, *Q. petraea*, *Q. suber*, *Q. × turneri*.

C. How could the Collection be displayed more effectively or what changes would you make to the Garden's design?

More than any other tree, mature oaks define the Garden's landscape. Unfortunately, there are relatively few young and middle-aged oaks in the living collections. To address this, new oak specimens should be considered for planting wherever space and aesthetic concerns call for a large tree. While the historic oak collection contains little room for new specimens, specimens in poor condition should be removed. This will create space for future plantings.

D. How could interpretation be improved?

The age and beauty of the oaks presents an excellent opportunity for interpretation. Topics could include the care of mature trees, the role of oaks in native ecosystems, and biogeography. Courses tailored to the appreciation and care of mature trees would be an interesting addition to the Home Gardening Center and Continuing Education programming. As staff time allows, the vouchering of herbarium specimens should be collected and submitted to the William and Lynda Steere Herbarium. Identification will then be verified by experts and contacts in the North American Plant Collections Consortium (NAPCC). This will increase the value of the oak collection by validating specimen identification.

E. How could horticultural care be improved?

The Garden should institute a program of tree care specifically tailored to mature specimen trees. This would include continuing the installation of mulched rings around selected specimens to reduce competition from turf for water and nutrients. It also would include the reduction of soil compaction using compressed air and/or injected nitrogen gas.

Currently, part of the oak collection on Magnolia Way is overgrown and has not been maintained to the same standards as other portions of the collection. The elimination of weed trees, eradication of invasive species, and care of individual specimens will enhance the appearance of the area and make it more accessible.

To continue the development of the collection, there is a need for a propagation area for woody plants. Currently, the Garden has access to wild collected seed of oak species but has no nursery area for growing plants to planting size. An in-ground nursery and woody plant propagation facility would greatly benefit the development of all the woody plant collections.

IV. Plan

Mature oaks form the arboreal framework of the Garden. Many of the impressive trees are native oaks that have been growing here since before the Garden was established on this site. Existing oaks will continue to receive excellent care, and as new methods for the care of mature oaks are developed, they will be implemented. New taxa will be sourced, obtained, and planted in the oak collection and throughout the grounds where large trees are appropriate. Interpretive signs and a guidebook will be created for the oak collection.