October 2009

City Park Arboretum Master Plan

Denver Parks and Recreation

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Crabapple and Lilac Collections in City Park

1 Background

The history of City Park is embodied in its trees. Since the park's earliest development in the 1880's, each generation of Denver residents has contributed to the remarkable collection of trees evident in the park today. Historically, civic leaders built City Park to create an oasis of shade and respite from the harsh prairie landscape of 19th century Denver. Planting trees was one of the first steps in creating the park landscape. Since the beginning of the park's history, annual events were held so that everyone, from mayors to school children, could participate in organized efforts to plant trees in the park. As a result of these early efforts, generations of residents and their families have been able to enjoy recreating in the shade of the park's stately trees.

During the 1950's City Park was the site of the original Denver Botanical Gardens and several areas in the park were developed with woody and herbaceous plant collections. The Botanic Garden in City Park was short-lived and eventually moved to its current location at 9th and York Street beginning in 1958. Nevertheless, several of the woody plant collections still remain in City Park today.

With over 3300 trees in the 320 acre park, City Park contains one of the largest number of trees in a single location in Denver. City Park is also the largest urban greenspace in Denver and one of the best places where residents can see examples of the wide range of tree species that make up Denver's urban forest. Over 100 different tree species are represented in the park and several notable plant collections from the Botanical Garden era are on display such as the Pinetum, Crabapple and Lilac Collections. State champion listed trees and several unusual tree specimens can also be seen in the park. Other than the brief period to develop the Botanical Gardens, the park's tree plantations were primarily a means for creating a recreational space and not selected to establish an arboretum. Despite this factor, each generation added to the diversity and variety of the tree canopy, and the resulting tree collection has become an important resource worthy of recognition and management.

Purpose of the Arboretum

The trees in City Park are highly appreciated for their seasonal beauty, framing park vistas and shaping attractive settings for recreation. What is less well known is that the number of trees, variety of species, age diversity, unique specimens and attributes of the park's trees have grown into a distinguished tree collection. The casual park visitor is unaware of the remarkable educational and environmental value of the the park's tree resources. In addition, the park tree health and canopy may be declining. These factors indicate the tree resources may be underappreciated and a new emphasis in management is needed. The purpose of this plan is to provide guidance for creating a concerted,

purposeful effort to celebrate and enhance the park's tree collection as a distinct feature of the park and improve management the park's trees for the future.

A traditional arboretum is commonly understood to be a collection of woody plants including trees and shrubs cultivated for scientific, ornamental, or other education purposes. The word arboretum stems from the Latin *arbor* – "tree" with the suffix *–etum*, indicating "place". In City Park, the intent of the arboretum is not to emphasize scientific research but rather to focus on the enjoyment and appreciation of the park's trees as an aspect of the recreational purpose of the park.

Establishing an arboretum in City Park will showcase the existing trees in an important "tree place" and create new opportunities for the general public to learn about and appreciate their community resources. While City Park is first and foremost a public recreational space, it also has important historic, cultural and ecological values that are celebrated and protected. An arboretum complements these values and adds yet another set of tools to preserve the park's resources and provide access for their enjoyment and study.

The timing for establishment of a City Park Arboretum is opportune since it reinforces the objectives of the Million Tree Initiative launched in 2006 by Mayor John Hickenlooper. This ambitious tree planting program in Denver, has a goal of adding one million new trees in the metropolitan area by the year 2025. With the heightened awareness and interest in local tree resources, it is an ideal time to take advantage of the momentum built around this effort to launch a new local arboretum.

Scope of the Plan

The scope of this report is to:

- document and evaluate the existing condition of the park's tree collection
- establish a vision for an arboretum that complements the park's overall mission and the *2001 City Park Historic Landscape Assessement and Master Plan*
- establish a tree planting framework that preserves existing collections and incorporates new collections
- identify park improvements to implement the arboretum objectives
- promote public awareness and education about the values of the park's trees
- develop management strategies to sustain healthy and long-lived tree plantings

This report is focused on the park's trees. However, the park's shrub and herbaceous collections are also important attributes that contribute to the arboretum setting and botanical interest. While the park trees form the backbone of the arboretum, separate studies should be undertaken in the future to address shrubs and other plants complementary to the overall framework.

Values and Vision

Establishing an arboretum in City Park is a unique opportunity to promote and enhance many of the park's values.

Historic Landscape Values

City Park's design and mature landscape are associated with distinguished figures in Denver's history such as Mayor Robert Speer, and landscape architects Frederick Law Olmsted, Jr. and Saco Rienk DeBoer. Each of them contributed to significant periods of landscape development which are present in City Park today. Trees are essential for defining the historic character of the park as documented in

the *2001 City Park Historic Landscape Assessement and Master Plan*. Protecting and preserving these patterns is the foundation on which to build the arboretum vision for the future.

Park Values

City Park is a spectacular urban green space just east of downtown Denver and provides important recreational experiences and respite easily accessible to thousands of residents. It welcomes visitors to walk, bicycle, picnic, play, take photographs and enjoy its serene, pastoral ambiance. The social value of trees is readily recognized as residents recreate in the park. The variety of landscapes ranging from shaded woods to open grassy meadows, lush gardens, wetlands and native plantings offer an abundance of opportunities for interest and inspiration. The arboretum will preserve and enhance these park values.

Tree Values

Denver Parks and Recreation is the primary steward of all trees on public lands in Denver. Trees are an extremely valuable resource that not only provide attractive landscapes, but also replenish oxygen in the atmosphere, cool us with shade in the summer and help clean the air. Improving the understanding of different tree species, urban forestry management and applying new knowledge in an arboretum advances the stewardship skills of the professional community and the general public. Objectives such as promoting a broad and diverse tree canopy in Denver and establishing public programs that promote the value of trees will be further supported by an arboretum in City Park.

Vision

The City Park Arboretum will provide the public an educational tree collection that is diverse, sustainable and honors City Park's historic landscape legacy.

2 Conceptual Framework

The distinctive, bucolic landscape of City Park developed over several generations of thoughtful planning and design. Important landscape architects and designers including Reinhard Schuetze, Frederick Law Olmsted, Jr, George Kessler and Saco Rienck Deboer enhanced the park by adding new layers of richness, diversity and character during distinctive periods of the park's historic development. In keeping with this tradition of renewal and enhancement, the arboretum plan will offer a new means to enrich the park's heritage by focusing on trees and arboriculture. This plan will create a

Trees on west side of City Park

new layer of interest by elaborating on the extraordinary collection of mature trees in City Park. New plantings, education, interpretation, and connections between the park's natural resources and the community will be the hallmarks of the plan. A key objective for the planning effort is to evaluate and develop recommendations for improvements to the park while still remaining true to its heritage.

The arboretum concept will focus around 5 major areas of renewal and enhancement:

1. Manage the historic park landscape patterns based on the *2001 City Park Historic Landscape Assessment and Master Plan* recommendations
2. Diversify and supplement the historic landscape patterns with new tree plantings to improve the long term health and sustainability of the park's tree collection and enhance educational opportunities
3. Rehabilitate, expand and interpret existing specialized plant collections and develop new appropriate collections
4. Establish a tree walk through the park as the primary organizing structure for the arboretum interpretive displays and creating educational opportunities ranging from self-guided walks to formally guided programs
5. Develop consistent, attractive and interesting interpretive displays and materials

The conceptual framework also incorporates the findings of a comprehensive analysis of the park's trees. Diversity, tree counts, condition and canopy patterns were analyzed to establish management objectives. See *Appendix A.*

Historic Landscape Patterns

The pattern of tree groves and open meadows is the essential characteristic of the historic pastoral setting of the park. Maintaining these patterns is critical to preserving the historic values in the park. The *2001 City Park Historic Landscape Assessment and Master Plan* identified preserving the landscape patterns as a primary goal and preventing impairment of the park's character from inappropriate tree plantings such as placing trees in historic open meadows. In addition to the patterns of meadows and wooded areas, there are a variety of other landscape spaces, gardens and features that are key to the park's historic character and are equally important to protect. A system of landscape zones establishes management objectives for each character-defining space of the park and preserves each landscape type for the long-term future. Six landscape zones (see City Park Landscape Zones map) have been established to manage the park landscape as follows:

Woods Zone

The character of this zone is a shaded, enclosed park experience. An informal arrangement of trees and tree groves dominate the landscape. The tree canopy should be mostly dense and enclosed with few openings. The ground cover should be mostly mowed turf. Shrubs and understory trees should be located along the perimeter of the zone.

Meadow Zone

The character of this zone is a sunny, open park experience. Mowed turf should dominate these broad expanses of open areas in the park. The meadow edges should flow irregularly to create a naturalistic effect. Specimen shade trees might punctuate the landscape in selected areas but should generally not be present in the meadow zone. Existing shade trees currently located in the meadow zones should be transplanted to another zone or not replaced if damaged or lost.

Historic Structure Zone

This zone is primarily characterized by a historic

Tree planting in City Park, ca. 1900

Photo courtesy of Denver Public Libray - Western History Collection

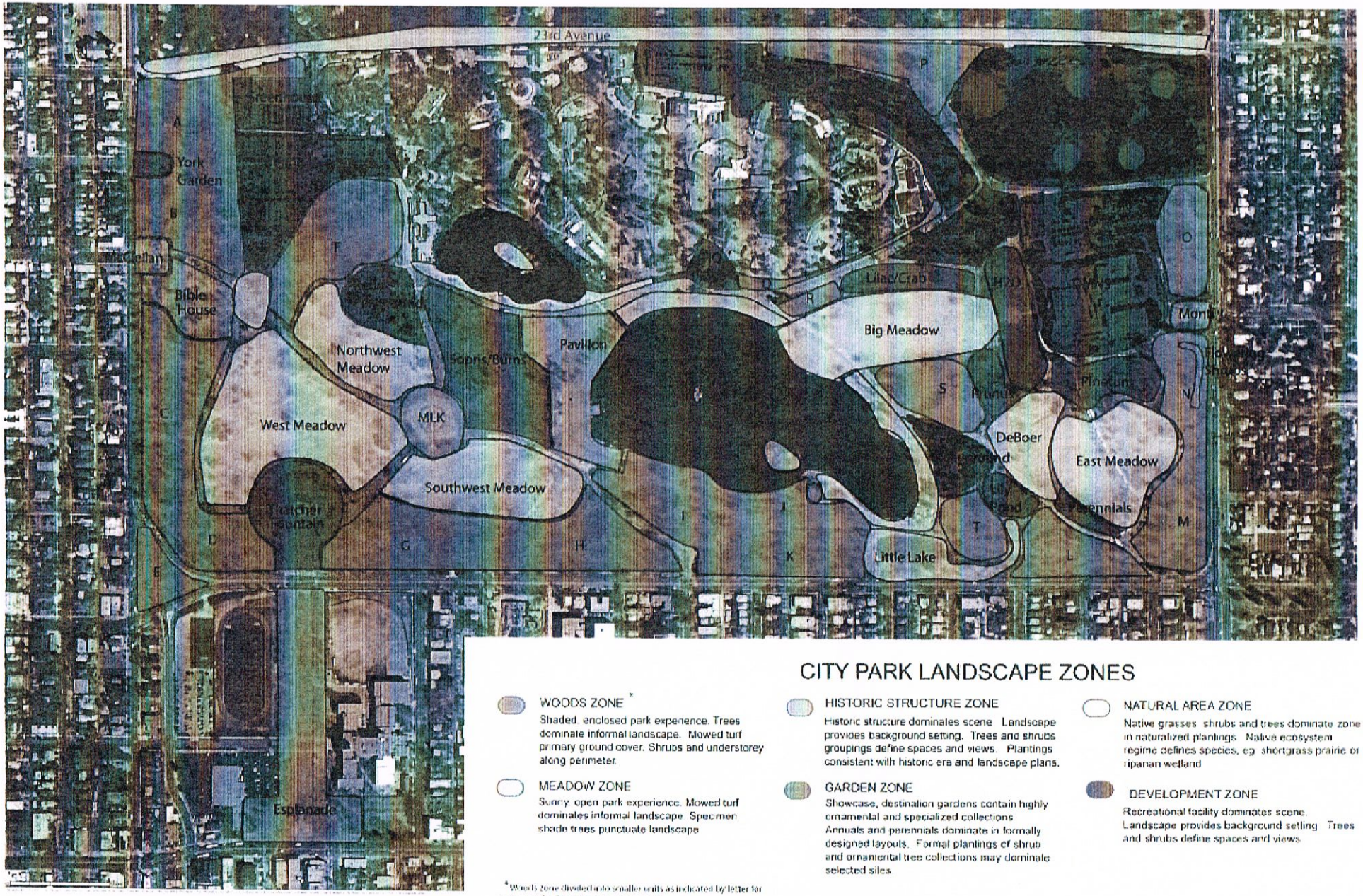
structure such as a fountain, building or other man-made structure. The landscape provides the background setting and should not dominate the scene. Tree and shrub groupings should function to define spaces and views. Plantings should be consistent with the historic era and historic landscape plans if available.

Garden Zone

This zone includes showcase, destination gardens that contain highly ornamental and specialized plant collections. Formal plantings of shrub and ornamental tree collections, such as the Crabapple Collection, dominate in specifically designed layouts. Plantings should be consistent with the historic era or historic landscape plans if available. Defined paths and adjunct structures should be subordinate to the landscaped scenery. Perennials, annuals and other plantings may dominate selected sites.

Natural Area Zone

A natural appearing environment defines the park character of this zone. Native grasses, shrubs and trees in informal, naturalized plantings dominate this zone. Where possible a native ecosystem regime should define the species selection and planting patterns such as a shortgrass prairie or riparian



CITY PARK LANDSCAPE ZONES

WOODS ZONE *

Shaded, enclosed park experience. Trees dominate informal landscape. Mowed turf primary ground cover. Shrubs and understorey along perimeter.

MEADOW ZONE

Sunny, open park experience. Mowed turf dominates informal landscape. Specimen shade trees punctuate landscape.

HISTORIC STRUCTURE ZONE

Historic structure dominates scene. Landscape provides background setting. Trees and shrubs groupings define spaces and views. Plantings consistent with historic era and landscape plans.

GARDEN ZONE

Showcase, destination gardens contain highly ornamental and specialized collections. Annuals and perennials dominate in formally designed layouts. Formal plantings of shrub and ornamental tree collections may dominate selected sites.

NATURAL AREA ZONE

Native grasses, shrubs and trees dominate zone in naturalized plantings. Native ecosystem regime defines species, eg. shortgrass prairie or riparian wetland.

DEVELOPMENT ZONE

Recreational facility dominates scene. Landscape provides background setting. Trees and shrubs define spaces and views.

* Woods zone divided into smaller units as indicated by letter for site specific, detailed plans in the future.

wetland. A natural appearance suitable for low to moderate recreational uses defines the character of this zone. Xeric, no mow grasses can also be employed where use is expected to be moderate and native species unsuitable. Drought tolerant trees and shrubs such as cottonwoods, gambel oaks, alders, ponderosa pines and junipers, define spaces and provide shade for recreational activities.

Development Zone

Recreational facilities dominate the uses and character of this zone. The landscape provides a suitable background setting for buildings and or structures. Trees and shrubs define spaces, frame views and provide shade.

Master Plan Concept

This master plan conceptually guides future improvements and is described and illustrated in the following discussion. Adding new tree plantings, creating new tree collections, enhancing existing collections and developing a variety of educational displays linked by an educational walk are intended to blend seemlessly with the existing park while also creating new recreational opportunities. The master plan components are the basic building blocks of the arboretum and can be implemented in phases and adapted according to funding availability.

New Tree Plantings

Planting new trees is vital to replenishing the tree canopy in the park and can be strategically undertaken to develop the arboretum concept. The tree planting strategy will focus on several arboretum objectives:

- Maintain and restore historic tree planting patterns as prescribed by relevant landscape zones
- Showcase recommended tree species for Denver, including the Denver Forestry list of suitable street trees (*Appendix C*)
- Increase the diversity of tree species in the park, not only for educational purposes but also to improve the aesthetics and long-term viability of the tree groves
- Promote sustainable practices by planting drought tolerant tree species, long-lived trees, and those species that are particularly well adapted to the region
- Promote a healthy environment by planting species that are especially good for cooling shade, carbon sequestration, pollution reduction, noise abatement, wind control and animal habitat

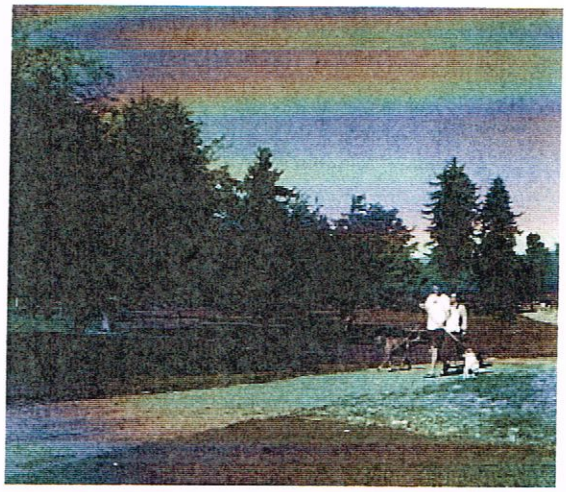
Due to the aging of the park's trees and on-going losses of the tree canopy it is critical that new tree plantings continue in the park to replenish and renew the landscape. Based on the analysis of existing park trees, nearly 1/3 of the park's trees nearing the end of the expected lifespan and 50% are in fair to poor condition. In addition, it is probable that recent losses have not been replaced at the same rate due to recent drought and extensive construction disruptions. Tree replacement is an urgent priority

to maintain the current tree canopy for the future.

To help guide the tree species selection for tree planting efforts, a list of recommended trees is included in this plan in *Appendix C*. The list was compiled using information from Denver forestry staff, Colorado State Cooperative Extension Service and Denver Park's publications. The trees included on the list have been researched and evaluated by experts in the field and proven to be most adaptable to the Denver region. The public will benefit from seeing such trees species first hand in a landscape setting in the arboretum.

The recommended tree list should help guide future tree plantings. Other species might also be considered if the selection meets the objectives of the arboretum. Priority should be given to establishing trees most suitable to the region.

New tree plantings events have always been a part of the park's activities and these should continue and be augmented whenever feasible. The new tree plantings will help demonstrate proper tree planting care and stewardship to further educate the public.



Crabapple Collection in City Park

Plant Collections

Most arboretums are organized by genera or specific species groups. However in the case of City Park, extensive plantings are already in place without systematic categorization. The park's trees consist of the general tree canopy and existing collections. Consequently, the arboretum will focus on adding new trees to replenish the general canopy with diverse and desirable species representative of Denver's urban forest. The existing collections will be rehabilitated and expanded to maximize their potential. Several existing shrub collections are included in this report since they are well established and can be readily developed to contribute to the arboretum.

Several new collections will be established to provide additional educational opportunities and complement specific park development areas. New shrub collections should be considered after further shrub inventories and evaluations are conducted. Other areas in the park such as the lily pond, rose garden and other flower beds that contribute to the botanical interest of the arboretum should also be addressed in separate planning efforts to enhance their contributions to the arboretum development.

Crabapple Collection

The existing crabapple collection was established in the early 1950's when S.R. DeBoer donated his private collection of crabapple trees to the park's fledgling botanical gardens. In 1956, 28 varieties were reported in the park (See *Appendix E*). Today, thirty crabapples are located in the area and none have been accurately classified by species and or cultivar. Further research, in consultation with an expert in crabapple species, is needed to investigate the historic plantings and compare with the existing tree species. An inventory and evaluation is needed to replace any missing trees and new cultivars should be added that represent a diversity of the species qualities, such as flower color and timing,

fall color, drought tolerance and fruiting types. A collection identification sign, tree labels, map and interpretive displays are recommended to educate visitors about the collection.

Lilac Collection

Over 40 individual lilac specimens were donated to the original Denver Botanical Garden and planted in the current location in 1953. An original plan and location of each shrub is available and should be used to inventory and evaluate the current collection (See *Appendix F*).

Most of the cultivars represented in the collection are French Lemoine hybrids which include many large double flowering varieties and interesting blue flowering forms not commonly seen in the region. Havemeyer, Clarke, Morel, Dunbar and Baltet introductions are also represented. Several lilac cultivars of the collection may be rare or difficult to replace from commercial nurseries. Special management attention for these specimens should include propagating from the park's stock or finding sources from other botanical collections.

Missing lilacs should be replaced and new varieties added to enhance the collection. The Lemoine cultivars have been improved upon in recent years with newer varieties that could be added to the collection to emphasize the hybrid's legacy. Other varieties suitable for the region should be added to diversify the collection and demonstrate the variations of flower color, timing, hardiness, drought tolerance and fall color. A collection identification sign and interpretive information should be developed to improve access and awareness of the collection's values and unique specimens.

Prunus Collection

A 1958 map of the plum and cherry tree collection documents 32 varieties of prunus species planted in the area (See *Appendix G*). Many of these have been lost, however an inventory and evaluation should be conducted to determine the current status of the area compared to the original planting plan. This area would benefit from a focused effort to replenish the collection. Future cherry tree plantings in the park should be focused on this area. A collection identification sign, tree labels and interpretive displays are recommended in the future to educate visitors about the collection as it develops.

Pinetum

A hilly labyrinth of junipers form the centerpiece of the pinetum located south of the Denver Museum of Nature and Science. Many pines and spruces were also planted in the vicinity and collectively these plantings comprise the pinetum. The juniper collection was developed in 1957 and an existing plan documents the location and varieties of 44 specimens planted in the area (See *Appendix H*). Each plant was a unique species or cultivar. An inventory and evaluation of the existing collection should be undertaken to replace missing specimens. New plantings should augment the juniper collection including new varieties and different forms and colors that are now available in the trade. A trail, collection identification sign and tree labels should be added to enhance the area.

This site is a favorite location for school groups to congregate after field trips to the museum. Consequently, interpretive exhibits geared to youth would be especially appropriate here. Picnic tables and benches might be incorporated into the area to support tree eductional programs for youth and adults.

Flowering Shrub Collection

In 2006, a large existing shrub bed was expanded and enhanced with new shrubs showcasing flowering species and four season interest. This bed, located adjacent to Colorado Boulevard, offers an easily viewed display not only for pedestrians but

also for the many drivers passing the park everyday. The bed is mostly completed however additional small trees and evergreens could be added to provide an improved backdrop for the display. A collection sign and plant labels should be added on representative species to complete the area.

Urban Forest Trees

City Park is one of the best sites in Denver where residents can see representative examples of the tree species that make up Denver's urban forest. Most of the trees that comprise the city's tree canopy were intentionally planted ornamental varieties. Very few trees, especially in the local neighborhoods, were established as natives growing spontaneously or as naturally occuring groves. Helping people understand their role in creating and maintaining the urban forest of Denver is the main thrust of the Urban Forest Tree Collection. The park's trees will be managed to demonstrate trees suitable for the region and help residents understand, appreciate and help maintain the urban forest trees of Denver. The many park roads and trails offer ideal access to observe and study the trees. Adding new trees from the recommended species list (See *Appendix C*) along the along park walks and roads will expand the collection. Species especially recommended for

Ferril Lake in City Park

street tree planting can also be highlighted in the collection. Efforts should be made to plant some of the new trees near older trees of the same species to help residents understand the growth rates of different trees and stagger tree age diversity.

Because the different tree species are widely dispersed throughout the park, a map of selected specimens along the Mile High Loop and other key interpretive sites will be developed to guide visitors through the tree collection. Educational programs and resources will be developed to promote information about about trees recommended for Denver. Initial actions can begin almost immediately without extensive or lengthy development to establish the tree collection. Installing tree labels on select trees to represent the species characteristics can be easily and inexpensively undertaken.

Educational materials should be developed for distribution at the arboretum trailheads, park offices, park rangers, the Denver Museum of Nature and Science, the Denver Zoo and online. Interpretive signs about street tree species attributes, environmental benefits, how to care for trees, and other pertinent information should also be developed to enhance the educational uses of the collection. Tree walks and tours should be incorporated with an emphasis on the values of the urban forest.

Cottonwood Groves

The west side of City Park contains a large number of mature and historic cottonwood groves. It is believed this area was the one of the first locations to be planted at the beginning of the park's historical development and some of these trees may date from the earliest periods of the park. The historic trees in this area should be preserved for as long as possible and removal should be a last resort. An evaluation of the older trees should be undertaken to determine tree ages, condition and historical period. If possible, the oldest tree in the park should be located and marked. In addition, treatment plans should be developed to preserve individual specimens in the historic groves. The cottonwood collection also lends itself to interpreting the history of tree planting in the park.

The groves should be augmented with additional cottonwood species not already present in the park. A collection sign and tree labels should be added to complete the area.

Colorado Natives

The DeBoer Waterway was created in 1957 to represent a Colorado mountain canyon and stream. Originally, this area recreated alpine and riparian environments with native mountain species. However soon after being planted with delicate collections of columbine, ferns and other alpine wildflowers, the area was damaged by heavy park uses especially from children who were drawn to play among the boulders and waterfalls. The area never recovered and languished for decades.

Recently efforts have been made to restore the area. New improvements to the waterway create opportunities to refurbish the surroundings into a more durable and sustainable native landscape appropriate to the Denver area. The site will be developed into a native prairie and riparian landscape to establish a Colorado Natives collection in the park. As an ecosystem-based planting, the collection will create a meaningful educational resource to demonstrate plant diversity, drought tolerance, water conservation, and maintenance needs of native landscaping. The juxtaposition of the prairie landscape surrounded by the intensively irrigated bluegrass landscape of the park will offer a glimpse into how the original prairies of the Denver area have been dramatically modified over the past 100 years. The unique beauty of a drought tolerant indigenous landscape will inspire greater appreciation and awareness of the water conservation issues relevant to current landscaping trends. Plant selection in this area should

be rigorously focused on native species that relate to the prairie and riparian landscape. Trees such as gambel oaks, alders, cottonwoods and juniper species would be appropriate in the area. Trails, site identication sign, plant identification labels, educational displays, water conservation programs will enhance the value of the collection.

Duck Lake Natural Area and Bird Habitat

Duck Lake has become an important refuge and nesting area for several bird species. Built in 1887, it has had a long history as a birding ground. The lake features an island with mature cottonwoods that is home for an important black-crowned night heron population. Duck Lake was not formally designed as a natural area, but it evolved as birds began to adopt the shallow water edges and adjoining trees for habitat. In the 1980's formal walkways and edge treatments were developed to improve access and prevent erosion. However, the concrete walkways and edge treatments have become undermined and damaged by saturated soils and foundation failure. The need for repair in the area creates a new opportunity to develop Duck Lake as a natural pond with wetland vegetation to showcase the habitat values of the area. Duck Lake will be rehabilitated featuring naturalized shorelines, wetland plantings and restored island. Plant species for this area should be selected to demonstrate the natural habitat of ponds that are home to a variety of waterfowl, fish, reptiles and small mammals. Shoreline vegetation will also be selected to protect edges from erosion. Cottonwoods, willows, alders, birches and other similar wetland species would be appropriate to add to the site.

Enhancing awareness about the habitat values will help ensure this unique area of the park will be sustained and appreciated for the long-term future. Bird habitat, shoreline restoration and beneficial wetlands should be incorporated to demonstrate the trees and shrubs in their native environment and interpret the ecological relationships for visitor education. Ranger programs, interpretive signs, plant labels, walkways, benches and other amenities should be developed to further support the educational opportunities of this site.

Little Lake Wetland Area

Little Lake was the original Lily Pond for City Park in 1912. Water loving plants have had a long association with this site and the pond improvements should continue this tradition by incorporating marginal wetlands species along the shoreline. Willows, alders, birches and other similar wetland species would be appropriate selections to create a suitable environment for the pond. Adding a weeping willow at the west end of the pond and careful siting of small trees and shrubs would help re-establish the historic views of the landscape. An interpretive sign with photos of the original pond and its history should be incorporated along the park trail near the pond. A collection sign and tree labels should be added to complete the area.

Residential Landscape Demonstration Area

The Graham-Bible House offers an ideal location to develop a typical residential setting where appropriate woody landscape species can be arranged as an interpretive home landscape design. Trees, shrubs, vines, flowers and other plants could be designed as a demonstration garden to illustrate the value of trees to the home landscape and provide advice for plant selection appropriate for the typical residential lot. Educational programs such as tree pruning, planting and care could be provided at the site. The Graham-Bible House can provide a classroom setting where visitors can participate in formal instruction on various tree related subjects. Trees and shrubs can be planted in specific areas to create staging areas for group activities and demonstrations. Interpretive signs, benches and residential

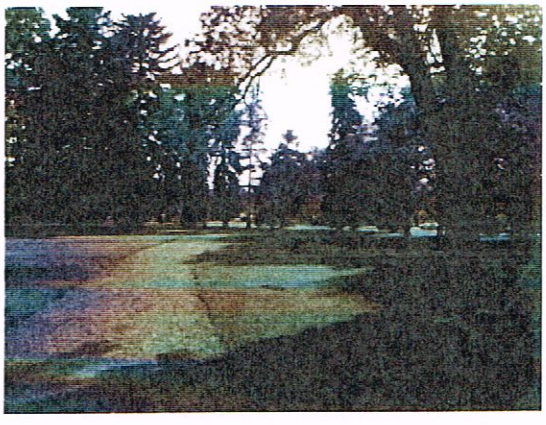
scale site furniture should be incorporated into the site design. Moveable seating that can be used for outdoor public programs in a variety of settings for demonstrations, guest lectures and other presentations should be acquired. A collection sign and tree labels should be added to complete the area.

Ancient Plants Collection

The proximity of the Museum of Nature and Science is an excellent opportunity to develop an exterior plant collection complementary to the interior exhibits of the museum. The dramatic dinosaur sculpture near the museum entrance and parking lot is a fitting site to develop an unusual and creative landscape that helps display the statue's presence. An ancient plant collection featuring "living fossil" plants is a suitable theme for a new plant collection in the park. Trees such as gingko, magnolia and dawn redwood along with other plants such as ferns and equisetum could be established as a new landscape near the museum. A plan should be developed in collaboration with plant and museum experts to select the appropriate species and thematic displays.

Mile High Loop Tree Walk

The existing Mile High Loop trail offers an excellent organizing structure to create the main pedestrian route linking tree specimens and plant collections for interpretation. Establishing a primary route helps simplify the circulation to access the plant collections and points of interest along the path. A tree walk brochure will be developed and selected specimens will be labeled along the route to interpret the diverse range of tree species of the Urban Forest Tree Collection. Unique and special specimens are easily reached from the trail. The trail is handicapped accessible and has easy connections to the surrounding neighborhoods and other park amenities.



Interpretive displays should be located along the route for orientation and directional purposes. Arboretum educational themes and related points of interest should also be incorporated into the interpretive displays to help visitors understand and appreciate the park's attractions. A trailhead kiosk is planned near the Denver Museum of Nature and Science and parking area to provide orientation and an overview of the park's arboretum attractions. New park restrooms and future picnic facilities will be nearby to provide additional visitor amenities.

Outdoor Educational Displays

Developing and installing informative, consistent and durable outdoor displays will be a fundamental component of the arboretum development. The displays including tree labels and interpretive signs should complement the trail system, maps and other educational materials. The following are the key recommendations for the park tree labels:

Tree Labels

Label a diverse range of tree species along the Mile High Loop route. Labled trees should be selected based on the following criteria:

- Excellent form and condition to demonstrate the typical species characteristics

- Good views and setting to appreciate tree characteristics
- Representive of urban forest tree species, rare species or unique tree values
- All trees that relate to a site specific collection should be labeled.
- Notable trees near trailheads and interpretive sites should be labeled

Labels designed for use on trees should be attached to trees with care and replaced quickly if damaged or stolen. Each label should include common name, latin name, cultivar if appropriate and native origin.

Interpretive Displays

Interpetive displays play a vital role for educating the public about the arboretum. A distinctive design standard should be developed to distinguish the arboretum educational themes from other park educational themes. The new design should have a consistent background, layout and color scheme to easily distinguish arboretum related messages.

The trailhead, with orientation and general information about the City Park Arboretum, should be established at an accessible and highly visible location. Trailhead information should include overall orientation and general tree themes.

Arboretum interpretive panels should present specific thematic educational information. Interpretive displays should be developed along the Mile High Loop route and at special collection sites. Potential general themes include: Denver's Recommended Trees; Denver Botanic Garden History; First Trees in City Park and Environmental Benefits of Trees.

The Dustin Redd Playground is an ideal location to develop youth oriented displays that can be integrated into the playground area. Future renovations can be designed to incorporate new structures that relate to the arboretum themes. A "treehouse" structure could be developed with ramps and steps that create elevated platforms centered around an artificial tree trunk structure. The tree trunk can serve as the educational display structure incorporating models of bark, tree rings, insects, and other features designed into the surface.

Master Plan Elements

1 Residential Demonstration Landscape
The charming Queen Ann architecture of the Graham-Bible House is an ideal setting to establish a residential landscape where small trees, shrubs, vines and flowers will be designed as a demonstration garden. The main house or the carriage house interior and the exterior areas can be used to stage arboretum educational programs. An open lawn area will serve as the outdoor classroom where surrounding plantings can be used to demonstrate tree care techniques.

2 Cottonwood Grove
In 1886, cottonwoods, the first trees planted in City Park, were located in this area. From school children to mayors, each generation of Denver residents helped to plant trees in the park. Magnificent specimens of historic cottonwoods are still preserved here in a large shady grove. New trees representing the wide diversity of the genus will be added to expand the area and further develop the botanical interest of the existing collection.

3 Urban Forest Trees & Mile High Tree Walk
City Park's Mile High Trail is an ideal showcase for the tree species that make up Denver's urban forest. The 3.1 mile trail will lead visitors through the park's vast tree collection to see examples of the wide range of species that make up the Denver urban forest. Selected specimens will be labeled to educate visitors about tree species suitable to Denver and trees especially recommended for street tree plantings. The trail also connects unique plant collections and scenic gardens to offer a comprehensive overview of the arboretum's attractions. Tree species not currently found in the park will be added near the trail to augment the collection and in other areas of the park to replace missing trees. Interpretive displays will be strategically located along the route.

4 Tree House Interpretive Exhibit
The Dustin Redd Playground is an ideal location to develop a youth-oriented display that can be integrated into the playground area. A "tree house" structure designed around a life-size model of a tree trunk will display tree facts visually such as bark components, branching structure, tree rings, insects, and other features on the tree trunk surface. Ramps and platforms will be developed to provide access to the various levels and interpretive displays.

5 Duck Lake Natural Area and Bird Habitat
Built in 1887, this area has a long history as a birding ground. The trees at the lake are home to an important black-crowned night heron population. Duck Lake will be rehabilitated featuring naturalized shorelines, wetland plantings, and a restored island to improve the habitat values of the site. Ranger programs, interpretive signs and other site amenities will also be added.

6 Little Lake Wetlands Area
Historic photos of this pond showed an idyllic scene of lush landscaping, romantic water lilies and weeping willows in the distance. These historic views will be the inspiration to recreate a naturalistic wetland landscape in this area incorporating species such as willows, alders, birches and other wetland species. An interpretive sign with the historic photos will be added to illustrate the story of its past

7 Prunus Collection
A 1958 map of the plum and cherry tree collection documented 32 varieties of prunus species planted in the area as part of the original Denver Botanic Garden development. Unfortunately most of these trees have been lost and a renewed focus to restore the collection will be needed. Plantings of specimen quality cherry trees in the park will be focused here.

8 Lilac Collection
One of the original collections developed during the Botanic Garden period, the lilac collection included over 40 different varieties of mostly french lilacs. Many of the original plantings still remain and not commonly seen in the region. This rare and important collection will be restored and rejuvenated. New cultivars of the french varieties will be added to expand the traditional lilac collection. New paths, interpretive signs and benches will be added to enhance the site.

9 Crabapple Collection
S.R. DeBoer donated his private collection of crabapple trees to the park's botanical gardens in the early 1950s. Many of the original trees still remain and will be preserved. New trees will be added to restore and expand the collection to represent a diversity of the species qualities, such as flower color and timing, fall color, drought tolerance and fruiting types.

10 DeBoer Natural Area
A four-acre native prairie and riparian landscape will establish a Colorado Natives collection in the park. The juxtaposition of the prairie landscape surrounded by the intensively irrigated bluegrass landscape of the park will offer visitors a glimpse into the past when the original prairies dominated the Denver area and how they have been dramatically modified over the years. Trails, benches, and interpretive signs will beincorporated to help visitors gain a deeper understanding and appreciation of native landscapes.

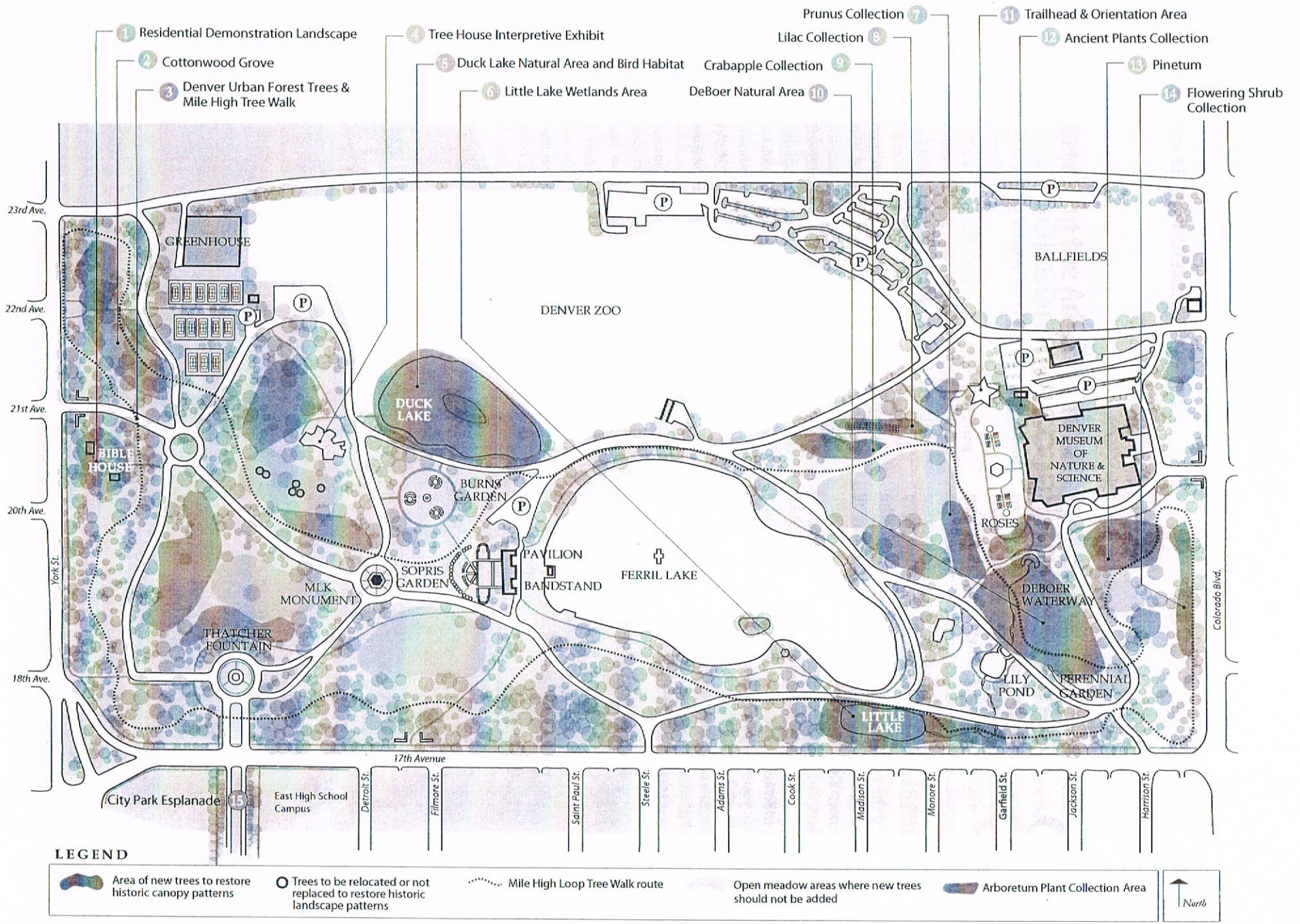
11 Trailhead & Orientation Area
A trailhead will be located near the restroom and parking areas to provide orientation and an overview of the park's arboretum attractions. A shade structure displaying maps and supporting graphics will be developed in this area along with seating and other amenties.

12 Ancient Plants Collection
An ancient plant collection featuring "living fossil" plants will be developed near the dinosaur sculpture. Trees such as gingko, magnolia and dawn redwood along with other plants such as ferns and equisetum will be established as an exterior exhibit. Museum staff will collaborate in the design of the area.

13 Pinetum
The labyrinth of junipers and evergreens was originally planted in the 1950s as part of the original Denver Botanic Garden development. The site will be restored to rejuvenate the collection. Missing species will be replaced and new juniper and evergreen species added to complement the range of species on display. A trail, interpretive signs, picnic tables and benches will be added to accommodate the large number of school groups that use the area.

14 Flowering Shrub Collection
A severely deteriorated shrub bed was enhanced and expanded in 2006 to showcase flowering shrub species. This area will continue to display flowering shrubs that provide color and interest year round. Additional ornamental trees and evergreens will be added to improve the surrounding setting and provide a colorful display along Colorado Boulevard.

15 City Park Esplanade
The City Park Esplanade borders the East High School campus where a community-led arboretum effort is underway. Together the entire area is home to over 280 trees including several notable specimens and champion trees. The joined grounds create a natural partnership opportunity to share educational programs, distribute public information and pursue grants to support both arboretum efforts.



CITY PARK ARBORETUM MASTER PLAN

Denver Parks and Recreation

3 Management Recommendations

Formal Recognition

One of the most important steps to establish City Park as an arboretum is to formally recognize its existence. There is no official certifying body for arboreta, but many institutions regard membership in American Public Garden Association (APGA) as an indication that an institution is an arboretum and not just using the name. In general, APGA members maintain plant records, label their plant collections, function as an aesthetic display, educational display, or research institution, are open to the public at least on a part-time basis, and have professional staff. APGA participation would be the best means to formally establish City Park as an arboretum and make it part of a larger arboretum support community. City Park would also gain listing in a national database which would promote awareness about the site nationwide. Membership requires filing a member application and annual dues to participate in the APGA listings. Dues are based on an operating budget for the institution.

Additional information about the APGA can be found online at: http://www.publicgardens.org/

Spring in City Park

Overseeing the Arboretum

The responsibilities to administer the arboretum will be shared among Denver Parks and Recreation staff as follows:

Park Planning Staff: Ensure tree planting efforts are consistent with park master plan, park improvements and construction projects; coordinate site improvements, interpretive sign design and installation; select tree species and planting locations in consultation with forestry staff; coordinate with parks maintenance regarding tree locations, timing and follow up care.

Forestry Staff: Plant tree replacements in consultation with park planner and parks maintenance; initiate tree maintenance after planting to establish new trees; monitor tree condition; perform regular and periodic inventories; pruning and tree removals; track and record tree removals; develop and implement disease prevention programs; install and maintain tree labels; and, establish policies for tree care and management.

Parks Maintenance Staff: Ensure new tree plantings are appropriately located to avoid impacts with park infrastructure; maintain and adjust irrigation system to adequately water trees; and, install tree mulch rings.

Million Tree Program Staff: Help provide funding and coordinate educational features and programming.

Volunteer Coordinator: Coordinate volunteer tree planting projects; recruit volunteers to plant and maintain park trees; and, publicize volunteer opportunities to care for arboretum trees.

In the long-term future, staffing to manage the arboretum such as an on-site curator, arborist and other personnel should be added to further the arboretum development and planning.

Partnerships

Each step taken towards developing the arboretum will require additional funding, expertise and new constituencies. While many aspects of developing the arboretum can be undertaken as part of the parks on-going management and maintenance, some new responsibilities will need outside support. Working with other organizations is the best way to fulfill the complete spectrum of responsibilities for developing the arboretum.

The Denver Museum of Nature and Science is one of the park's most important partners. Located in the park, it has a vested interest in the care and development of the park. Some of the museum's programs and displays also directly relate to the natural history, scenic views and environment of the park. By strengthening the links between the internal and external educational themes, both the museum and the park will benefit from working together and provide stronger public assets. The museum staff also has the expertise to provide technical assistance in developing educational programs and displays. Areas of collaboration may include:

- Assist in developing plans for Ancient Plants Collection
- Promote the arboretum by distributing brochures and maps to its visitors
- Develop and host public education programs about the arboretum collections
- Develop youth programs, summer camps and other activities that incorporate the arboretum's attractions
- Provide technical support to develop interpretive displays and brochures
- Seek grants that support mutual objectives
- Assist in volunteer and fundraising development

The Denver Zoo shares responsibilities for develop-

ing and managing areas within the park and is another critical partner in developing the arboretum. Specifically, it shares the care and management of Duck Lake and has led in the planning to improve the area. The continuation of this partnership should be focused in several areas:

- Continue collaboration on planning improvements for the Duck Lake Natural Area and Bird Habitat and the sharing of development costs
- Provide technical expertise in habitat management
- Assist in developing interpretive public education programs especially around Duck Lake
- Assist in seeking grants and other private funding to support shared resources in the arboretum
- Promote arboretum by distributing brochures and maps to its visitors

The Denver Botanic Gardens has a historical link to City Park and is another ideal partner to assist in developing the arboretum. Its staff already frequently provides plant materials and its expertise on an informal basis. These ties can be formalized and strengthened in several areas of collaboration including:

- Utilize staff expertise to identify, evaluate and assess current plant collections
- Assist in obtaining difficult to find plant materials
- Provide technical support to develop arboretum collections, plant care, interpretive materials and displays
- Assist in developing public education programs
- Collaborate and seek grants that support mutual objectives
- Assist in volunteer and fundraising development

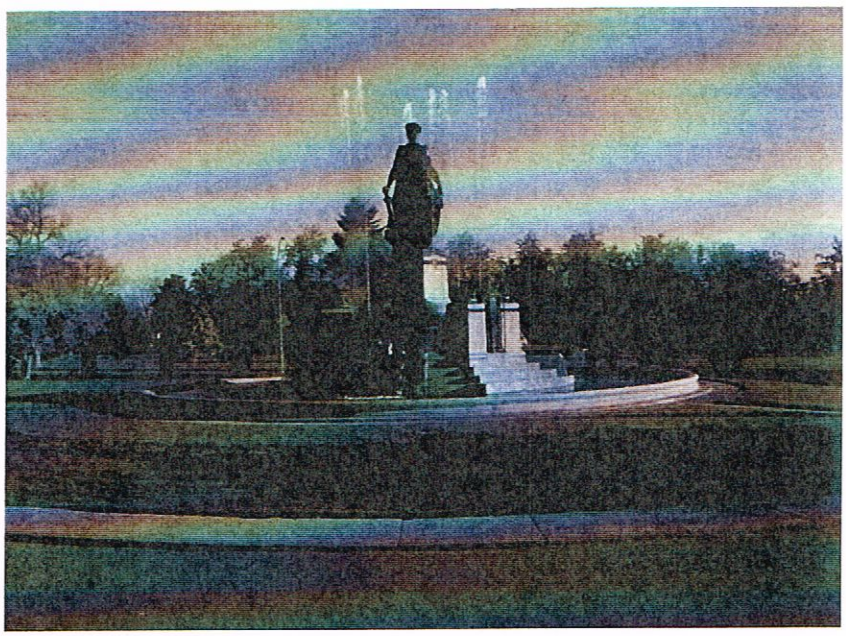
The City Park Alliance has a formal agreement to support improving and enhancing City Park through private fund-raising, newsletters and volunteering. Their support can be invaluable in developing new constituencies and building public awareness about the arboretum. Several partnership opportunities should be pursued with the Alliance including:

- Promote arboretum through their newsletters and website
- Develop and host public education programs about the arboretum collections such as regular walking tours, speaker programs and demonstrations
- Assist in funding plant materials, interpretive displays, park amenities and printing costs for maps and brochures
- Assist in seeking grants and other private funding to support the arboretum development
- Provide volunteers to assist, support and help maintain the arboretum

The Cooperative Extension Service provides an important resource for developing public awareness and education about gardening and environmental stewardship in the region. Its participants can be important resources to provide volunteers and expertise for public education programs. Park staff should collaborate with the extension staff to develop specific areas of support for the arboretum's objectives.

East High School is home to over 280 trees and the campus grounds are adjacent to the City Park Esplanade. The Esplanade area is owned and managed by Denver Parks and Recreation and yet serves as an important entry landscape for the Denver Public School. Efforts are underway among members of the East High community to improve tree health, enhance the seasonal beauty and promote the educational value of the campus and develop a school arboretum (See *Appendix I*). Several notable

specimens grow on the campus including champion larch, gingko, crabapple, horsechestnut and sycamore maple. The connected grounds of the school campus and the Esplanade creates a natural partnership opportunity to share educational programs, distribute public information and jointly pursue grants and other support resources. City forestry staff could assist in developing management practices to care for school trees and assist in tree pruning operations. East High School teachers could assist in developing age appropriate educational programs such as service learning projects, clubs and community service groups.



Crabapples blooming at Thatcher Fountain in City Park

4 CONCLUSION

The City Park Arboretum Master Plan establishes goals to improve City Park to create new opportunities for inspiration, learning and caring of park trees. The goals in turn establish a foundation for developing the arboretum into a sustainable community resource that can evolve for generations to come.

The Master Plan provides a roadmap for City staff, partner groups and the community to move forward together and work toward a common set of goals. As community interest and excitement grows, support for the arboretum will be strengthened and developed. And, once the momentum is underway, the City Park Arboretum can grow and flourish into a treasured city asset.

Joggers on the Mile High Loop in City Park

Making the Arboretum a Reality

The arboretum will take several years to fully realize. However, implementing early action steps can often generate momentum to fuel greater interest and support to the drive the effort forward faster. A phasing plan based on input from staff, partners, community and tree experts should be developed to establish annual work plans for implementation. Furthermore, it is important to revisit the plan annually to take stock in achievements and new information to refine goals and objectives and ensure the arboretum remains current in its service to the community.

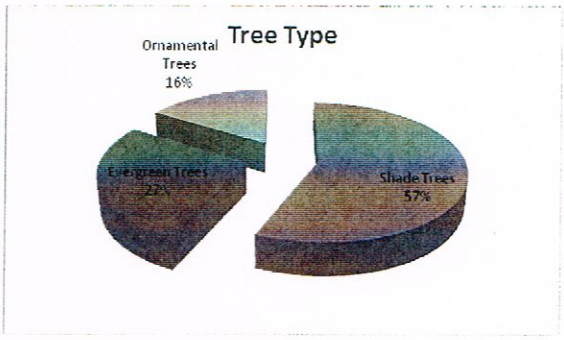
Early actions include:

- Select tree specimens for tree identification labels and create tree walk map for public distribution
- Officially request membership in the American Public Garden Association to formally recognize City Park as an arboretum
- Create arboretum sign design standards and install new interpretive signs
- Design and construct arboretum trailhead and amenities
- Plan and install annual tree plantings to replace missing trees, augment existing collections and establish new collections
- Establish funding mechanisms to employ arboretum staff to manage tree programs and implement capital improvements
- Update existing park tree inventory and reinventory on a regular basis every 5 years; engage academic faculty, students and community volunteers to assist in inventory process
- Inventory and analyze special collections including Pinetum, Crabapple, Lilac and Prunus collections using historic maps to develop new planting plans
- Create tracking records to monitor tree removals, pruning activities, tree health and other related maintenance matters
- Engage partners to develop plans and seek funding; jointly develop educational programs, community activities and volunteer events to promote and improve the arboretum
- Collaborate with Denver Museum of Nature and Science to develop plans for Ancient Plants Collection
- Work with Denver Zoo to develop plans for Duck Lake Natural Area and Bird Habitat

Appendix A:

Existing Tree Analysis

In 2005, park staff inventoried 3314 trees in City Park. An analyisis of the inventory was undertaken to analyze the strengths and weaknesses of the collection. Determining the level of diversity of the collection, tree health and potential risk factors were among the variables examined in the analysis. Tree age and historic patterns were also evaluated. The chart below illustrates the relative proportion of existing shade, evergreen and ornamental trees:



The top 20 most frequent trees are listed as follows:

Tree Type	Percent
Ash, Green	12%
Spruce, Colorado Blue	8%
Linden	6%
Elm	5%
Juniper	4%
Pine, Austrian	4%
Crabapple	4%
Honeylocust	4%
Pine, Ponderosa	3%
Hawthorn, Downy	3%
Maple, Silver	3%
Cottonwood	3%
Hackberry	3%
Oak, Bur	3%
Cherry	2%
Hawthorn, Cockspur	2%
Ash, Autumn Purple	2%
Fir, Douglas	2%
Plum	2%
Buckeye, Ohio	1%
Coffeetree, Kentucky	1%

Unique Trees

There are several unique tree specimens in City Park that include:

- Yellow Buckeye
- Dawn Redwood
- Bald Cypress
- Sawtooth Oak
- Corkscrew Willow
- Yellowhorn

The park is home to several specimen trees included on the State Champions List:

- Goldenrain Tree
- Upright Hornbeam
- Weeping Mulberry
- Jack Pine

Shade Tree Diversity

Shade trees are the dominant tree type in City Park and provide a great deal of species diversity in the park. The 55 different shade tree species include Ash, Catalpa, Kentucky Coffeetree, Oak, Maple, Elm, Cottonwood, Hackberry, Linden, Honeylocust, Ohio Buckeye and Sycamore. The range of species represents the trees most commonly planted in the Denver area and provides a solid foundation on which to develop the arboretum.

Green Ash was widely planted in the past due to its adaptability to the region. However, the species has become over-dominant in City Park. Steps have been taken by Denver Parks and Recreation to avoid planting this species not only in parks but also citywide.

Augmenting the range of species to further diversify the arboretum collection will enhance the interest and aesthetics of the park, improve the health of the canopy and further the educational objectives of the arboretum.

Evergreen Tree Diversity

Twenty-five different evergreen tree species were recorded in City Park. The 3 most common evergreen types are the Colorado Blue Spruce, Austrian Pine and Ponderosa Pine. These three species comprise 60% of all the evergreens in the park. While the Colorado Blue Spruce is the most common species of the evergreen population, the Juniper has the most variety of species within one evergreen genera.

The Colorado Blue Spruce is the most dominant evergreen in the park and represents 8% of all the trees in the park and nearly 40% of all the evergreens in the park. As the state tree, it is not surprising that the tree is so commonly planted. Many of the park's spruces are suffering the after affects of prolonged drought which may be causing the type of stress leading to Ips Beetle attacks. Several older spruce specimens have been recently removed as a result of beetle infestations. In light of theses problems, thoughtful consideration should be given when planning the future of the spruce collection.

The Pinetum Collection in City Park offers a unique range of evergreen species in Denver with particular emphasis on Junipers. While the 2005 inventory did not identify each species in the Juniper collection, historic plans indicate that approximately 90 different species were planted in 1956. It is not known how many of these still remain in the park today.

The evergreen tree collections should be built upon to replace missing species and additional species added to further diversify the parks trees.

Ornamental Tree Diversity

The ornamental trees in City Park include at least 33 different species. Many of the Crabapples, Cherry and Plum varieties were not well differentiated at the time of the 2005 inventory. It is highly

probable that there is significantly more diversity in the ornamental tree category than can be accurately documented at the time of this report. However, ornamental trees comprise less than 20% of the total tree population and consequently less well represented overall. Increasing the number of ornamental trees with additional species would help diversify the tree population in the park.

The Hawthorns and Crabapples are the most frequently planted ornamental trees in the park. The Hawthorn species as a group comprise 34% and Crabapple species as a group comprise 26% of all the ornamental trees. The Cherry tree species is also well represented comprising nearly 15% of the ornamental trees. The Downy Hawthorn is the most common ornamental tree and makes up nearly 1/5 of all the ornamental trees.

Crabapple and Prunus Collections were historically planted in the park as part of the Botanic Garden phase of the park. The Crabapple Collection in particular was notable at the time of its original planting in the 1950's and demonstrated a wide range of adaptable varieties of the period. However, it is not known how many of these original species remain in the park today. Further research is needed to evaluate these collections and develop tree replacement plans.

Age Analysis, Condition Assesment and Threats and Loss Risks

City Park has had annual tree plantings for over 100 years. The result is an extensive range of ages and tree sizes. The age of the trees has not been consistently recorded or monitored in the park consequently it is not known precisely how old the park's trees really are.

However, while actual tree ages are not available, measurements of the tree trunk diameter (DBH) can be used to suggest relative tree maturity. Based on these measurments, trees measuring 20-inches and greater represent the most mature trees in the park and make up 1/3 of all the tree totals. Given that the average life-expectancy of a tree is about 50 – 60 years, it could indicate that approximately 30% of the park's trees are entering the later stages of their lifespan.

The 2005 inventory also documented condition of the trees at the time. In this analysis, trees in good to excellent condition were compared to the trees in fair to poor condition. This data is fairly consistent with the adaptability of the species to the region. The healthiest trees included Catalpa, Cottonwood, Elm, Honeylocust, Linden, Hackberry, Green Ash, Autumn Purple Ash, Cockspur Hawthorn, Goldenrain Tree, Swamp White Oak, Kentucky Coffeetree, Japanese Pagoda Tree, Gingko, Bur Oak and English Oak. These trees are generally among the most adaptable trees in the region.

Of concern however is that over 50% of the park's trees were listed in Fair or Poor condition. This may be due to the extended drought conditions, reduced maintenance budgets and irrigation restrictions that could have led to more than usual stress on the trees. This factor may also indicate the need to increase maintenance capabilities, evaluate future tree planting choices and the need to replace a significant number of trees in the future to maintain current levels of tree canopy and historic planting patterns.

As mentioned earlier the Ips Beetle is currently adversely affecting the Colorado Blue Spruce tree population in the park. The potential future threat from the Emerald Ash Borer (EAB) is another source of concern that could pose a significant impact if the infestation develops in the Rocky Mountain Region. First spotted in 2002 near Detroit, Michigan, EAB has since spread into much of Michigan, Illinois, Indiana, Maryland, Ohio, and Pennsylvania decimating significant mature ash tree populations. It is possible that EAB could spread into the Rocky Mountain Region and adversely affect the extensive ash tree population in City Park.

Lessons learned during the Dutch Elm Beetle oubreaks underscores the need to diversify the tree species in the park. Increasing the number of different species grown together in one area helps to mitigate the negative impact of widespread losses of a single species due to spreading diseases.

The City Park irrigation system uses recycled water supplied by Denver Water from its wastewater treatment plant. The water, although treated to conform to standards set by the Colorado Department of Health and Environment, has higher levels of salt and nitrogen compounds than potable water. The long-term effects of recycled water on trees is not yet fully understood and studies should be conducted to evaluate the impacts

The park was impacted by major construction and disruptions in the irrigation system from 2005 to 2008. Consequently, tree replacement operations were slowed down and may not have kept up with the pace of losses.

Historic Tree Canopy Analysis

The pattern of tree groves and open meadows is the hallmark of the historic pastoral setting of the park. Maintaining these patterns is critical to preserving the historic values in the park. An analysis of historic patterns was conducted using the 1938 aerial photographic image. Current tree masses are thinner than historic patterns and should be augmented with new tree groupings to replenish the historic canopy. *See Map.*

Analysis Conclusions

- City Park contains a wide variety of tree species, several state champion listed trees, and a number of specialized collections suitable for developing an arboretum
- One half of the park's trees are in fair to poor condition indicating the need to improve maintenance capabilities especially during drought years
- Approximately 1/3 of the trees may need replacement in the near future due to health condition, construction impacts and natural decline due to age. Tree replacement should continue as a high priority in the park
- Increasing species diversity is needed to augment educational benefits, enhance park aesthetics and improve disease resistance
- Green Ash is heavily planted in the park and as individuals die, they should be replaced with alternate species
- Tree replacement strategies and tree species selection guidance of an arboretum plan is desriable to improve the long-term health and sustainability of the park's trees
- The affects of recycled water on tree health should be monitored over time to evaluate potential impacts
- The historic tree canopy pattern provides a framework for managing tree patterns in the future to preserve the historic landscape of the park

COST ESTIMATE

ITEM	QUANTITY	COST	IMPLEMENTATION	ANNUAL COSTS
Tree Planting	70 / year	$250	$17,500	$17,500
Tree Labels	100	$8	$800	$80
Graphic Design	1	$1200	$1200	0
Trailhead Kiosk	1	$10,000	$10,000	0
Collection Sign	10	$500	$5000	0
Interpretive Signs	5	$2000	$10,000	0
Trail Maps	1000 / year	$2	$2,000	$2,000
APGA Organizational Dues	1 / year	$500 (estimated)	$500	$500
Maintenance	3500 trees	$32*		$112,000
TOTAL			$47,000.00	$132,080.00

* Maintenance costs based on several reports on urban tree costs conducted by Western Center for Urban Forest Research and Education USDA Forest Service, Pacific Southwest and reported in:

McPherson, E. Greg, et al "Municipal Forest Benefits and Costs in Five US Cities", *Journal of Forestry*, December, 2005

Appendix C

TREE RECOMMENDATION LIST (Priority species highlighted)

Ref	Plant Name	Common Name	Existing Park Species	< 3 in Park	Recommended Street Tree	Drought Tolerant	Native	Tree Type	Growth Rate	Seasonal Interest
STR	Acer campestre	Hedge Maple	Yes	Yes	Yes	Yes		Small	Med	fc
CSU	Acer freemanii	Freeman Maple						Large	Med	fc
CSU	Acer ginnala	Ginnala Maple	Yes					Small	Med	fc
CSU	Acer glabrum	Rocky Mountain Maple			Yes			Small	Med	fc
CSU	Acer grandidentatum	Wasatch Maple			Yes	Yes	Yes	Small	Med	fc
STR	Acer griseum	Paperbark Maple			Yes			Small	Med	fc
STR	Acer miyabei	Miyabei Maple			Yes	Yes		Large	Med	fc
CSU	Acer negundo	Box-elder						Large	Fast	fc
CSU	Acer plantanoides	Norway Maple	Yes					Large	Med	fc
STR	Acer pseudoplatanus	Sycamore Maple			Yes			Large	Med	fc
CSU	Acer rubrum	Red Maple	Yes					Large	Fast	fc
CSU	Acer saccharinum	Silver Maple	Yes					Large	Fast	fc
CSU	Acer saccharum	Sugar Maple	Yes		Yes			Large	Slow	fc
CSU	Acer tatarian	Tatarian Maple			Yes	Yes		Small	Med	fc
STR	Aesculus flava	Yellow Buckeye			Yes			Large	Med	fc, sf
CSU	Aesculus glabra	Ohio buckeye	Yes		Yes			Large	Med	fc, sf
CSU	Aesculus hippocasanum	Horsechestnut	Yes		Yes			Large	Slow	sf
STR	Aesculus x carnea	Red Horsechestnut			Yes			Large	Med	sf
CSU	Aibes concolor	White Fir	Yes				Yes	Large	Slow	ev
CSU	Aibes lasiocarpa arizonica	Corkbark Fir					Yes	Large	Slow	ev
CSU	Alnus tenuifolia	Thinleaf Alder	Yes				Yes	Small	Med	fc
CSU	Amelanchier canadensis	Shadblow Serviceberry						Small	Med	fc, sf
CSU	Amelanchier x grandifolia	Autumn Brilliance				Yes		Small	Med	fc, sf
CSU	Amelanchier laevis	Allegheny Serviceberry						Small	Med	fc, sf
CSU	Betula occidentalis	Rocky Mountain Birch				Yes		Small	Med	fc

Appendix C

TREE RECOMMENDATION LIST (Priority species highlighted)

Ref	Plant Name	Common Name	Existing Park Species	< 3 in Park	Recommended Street Tree	Drought Tolerant	Native	Tree Type	Growth Rate	Seasonal Interest
STR	Betula nigra 'Heritage'	Heritage River Birch			Yes			Med	Fast	fc
CSU	Betula payrifera	Paper Birch						Large	Med	fc
CSU	Betula payrifera pendula 'Gracilis'	Weeping Birch						Large	Med	fc
STR	Carpinus betulus	European Hornbeam			Yes			Large	Med	
STR	Carpinus betulus 'Columnaris'	Columnar Hornbeam			Yes			Large	Med	fc
CSU	Carpinus betulus 'Fastigiata'	Fastigiate Hornbeam	Yes					Med	Med	
CSU	Carpinus caroliniana	Hornbeam	Yes		Yes			Small	Slow	fc
STR	Carya glabra	Pignut Hickory			Yes	Yes		Large	Med	fc
STR	Carya illinoinensis	Pecan			Yes	Yes		Large	Slow	fc
STR	Carya ovata	Shagbark Hickory			Yes	Yes		Large	Slow	fc
STR	Catalpa speciosa	Catalpa	Yes		Yes	Yes		Large	Fast	sf
DPR	Cedrus libani	Cedar of Lebanon						Large	Slow	ev
STR	Celtis laevigata	Sugar Hackberry	Yes	Yes	Yes			Large	Med	
STR	Celtis occidentalis	Hackberry	Yes		Yes	Yes		Large	Med	fc
STR	Celtis reticulata	Netleaf Hackberry			Yes	Yes		Small	Slow	
STR	Cercidiphyllum japonicum	Katsuratree	Yes	Yes	Yes			Large	Med	fc
CSU	Cercis canadensis	Redbud	Yes		Yes	Yes		Small	Med	sf
CSU	Cladrastris kentukea (lutea)	Yellowwood	Yes					Med	Med	fc. sf
STR	Corylus colurna	Turkish Filbert	Yes		Yes	Yes		Large	Med	fc
CSU	Crataegus ambigua	Russian Hawthorn			Yes	Yes		Small	Med	fc, sf
CSU	Crataegus crus-galli	Cockspur Hawthorn	Yes		Yes	Yes		Small	Med	fc. sf
CSU	Crataegus mollis	Downy Hawthorn	Yes					Small	Med	fc, sf
CSU	Crataegus phaenopyrum	Washington Hawthorn	Yes					Small	Med	fc, sf
CSU	Crataegus x mordenensis	Toba Hawthorn	Yes					Small	Med	sf
STR	Eucommia ulmoides	Hardy Rubber-tree			Yes			Large	Med	

Appendix C

TREE RECOMMENDATION LIST (Priority species highlighted)

Ref	Plant Name	Common Name	Existing Park Species	< 3 in Park	Recommended Street Tree	Drought Tolerant	Native	Tree Type	Growth Rate	Seasonal Interest
DPR	Fagus grandifolia	American Beech						Large	Med	fc
DPR	Fagus sylvatica	European Beech	Yes	Yes				Large	Med	fc
CSU	Fraxinus americana	Autumn Purple Ash	Yes					Large	Med	fc
STR	Fraxinus quadrangulata	Blue Ash				Yes		Large	Med	fc
CSU	Fraxinus mandshurica	Mandcana Ash						Large	Med	fc
CSU	Fraxinus pennsylvanica	Green Ash	Yes					Large	Med	fc
CSU	Fraxiunus nigra	Black Ash						Large	Med	fc
STR	Ginkgo biloba	Gingko	Yes		Yes			Large	Slow	fc
CSU	Gleditsia triancanthos inermis	Honeylocust	Yes		Yes	Yes		Large	Med	fc
CSU	Gymnocladus dioica	Kentucky Coffeetree	Yes		Yes	Yes		Large	Med	
STR	Juglans nigra	Black Walnut	Yes		Yes			Large	Med	
CSU	Juniperus spp	Juniper, various species	Yes			Yes		Small	Med	ev
DPR	Juniperus virginiana	Eastern Redcedar				Yes		Med	Slow	ev
CSU	Kolreuteria paniculata	Goldenrain Tree	Yes		Yes	Yes		Med	Med	fc, sf
CSU	Larix decidua	Larch	Yes					Large	Med	fc
STR	Liquidambar sytraciflua	Sweetgum			Yes			Large	Med	fc
STR	Liriodendron tulipifera	Tulip Tree	Yes		Yes			Large	Med	fc, sf
STR	Maackia amurensis	Amur Maackia			Yes			Small	Med	sf
DPR	Maclura pomifera 'Wichita'	Wichita Osage Orange				Yes		Large	Med	
DPR	Magnolia x soulangiana	Saucer Magnolia						Small	Med	sf
DPR	Magnolia stellata	Star Magnolia						Small	Med	sf
CSU	Malus spp	Apple, various species	Yes		Yes			Small	Med	sf

Appendix C

TREE RECOMMENDATION LIST (Priority species highlighted)

Ref	Plant Name	Common Name	Existing Park Species	< 3 in Park	Recommended Street Tree	Drought Tolerant	Native	Tree Type	Growth Rate	Seasonal Interest
DPR	Metasequoia glyptostroboides	Dawn Redwood	Yes					Large	Fast	ev
STR	Parrotia persica	Persian Ironwood			Yes	Yes		Small	Med	fc
CSU	Phellodendron amurense	Amur Corktree			Yes			Large	Med	fc
STR	Phellodendron lavellei 'Eyestopper'	Eyestopper Corktree			Yes	Yes		Med	Med	fc
CSU	Picea abies	Norway Spruce	Yes					Large	Med	ev
CSU	Picea engelmannii	Englemann Spruce	Yes				Yes	Large	Med	ev
CSU	Picea glauca	White Spruce						Large	Med	ev
CSU	Picea glauca var densata	Black Hills Spruce						Large	Slow	ev
DPR	Picea omorika	Serbian Spruce						Large	Slow	ev
CSU	Picea pungens	Colorado Blue Spruce	Yes				Yes	Large	Med	ev
CSU	Pinus aristata	Bristlecone Pine	Yes			Yes	Yes	Large	Slow	ev
CSU	Pinus contorta latifolia	Lodgepole Pine					Yes	Large	Med	ev
CSU	Pinus edulis	Pinyon Pine	Yes			Yes		Large	Med	ev
CSU	Pinus flexilis	Limber Pine	Yes				Yes	Large	Med	ev
DPR	Pinus jefferyi	Jeffrey Pine				Yes		Large	Med	ev
CSU	Pinus nigra	Austrian Pine	Yes					Large	Med	ev
CSU	Pinus ponderosa	Ponderosa Pine	Yes			Yes	Yes	Large	Med	ev
CSU	Pinus strobiformis	Southwestern White Pine	Yes				Yes	Large	Med	ev
CSU	Pinus strobus	Eastern White Pine	Yes					Large	Med	ev
CSU	Pinus sylvestris	Scotch Pine	Yes					Large	Med	ev
STR	Platanus occidentalis	Sycamore	Yes	Yes	Yes			Large	Med	
STR	Platanus x acerifolia	London Planetree			Yes			Large	Med	
CSU	Populus alba	Silver Poplar						Large	Fast	
CSU	Populus angustifolia	Narrowleaf Cottonwood					Yes	Large	Fast	fc
CSU	Populus deltoides	Siouxland Cottonwood						Large	Fast	

Appendix C

TREE RECOMMENDATION LIST (Priority species highlighted)

Ref	Plant Name	Common Name	Existing Park Species	< 3 in Park	Recommended Street Tree	Drought Tolerant	Native	Tree Type	Growth Rate	Seasonal Interest
CSU	Populus sargentii	Plains Cottonwood	Yes				Yes	Large	Fast	
CSU	Populus tremula erecta	Upright European Aspen						Small	Fast	fc
CSU	Populus tremuloides	Aspen					Yes	Small	Fast	fc
CSU	Populus x acuminata	Lanceleaf Cottonwood	Yes	Yes			Yes	Large	Fast	
CSU	Prunus cerasifera 'Newport'	Newport Plum	Yes		Yes			Small	Med	sf
CSU	Prunus maackii	Amur Chokecherry				Yes		Small	Med	sf
CSU	Prunus nigra 'Princess Kay'	Princess Kay Plum						Small	Med	fc, sf
CSU	Prunus padus	Mayday Tree			Yes			Small	Med	sf
STR	Prunus sargentii 'Columnaris'	Columnar Sargent Cherry			Yes			Med	Med	sf, fc
STR	Prunus serotina	Black Cherry			Yes			Large	Fast	fc, sf
CSU	Prunus virginiana 'Canada Red'	Canada Red chokecherry						Small	Fast	sf
CSU	Pseudotsuga menziesii	Douglas-fir	Yes			Yes	Yes	Large	Med	ev
CSU	Ptelea trifoliata	Wafer Ash						Small	Med	fc
CSU	Pyrus calleryana	Pear	Yes					Small	Med	fc, sf
CSU	Pyrus ussurienses	Prairie Gem Pear						Small	Med	fc, sf
STR	Quercus alba	White Oak			Yes			Large	Med	**fc**
CSU	Quercus bicolor	Swamp White Oak	Yes		Yes	Yes		Large	Med	fc
STR	Quercus buckleyi	Texas Red Oak			Yes	Yes		Large	Med	**fc**
CSU	Quercus gambelii	Gambel Oak				Yes		Small	Slow	fc
STR	Quercus imbricaria	Shingle Oak			Yes	Yes		Large	Slow	fc
STR	Quercus lyrata	Overcup Oak			Yes	Yes		Large	Med	
STR	Quercus x macdanielli 'Heritage'	Heritage Oak			Yes	Yes		Large	Med	
CSU	Quercus macrocarpa	Bur Oak	Yes			Yes		Large	slow	

Appendix C

TREE RECOMMENDATION LIST (Priority species highlighted)

Ref	Plant Name	Common Name	Existing Park Species	< 3 in Park	Recommended Street Tree	Drought Tolerant	Native	Tree Type	Growth Rate	Seasonal Interest
STR	Quercus x mazei	Colorado Foothills Oak			Yes	Yes		Large	Med	
STR	Quercus michauxii	Swamp Chestnut Oak			Yes	Yes		Large	Med	fc
STR	Quercus muehlenbergii	Chinkapin Oak			Yes	Yes		Large	Med	fc
	Quercus prinus	Chestnut Oak			Yes	Yes		Large	Med	
CSU	Quercus robur	English Oak	Yes		Yes	Yes		Large	Med	
CSU	Quercus rubra	Red Oak	Yes					Large	Med	fc
STR	Quercus shumardii	Shumard Oak			Yes			Large	Med	fc
DPR	Quercus undulata	Wavyleaf Oak				Yes		Small	Med	
STR	Quercus velutina	Black Oak			Yes	Yes		Large	Med	fc
STR	Quercus x warei 'Regal Prince'	Regal Prince oak			Yes	Yes		Large	Med	fc
CSU	Robinia psuedoacacia	Black Locust	Yes		Yes	Yes		Large	Fast	sf
CSU	Salix alba 'tristis'	Weeping Willow						Large	Fast	fc
CSU	Salix amygdaloides	Peachleaf Willow						Large	Fast	fc
DPR	Sequoiadendron giganteum 'Hazel Smith'	Hazel Smith Giant-sequoia				Yes		Large	Slow	ev
CSU	Sophora japonica	Japanese Pagodatree	Yes		Yes			Small	Med	sf
STR	Sorbus alnifolia	Korean Mountain-ash			Yes			Med	Med	sf
STR	Sorbus aria	Common Whitebeam			Yes			Med	Med	sf
CSU	Sorbus aucuparia	European Mountain Ash						Small	Med	fc, sf
STR	Sorbus hybrida	Hybrida Mountain Ash			Yes			Med	Med	sf
STR	Sorbus intermedia	Intermedia Mountain Ash			Yes			Med	Med	sf
STR	Syringa pekinensis	Chinese Tree Lilac			Yes			Small	Med	sf
CSU	Syringa reticulata	Japanese Tree Lilac	Yes		Yes			Small	Med	sf
DPR	Taxodium distichum	Baldcypress	Yes	Yes				Large	Med	fc
CSU	Tilia americana	Linden	Yes		Yes			Large	Med	fc, sf
CSU	Tilia cordata	Littleleaf Linden	Yes		Yes			Large	Med	fc, sf

Appendix C

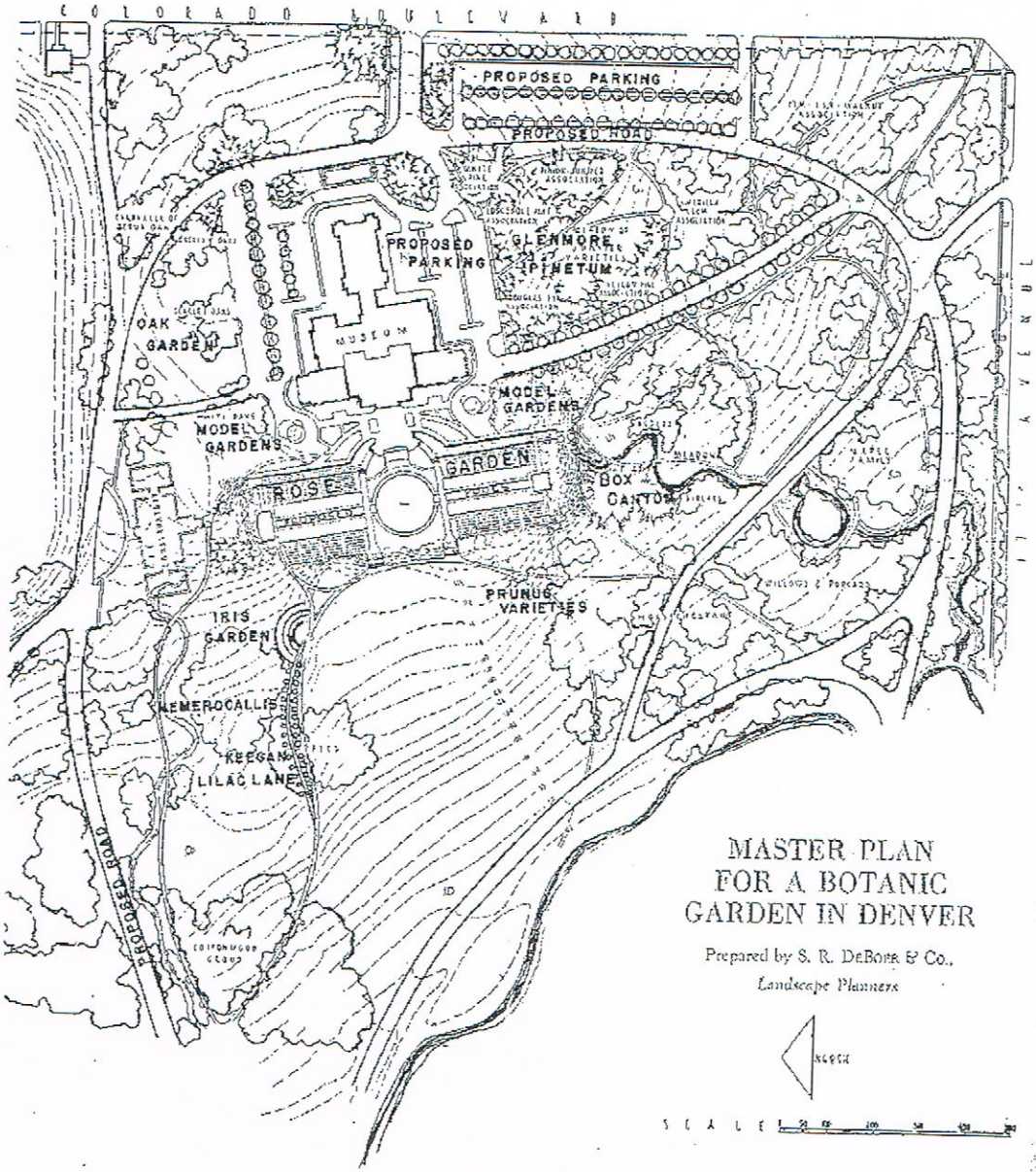
TREE RECOMMENDATION LIST (Priority species highlighted)

Ref	Plant Name	Common Name	Existing Park Species	< 3 in Park	Recommended Street Tree	Drought Tolerant	Native	Tree Type	Growth Rate	Seasonal Interest
STR	Tilia mongolica	Mongolian Linden			Yes			Large	Med	fc, sf
STR	Tilia tomentosa	Silver Linden			Yes			Large	Med	fc, sf
STR	Ulmus japonica	Japanese Elm			Yes	Yes		Med	Med	fc
STR	Ulmus parvifolia	Lacebark Elm			Yes			Large	Med	fc
STR	Ulmus x sp	Elm	Yes		Yes	Yes		Large	Med	fc
STR	Viburnum prunifolium	Blackhaw Viburnum			Yes	Yes		Small	Slow	sf
STR	Zelkovia serrata	Japanese Zelkova			Yes			Large	Med	fc
										fc= good fall color
										sf= showy flowers
										ev=evergreen

Several sources were used to develop the tree selection list:

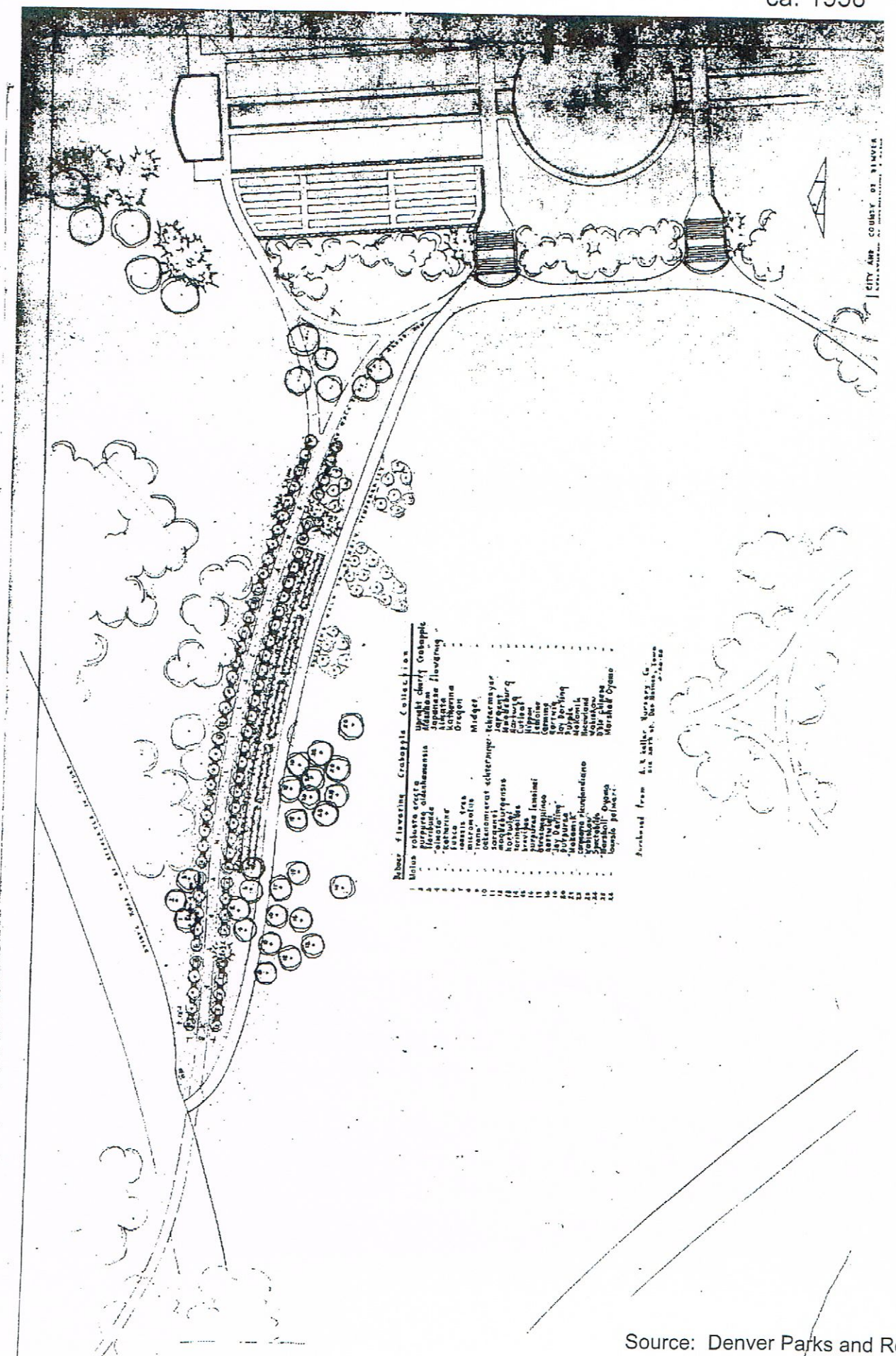
1. *Large Deciduous Trees* by J.E. Klett and C Wilson, Colorado State University Cooperative Extension Service #7.419 (CSU)
2. *Small Deciduous Trees* by J.E. Klett and C Wilson, Colorado State University Cooperative Extension Service #7.418 (CSU)
3. *Evergreen Trees* by R.A. Cox and J.E. Klett, Colorado State University Cooperative Extension Service #7.403 CSU)
4. Denver Parks and Recreation Recommended Street Tree List and staff recommentations (STR & DPR)
5. David Nowak, et al, *Effects of Urban Tree Management and Species Selection on Atmospheric Carbon Dioxide* , Journal of Arboriculture, 2002

Appendix D
Original Denver Botanic Garden Pl
ca. 1956



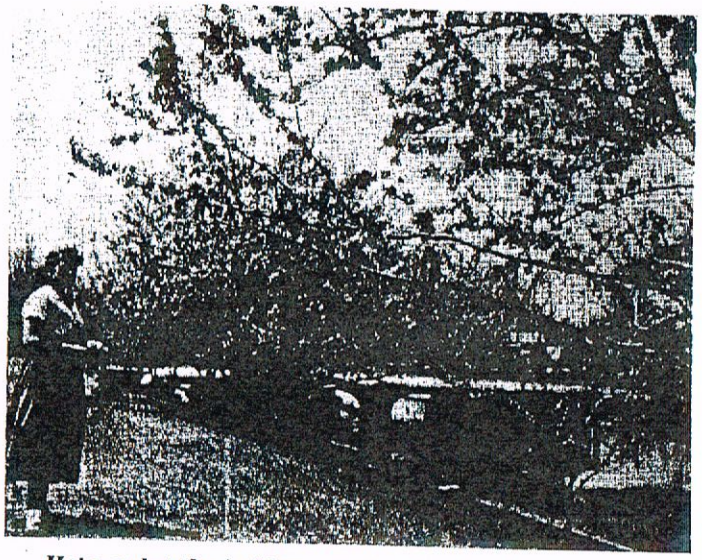
Source: Denver Parks and Recreation Files

Appendix E
Crabapple Collection Pla
ca. 1958



Source: Denver Parks and Recreation Files

home?" to go out to City Park, learn the name of desired trees from the labels upon them and inquire of the Director whether or not the trees selected have idiosyncrasies. At the same time the Botanical Gardens Foundation of Denver, Inc. will have created a beautiful and unique Denver area that our citizens can be proud of.



Hopa crabapples in bloom on the Speer Boulevard parkway

FLOWERING CRABAPPLES IN THE BOTANICAL GARDEN

By S. R. DEBOER

FOR you to fully understand the purpose behind the collection of trees of this kind in the Botanical Garden, I must tell you the background of the ornamental apple trees in the Denver region.

A few years ago, there were two red-flowering crabapples in Washington Park, and they were probably the only ones of this kind in the Denver region. They are still there and they became the incentive to try a larger planting of these red flowering apple varieties. Denver had had many common white flowering apples, but none of them were the red ones.

The Downing Street Parkway, from Cherry Creek to Bayaud Avenue, was planted with the Floribunda purpurea, one of the most attractive varieties at that time. They proved hardy, but after a couple of years they were damaged by being hit by hand mowers and by scale insects. In spite of that, they were such a success that there was a demand for a longer line of red flowering crabapples. The planting was continued along Cherry Creek, but in these plantings the Hopa Crabapple was used and, step by step, these trees were introduced along the Cherry Creek banks. The Bechtel Flowering Crab was planted on the Marion Street Parkway, on the entrance to Washington Park. Eventually, it was hoped to get a cross-town trail of red flowering apples. They were, also, planted in Berkeley and Rocky Mountain Lake Parks, but the line between these areas was not completed.

The planting by the City Parks was received with tremendous enthusiasm by the people of Denver, who ordered red flowering crabapples from the nurserymen by the hundreds. The thought of using these trees appealed to other cities and there was a period when the growers of the United States could not keep up with the demand for the Hopa flowering apple.

This is, perhaps, one of the most outstanding illustrations of what the Botanical planting may do for a city in assisting its people to plant unusual varieties. It was with this in mind that the Botanic Garden created a collection of flowering crabapple trees. The Botanic Garden, at present, has 28 varieties: namely, the following:

Malus cl. 'Almata Crabapple'
M. Cl. 'Dolgo'—Dolgo Crabapple
M. cl. 'Irene'—Irene Crabapple
M. cl. 'Jay Darling' — Jay Darling Crabapple
M. cl. 'Katherine' — Katherine Crabapple
M. cl. 'Kingsmere'—Kingsmere Crabapple
M. cl. 'Makamik'—Makamik Crabapple
M. cl. 'Marshall Oyama' — Marshall Oyama Crabapple
M. cl. 'Wabiskaw'—Wabiskaw Crabapple
M. adstringens cl. 'Hopa' — Hopa Crabapple
M. atrosanguinea — Carmine Crab. apple
M. brevipes — Nippon Crabapple
M. coronaria nieuwlandiana—Nieuwland Crabapple
M. floribunda — Japanese Flowering Crabapple
M. fusca — Oregon Crabapple
M. Hartwigii — Hartwig Crabapple
M. ioensis cl. 'Nova' — Nova Crabapple
M. ioensis Palmeri — Palmer Crabapple
M. magdeburgensis — Magdeburg Crabapple
M. micromalus — Midget Crabapple
M. cl. 'Oekonomierat echtermeyer'—Echtermeyer Crabapple
M. purpurea — Purple Crabapple
M. purpurea aldenhamensis—Aldenham Crabapple
M. purpurea lemoinei — Lemoine Crabapple
M. robusta erecta — Upright Cherry Crabapple
M. Sargentii — Sargent Crabapple
M. spectabilis—Double Chinese Crabapple
M. toringoides—Cutleaf Crabapple

It is hoped to add to this 40 more varieties in 1956, bringing the total up to about 70 varieties. So far, none of the apple varieties have died on account of winter damage and it is believed that nearly all of them will prove to be hardy. With this great number of varieties, it will be possible for the people of Denver to go to the Botanic Garden in the springtime and select the kind of trees they want to plant, and it may stimulate the growing of these trees in Denver. After all, this is a Denver type of planting.

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Source: *Green Thumb*, January, 1956
Denver Botanic Gardens

F SCHOOL ENTRY PLAZA

The roadway, curb and gutter, and "E" were renovated in 2007 by the Denver Parks Department, Denver Water and Project Angel Pride. Plans and fundraising for completing the expansion and renovation of the school's front entry plaza are currently underway.

G BASEBALL FIELD

East's baseball field is the only remnant of Denver Athletic Club Park which occupied the school site between 1890 to the mid-1920s. DAC's 15-acre complex included a horserace track, ball fields, cricket field and seating for 4,000 spectators. The current ball field was recently renovated with new bleachers, scoreboard and other improvements.

H TURF FIELD AND RUNNING TRACK

The Denver Public Schools and Project Angel Pride installed the new all-weather athletic field and track complex, with bleachers and scoreboard. The project was completed in 2007 with the installation of lighting.

J ANGEL GARDEN

Students and teachers installed the original rock garden, but it has suffered many periods of neglect over its 85 years. Plans are underway for planting low-maintenance shrubs and groundcovers that will be attractive to birds and people alike. The site recently received certification from the National Wildlife Federation.

K KEYSTONE ANGEL

All but gone, the sandstone "Angel" keystone remains an important relic from "Old East". It was placed here, atop the cornerstone, after that building was demolished in 1929. In 1886, Architect Robert Roeschlaub incorporated a cherubic face above the building entryway to symbolize the school's "dedication to youth". Six-year-old Ella Catherine Matty, Class of 1898, was the angelic model selected from 5,000 schoolgirls. The term "Angel" came to apply to all East students and, in turn, became the school mascot. The angel's young sculptor, Daniel Chester French, would be famous 35 years later for his statue in the Lincoln Memorial.

L ARAPAHOE SCHOOL BELL

This is the school bell from the Arapahoe School, Denver's original 1875 school building that was on Arapahoe Street, between 17th and 18th Streets, in downtown Denver.

1-6 ARBORETUM

A 1952 *Nature Study Trail* at East featured 101 trees and shrubs as "stations" along a route around the school's grounds. The campus is now home to 283 trees of over 50 species. Current efforts are underway to improve the health of the existing trees and shrubs, enhance their natural, seasonal beauty, and promote their educational value. Notable specimens:

1 DOWNY HAWTHORN
#1 State Champion *Crataegus mollis*
One of 82 Downy Hawthorns lining the Esplanade

2 EUROPEAN LARCH
Larix decidua

3 GINKGO
#2 State Champion *Ginkgo biloba*

4 CRABAPPLE
Malus spp. This aged tree is the last remnant of an historic row of 3 Crabapples. At least one was planted by the Class of 1937 whose time capsule was unearthed in Spring 2008 when students were planting the new, southmost crabapple.

5 HORSECHESTNUT
Aesculus hippocastanum

6 SYCAMORE MAPLE
#4 State Champion *Acer pseudoplatanus*

Special thanks to Mountain High Tree Service for its generous, skilled care of the above trees. www.MountainHighTree.com

Revised 5/14/2009

For information about
or to contribute to
the many efforts for the betterment
of East High School, visit
www.EastAngelAlliance.org

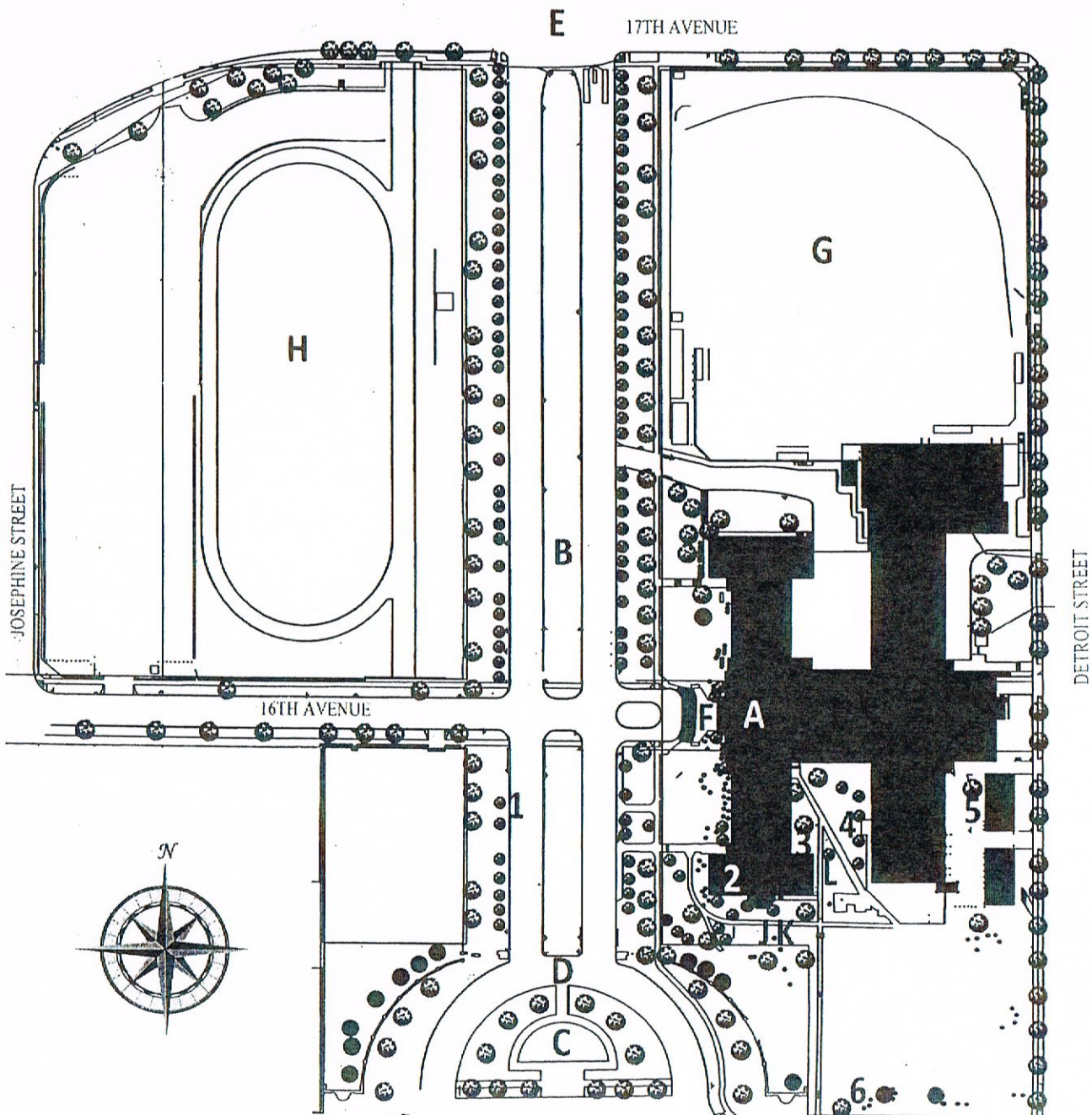
EAST HIGH SCHOOL

Historic and Notable Campus Features

Photo circa 1928 by Oscar Marinoff, Class of 19

1600 CITY PARK ESPLANADE
DENVER CO 80206
720-423-8300

EAST HIGH SCHOOL
Historic and Notable Campus Features



A FAÇADE AND CLOCK TOWER

Part of the City Beautiful movement, East High School was built in 1924 to replace the original "Old East" at 19th and Stout Streets. Denver native and 1893 East graduate George Hebard Williamson designed the Jacobean style building, which now is a Denver Historic Landmark and on the National Register of Historic Places. Its massive, four-story exterior of mottled red brick and light terra cotta decorative trim spans 417 feet. Expansive windows provide maximum light to the students inside. The clock tower, reminiscent of Philadelphia's Independence Hall, rises 162 feet high. The historic clock weighs more than one ton, with each of its faces nine feet wide. Its elaborate workings are keeping time after 85 years, thanks to the Emily Griffith Opportunity School Clock Repair Program.

B CITY PARK ESPLANADE

The integration of the East High building, the Esplanade, and City Park is one of Denver's finest examples of landscape architecture and aesthetics in city planning. With its memorial gateways and fountains, the Esplanade was designed at the turn of the century as a dramatic main entrance to Denver's City Park (**C**, **D**, **E**).

C DOLPHIN FOUNTAIN

Closed during the polio scares of the 1950s, the fountain and pool were meticulously restored the spring of 1998. Although often dry during recent drought years, the water fountain still provides a refreshing focal point for the historic Esplanade.

D DENNIS SULLIVAN MEMORIAL GATEWAY

Erected in 1917, the gateway's statues pay tribute to pioneer miners and farmers. They were restored in 1998. Plans and fundraising for further restoration of the historic gateway, walls and lion head fountains are currently underway.

E JOSEPH THATCHER MEMORIAL FOUNTAIN

The 1918 fountain is visible at the north end of the Esplanade, just inside City Park.

ACKNOWLEDGEMENTS

Project Team

Denver Parks and Recreation
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Sara Davis, Million Tree Initiative
Britta Herwig, Park Planner
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