Twin Pines Park

Tree Succession Plan

2020

Approved by Parks & Recreation Commission

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I. RECOMMENDATION SUMMARY

The Master Plan process confirmed that the park's tree canopy is a particularly vital and beloved feature of Twin Pines Park. Implementation of tree succession plan recommendations should occur in a measured manner to ensure that the enjoyment of the canopy and its benefits is sustained while gradual improvements and risk reduction occur. Timing of these action items will also be determined by resource allocation in each budget year.

1. Risk Mitigation: Proactively remove large Eucalyptus trees located in areas designated as High Risk.
    a. Identify and schedule phased removal of Eucalytpus trees
    b. Consider using logs rounds salvaged from tree removal for use as informal seating or adventure play elements in forest area.
    c. Replace each removed tree with a tree from the Preferred Tree Species list. Locate the replacement tree such that is does not impact future proposed Master Plan improvements or otherwise compromise tree canopy, or existing park improvements. If such location is not possible within Twin Pines Park, the replacement tree should be located in another city park.
    d. Document removal and replacement locations
2. Tree Canopy Assessment and Management: Assess and select the most suitable trees for preservation and remove smaller or unhealthy trees competing with the selected trees.
    a. Engage an arborist to conduct an assessment of trees greater than 6" diameter at breast height (DBH) along the banks of Belmont Creek and on the park acreage between Belmont Creek and Ralston Avenue.
    b. Implement pruning and management as recommended by assessment and management plan
    c. Replace each removed tree with a tree from the Preferred Tree Species list. Locate the replacement tree such that is does not impact future proposed Master Plan improvements or otherwise compromise tree canopy, or existing park improvements. If such location is not possible within Twin Pines Park, the replacement tree should be located in another city park.

    d. Document removal and replacement locations
3. Master Plan Integration:
    a. Review Twin Pines Park Master Plan tree assessment of the 'Campus' area of Twin Pines Park.
    b. Manage tree removal and replacement as Plan implementation occurs, e.g., potential underground detention basins in parking lot; Belmont Creek bank restoration.
4. Maintenance and Management:
    a. Continue ongoing pruning.
    b. Bay Tree Assessment: Conduct assessment for bracing improvements.
5. Succession Plan Review:
    a. Document tree removals and pre-emptive or post-removal replacements.
    b. Re-evaluate risk levels at least every two years and revise implementation plan accordingly.
6. Funding: Seek grant funding to accelerate implementation of the above-mentioned recommendations.

II. INTRODUCTION

The City of Belmont's tree canopy is a unique community resource. The City has enacted and revised, most recently in 2017, a tree ordinance to ensure that the city's tree canopy on both public and private lands is maintained, despite tree lifespan, development, and climate impacts.

Twin Pines Park is home to many of the City's most treasured trees. This report recommends actions necessary to ensure that a long-term, consistent tree management strategy is in place to preserve the park's unique and valued wooded environment and achieve a safe park experience for all visitors and protect park improvements. The actions described herein are also guided by the Twin Pines Park Master Plan approved by City Council in 2019, as well as Belmont's Climate Action Plan and General Plan.

III. SCOPE

This tree succession plan addresses significant trees within the 22-acre Twin Pines Park and City Hall complex. It establishes the criteria by which to evaluate the health, stability, native status, and location of trees within the Park and recommends near and long-term proactive actions to meet the plan's objectives. The criteria in this plan are guided by the City's Tree Ordinance, as well as site evaluation, fire hazard and climate impacts.

IV. OBJECTIVES

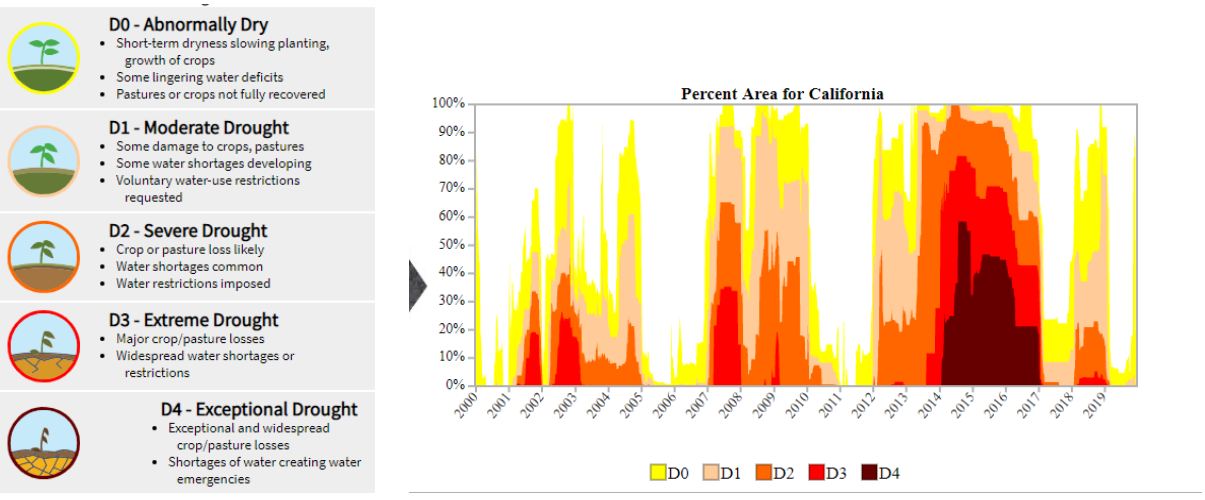
The succession plan shall address the following objectives:

1. **Manage** risk for park visitors and staff and park's natural and fabricated amenities
2. **Improve** the overall tree canopy health throughout Twin Pines Park
3. **Ensure** that the natural buffer between Ralston Avenue and Twin Pines Park and the natural shade amenity near gathering spaces are maintained
4. **Integrate** tree removal and replacement with the Twin Pines Park Master Plan design
5. **Identify** additional tree maintenance opportunities to improve health of the park's native trees
6. **Decrease** non-native tree count, yet maintain an appealing diversity of tree species
7. **Execute** recommendations using City resources and seek supplemental grant funding

V. BACKGROUND INFORMATION

The most recent formal assessment of trees within Twin Pines Park was completed in 2001. This document, prepared by Walter Levinson, certified arborist, surveyed and 'tagged' trees throughout the park to provide baseline data on tree condition and tree care recommendations for long term active management of the urban forest. A total of 491 trees of 6" diameter at breast height (DBH) in an 8-acre parcel of the park were assessed and specific near- and long-term actions were recommended for many of the trees identified in the report. The database of this effort is not currently available, but the written report is attached for reference in **Appendix A**. At the time of that assessment, 47% of the trees were determined to be in excellent to fine condition, 38% in fine/fair to fair condition, and 15% in fair/ marginal to poor condition. A total of 54 trees were identified for removal in the next 0-5 years. Six were identified as high priority removals.

Twenty years later, it is unclear how many of the identified trees have been removed. However, it is reasonable to assume that, given drought episodes experienced in California from 2001 to 2005, 2006 to 2010, and 2012 to 2017, tree disease, and natural aging, that the overall condition of trees within the park has, at best, remained constant. More likely, tree health has suffered in the past two decades. Drought impacts and tree species drought tolerance should be a increasingly important consideration in tree assessment and tree replacement selection in the coming decades.



Source: Drought.gov

The 2001 report also identified tree vulnerabilities due to changes in the park, e.g., asphalt pathways, creek erosion, foot traffic, climate change, etc. These circumstances have only increased over time. Specifically, significant creek bank erosion has occurred in several locations and a new bicycle path was completed on the northern edge of the park in 2019. Each such event can result in further compromise of select tree stability and health.

In 2018, the Parks and Recreation Department embarked on a Twin Pines Park Master Plan to identify areas of improvement in the park's pedestrian, bicycle, and vehicular circulation, while still highlighting, preserving and enhancing the unique natural features of the park, increasing recreational opportunities, and increasing park safety and accessibility. The Master Plan, approved by City Council on February 26, 2019, included several recommendations to be implemented in phases as funding permits. A Tree Succession Plan for Twin Pines Park was included in Phase 1 project recommendations. The plan is attached as **Appendix B.**

The consensus from these documents and plans indicates that, although tree and tree canopy health within the park continue to be an important responsibility of the Parks and Recreation Department, more actively addressing the physical and environmental risks posed by significant trees throughout the park should be also be a priority of this report and its recommendations.

2001 TREE SURVEY AND LONG-RANGE MANAGEMENT PLAN

This document continues to provide guidance for the pruning, maintenance, and health assessment of the park's trees. However, due to climate impacts, erosion, and pathogens introduced in Northern California in the past two decades, an updated assessment of the trees within the Park, specifically along the banks of Belmont Creek and between the Park and Ralston Avenue, is necessary to actively and proactively preserve the right trees in the right locations, eliminate risk, and generate a diverse and healthy canopy throughout the park.

TREE ORDINANCE

City of Belmont Tree Ordinance (**Appendix C**) will help to direct the assessment, preservation, removal and replacement of trees within Twin Pines Park. The framework and criteria set forth in the ordinance clearly define the parameters

for removal of diseased, damaged trees. Others, particularly non-native trees, can also be assessed for overall health, contribution to fire danger or risk to park visitors or park improvements. The Ordinance provides an effective framework and guidelines for this assessment.

TREE REPLACEMENT AND PREEMPTIVE PLANTING

The Tree Ordinance requires that a 15-gallon (minimum) replacement tree be planted for each tree removed.

After a tree has been removed in Twin Pines Park, a corresponding replacement tree will be planted in Twin Pines Park in a location that considers the ultimate layout of the park Master Plan to ensure future improvements do not then require later removal of replacement tree(s). Where a suitable location for a replacement tree is not available in Twin Pines Park, the replacement tree can be planted at another city park or property. To achieve tree canopy benefit as quickly as possible, the replacement tree will be the largest size feasible for the selected location.

Trees can also be planted prior to eventual removal of trees identified for future removal based on assessed condition.

The trees selected for replacement or preemptive planting are generally known to:

- Perform well in Belmont
- Have a favorable root structure
- Disease and pest resistant
- Contribute to the diversity of tree species within Belmont and specifically within Twin Pines Park

A list of recommended tree species recommended as replacement trees is provided in **Appendix D.**

In addition to compliance with the City's Tree Ordinance, any tree removal within Twin Pines Park will be conducted in compliance with agency notification and/or permitting requirements and with consideration for maintaining or enriching the park's wildlife habitat.

VI. ANALYSIS AND RECOMMENDATIONS

Recommendation #1: Risk Mitigation: Proactively remove large Eucalyptus trees located in areas designated as High Risk.

a. Identify and schedule phased removal of Eucalytpus trees
b. Consider using logs rounds salvaged from tree removal for use as informal seating or adventure play elements in forest area.
c. Replace each removed tree with a tree from the Preferred Tree Species list. Locate the replacement tree such that is does not impact future proposed Master Plan improvements or otherwise compromise tree canopy, or existing park improvements. If such location is not possible within Twin Pines Park, the replacement tree should be located in another city park.
d. Document removal and replacement locations

Discussion: The 2001 report recommended several eucalyptus tree groves for removal. Selected removals have occurred since then, but typically as a reactive measure when failure was imminent or had occurred. During the 2018 master planning process and in the months that followed, the City encountered three eucalyptus failures within the park requiring immediate removal and pre-emptively removed three additional eucalyptus trees whose root systems were potentially compromised by the grading done for the recently constructed bike path. Eucalyptus branch failures also occur periodically throughout the park. Catastrophic failure, risk of injury to park visitors and park improvements are liabilities the City should seek to minimize.

Eucalyptus removal has occurred or will occur in many cities throughout the Peninsula and California. The rationale for such removal includes:

1. non-native monoculture resulting from over planting in the late 1800's
2. resulting loss of biological diversity nearby
3. increased fire risk
4. risk to persons or property

Source: Addressing Regulatory Obstacles in Eucalyptus Control in San Mateo County.

The existing Eucalyptus trees in Twin Pines Park have been identified as candidates for removal. They are designated as high fire risk; generate significant litter, are competitive with other native or more desirable tree and plant species and present a hazard. The City of Belmont ordinance exempts Eucalyptus from the criteria for tree removal.

Due to their size, the removal of the Eucalyptus trees is a significant task that can only be undertaken by a professional tree removal company. During any removal operation, portions of the park will need to be closed for safety. Historically when Eucalyptus trees have fallen during storms, emergency crews were often required, resulting in extra expense to the city. Proactive removal of Eucalyptus reduces costs, protects existing park improvements from damage by falling trees and limbs. Tree replacement would occur as required by the Tree Ordinance.

To address the potential risks posed specifically by aging Blue Gum Eucalyptus trees located throughout Twin Pines Park, these trees were mapped and assessed for vulnerability and health. The map is included as **Appendix E**. These trees were grouped into natural clusters and then assessed for potential risk to park users and infrastructure based on proximity to park users and improvements, overall health, recent failures nearby, undermined root structure, and usefulness towards achieving the implementation goals of the Master Plan. The clusters to be considered are:

	Number of Trees in Cluster	**Risk Assessment**	**Relation to Master Plan Implementation**
Playground Lawn	6 (25-27, 34-36)	HIGH – proximity to park users	Phase 1

		and infrastructure	
Redwood Picnic Area	24 (41-64)	MED – HIGH Select trees have significant undermined root structure	Contingent upon grant funding for Belmont Creek Flood control project; Significant pruning completed in 2012
West End, North Side of Creek	16 (65-80)	MED – HIGH Select trees have significant undermined root structure	Hazard evaluation criteria will determine sequencing
Adventure Playground Area	3 (81-83)	MED - Proximity to recent failures	Hazard evaluation criteria will determine sequencing
South of Creekbank	6 (28-33)	MED	Contingent upon grant funding for creek bank stabilization
Near Park Buildings, North of Creek	4 (21-24)	HIGH – proximity to park users and infrastructure	Hazard evaluation criteria will determine sequencing
Hillside	4 (37-40)	LOW	Contingent upon grant funding for creek bank stabilization; possible volunteer trail-building
City Hall Parking Lot	3 (1-3)	HIGH – proximity to visitors and infrastructure	Not included in Twin Pines Park Master Plan

Private Residences	15 (4-20)	MED - Proximity to recent failures and city infrastructure	Not included in Twin Pines Park Master Plan

Recommendation #2: Tree Canopy Assessment and Management Plan: Assess and select the most suitable trees for preservation and remove smaller or unhealthy trees competing with the selected trees.

a. Engage an arborist to conduct an assessment of trees greater than 6" diameter at breast height (DBH) along the banks of Belmont Creek and on the park acreage between Belmont Creek and Ralston Avenue.
b. Continue ongoing pruning and management as recommended by assessment and management plan
c. Replace each removed tree with a tree from the Preferred Tree Species list. Locate the replacement tree such that is does not impact future proposed Master Plan improvements or otherwise compromise tree canopy, existing park improvements, and, where possible, park visitor experience. If such location is not possible within Twin Pines Park, the replacement tree should be located in another city park.
d. Document removal and replacement locations

Discussion: Many of the park's trees are not impacted by the Master Plan vision, but nonetheless will benefit from assessment for tree canopy improvement. These trees should be actively managed to ensure longevity and health. In particular, the park acreage to between Ralston Avenue and Belmont Creek will benefit greatly from canopy assessment and optimization. This area was identified in the Master Plan to include a natural adventure play area at its western end but is also passively enjoyed in its natural state by a great number of park visitors.

The density of the trees creates competition for sun light and nutrients. Stressed trees are more susceptible to drought and insect attack. Removing some trees can ease the competition, letting the remaining trees grow big and healthy. Proactive, early thinning is key, before trees start to fight over water and light and are weakened by competition. Selective tree removal should anticipate the conflicts that will occur with the mature growing of the trees.

Within a tree stand or cluster in the park, trees most suitable for preservation, not only based on individual tree health, but in relation to its neighboring trees, should be identified. Those trees which compete and thus negatively impact the cluster should be removed. This proactive approach will result in a forest of large, healthy trees. The assessment for preservation or removal will be done based on the criteria of the City's Tree Ordinance, but then will further consider a tree's Suitability Factor and Rating in relation to its neighboring trees as described below (or a similar process ads defined by the independent arborist engaged to conduct the assessment). Tree replacement would occur as required by the Tree Ordinance.

Criteria for Selecting Existing Trees to be preserved on the Basis of Suitability

Suitability Factors

Health: Overall tree vigor, extension of new growth, proper closing of wounds and the presence of plant pathogens.

Structure: The overall tree architecture, including roots, trunk, limbs, and branches are visually assessed for defects. A defect that can be corrected by proper arboricultural practices may allow a tree to be preserved.

Useful Life Expectancy: The life of a tree is much like a bell-shaped curve; where aging accentuates tree vigor until a point at the top of the curve where aging now reduces tree vigor and decline begins. A species may be long lived but have a poor structure that is prone to fail and should not be considered suitable.

Tree Species: The factors described above are predicated on the tree species. Certain species grow slowly and decline slowly. Other species grow quickly and decline quickly. Tree species that are invasive, or a nuisance or have an inherently poor structure are to be avoided.

Suitability Ratings

When the above factors are considered, a tree can be as HIGH, MODERATE or LOW in suitability for preservation. An explanation for each rating is provided below.

HIGH: Trees which are significant and expected to provide long-term contributions to the site. They display fair or better health and fair or better structural condition. On-going suitability may require typical maintenance practices commonly associated with the tree species. These trees are the most suitable for retention measures relative to neighboring trees and are worthy of consideration during the design process or design revision.

MODERATE: Trees which contribute to the site but provide less than significant contribution for reasons of health, structural condition, or appearance relative to neighboring trees. On-going suitability will require properly implemented maintenance practices. Design revisions to preserve these trees may not be warranted.

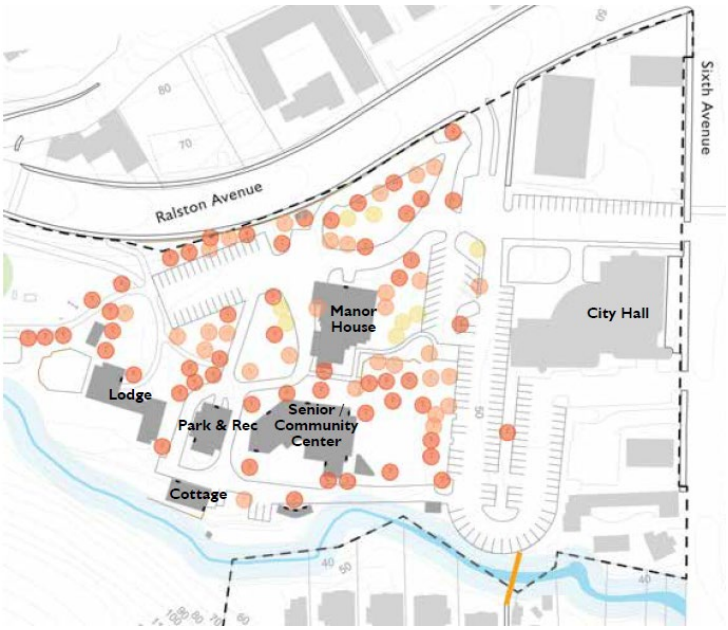
LOW: Trees which provide minor contributions to the property for reasons of poor health, structural conditions or appearance relative to neighboring trees. A tree species that is a nuisance due to litter, will grow too large for the area or is known to develop a structure prone to failure is also rated low in suitability. Trees in this category are typically not expected to benefit or respond to acceptable corrective measures. Removal of these trees will often allow the safe, useful, and aesthetic enjoyment of the property. *Preservation of low rated trees is not recommended.*

*Preservation is referred to as “Conservation” in ANSI A300 (Part 5) – 2005 Management

Recommendation #3: Master Plan Integration:

a. Review Twin Pines Park Master Plan tree assessment of the 'Campus' area of Twin Pines Park
b. Manage tree removal and replacement as Plan implementation occurs, e.g., potential underground detention basins in parking lot; Belmont Creek bank restoration

Discussion:



The Twin Pines Park Master Plan study included an evaluation of the trees in the central or 'campus' portion of the Park. The Plan includes recommends changes to the circulation. Parking, and amenities in this 'campus' area. The Plan design intentionally allows for the protection of most of the trees identified as Heritage Trees – healthy, iconic trees within the Park. High Value Trees, also deemed healthy, are slated to remain in place unless and until implementation of a critical component of the master plan requires removal. Moderate Value Trees are those that should be protected where feasible but can be removed to achieve the Master Plan vision. The evaluation and identification of trees near the parking lots and buildings prepared by Gates & Associates is included as **Appendix F.**

The trees in the campus area were categorized as follows:

Heritage Trees – These trees which are significant stature based in size, health a species. The Master Plan seeks to protect these trees.

High Value Trees – trees which are high value based on size, health, or species. These trees should only be removed where their preservation would prevent a critical component of master plan visions implementation.

Moderate Value – trees which based on size; health and species should be protected where feasible but can be removed to accommodate vision.

The updated Tree Assessment recommended above will complement the 'campus' area assessment. When the City implements recommendations from the Twin Pines Master Plan in any area of the park for which an assessment has been conducted, that assessment will be included in the design consideration and implementation.

Recommendation #4: Continue to conduct ongoing maintenance of existing trees.

a. Continue ongoing pruning
b. Bay Tree Assessment: Conduct assessment for bracing improvements.

Discussion: Parks staff will continue to address tree maintenance opportunities as outlined in the 2001 Long Range Management Plan and, when available, in the updated Tree Assessment and Management Plan. Specifically, the 2001 Tree report recommended that supplemental bracing be explored for the Heritage Bay Tree, located in front of the Lodge Building. This tree is an icon of Twin Pines Park and should be uniquely assessed for health and safety. Staff will engage a professional to develop recommendations for bracing upgrades.

Recommendation #5 Succession Plan Review:

a. Document tree removals and pre-emptive or post-removal replacements.

b. Re-evaluate risk levels at least every two years and revise implementation plan accordingly.

Discussion: This succession plan complies with the city's commitment to enhancing the City's tree canopy by planting one or more trees for each tree removed as a result of the removal recommendations outlined above. These trees will be located to enhance the park visitor experience and integrate naturally into the components of the Twin Pines Master Plan.

For many years, the City and volunteer groups have planted trees in the Park. The log and map in Appendix G documents the locations of recently removed and replaced trees. This document will be updated at least annually to record tree replacements. **(Appendix G)**

Furthermore, this Succession Plan's implementation schedule document will be reviewed bi-annually to measure progress and adjust for factors such as climate, construction, or disease.

Recommendation #6: Seek grant funding to accelerate implementation of the above-mentioned recommendations.

Discussion: Tree Canopy grant funding opportunities will be sought to finance tree removal and/ or replacement. The City will continue also to apply for Tree City USA certification each year.

APPENDICES

APPENDIX A – Twin Pines Park Tree Survey and Long-Range Management Plan, 2001

APPENDIX B – Twin Pines Park Master Plan, 2019

APPENDIX C – Tree Ordinance

APPENDIX D – Tree Species Recommendation for Twin Pines Park

APPENDIX E - Twin Pines Park Eucalyptus Inventory, 2019

APPENDIX F - Twin Pines Park Master Plan Tree Assessment, 2018

APPENDIX G - Twin Pines Park Tree Removal and Replacement Log, 2020 - DRAFT

APPENDIX A – Twin Pines Park Tree Survey and Long-Range Management Plan, 2001

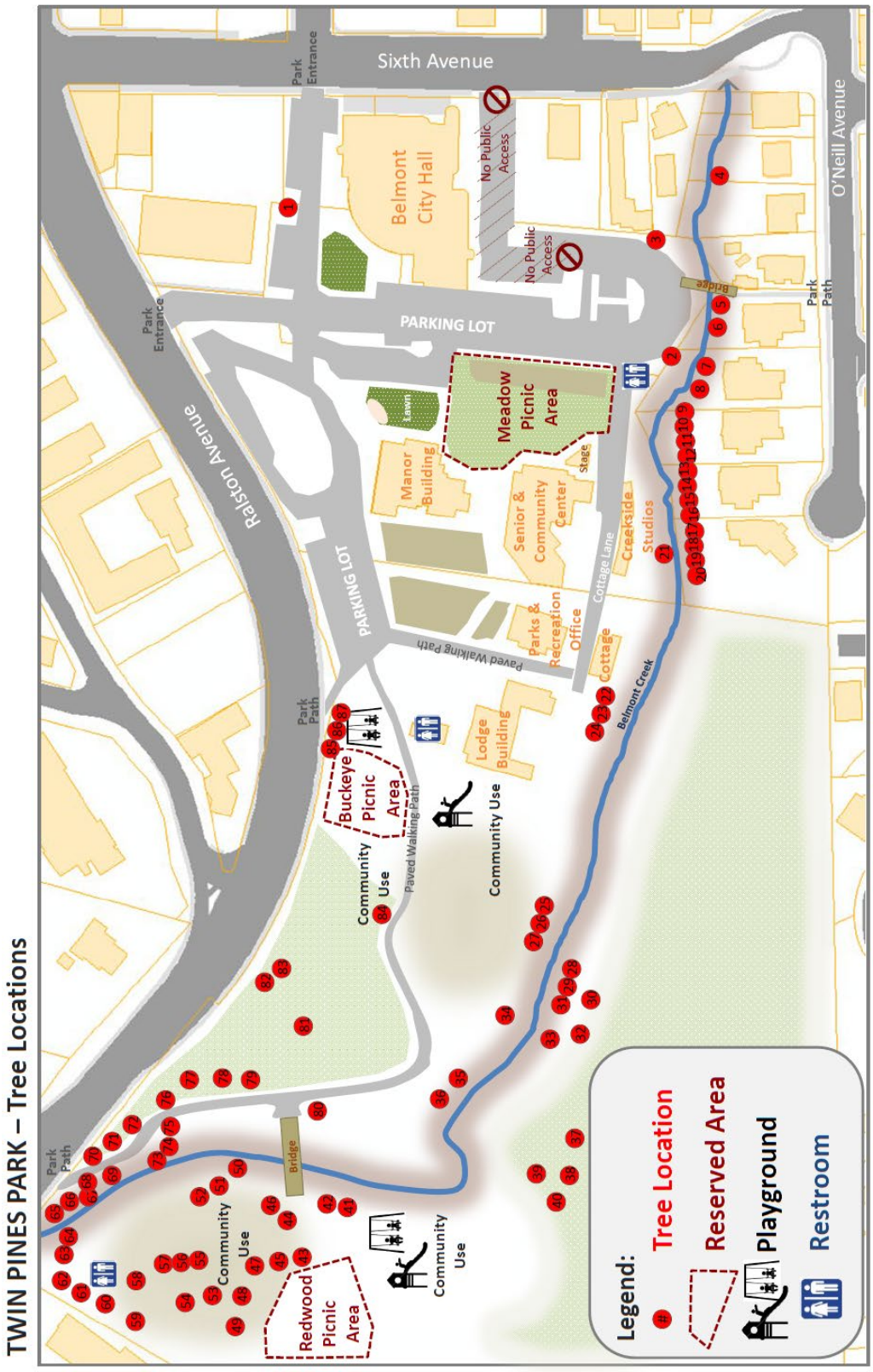
APPENDIX B – Twin Pines Park Master Plan, 2019

APPENDIX C – Tree Ordinance

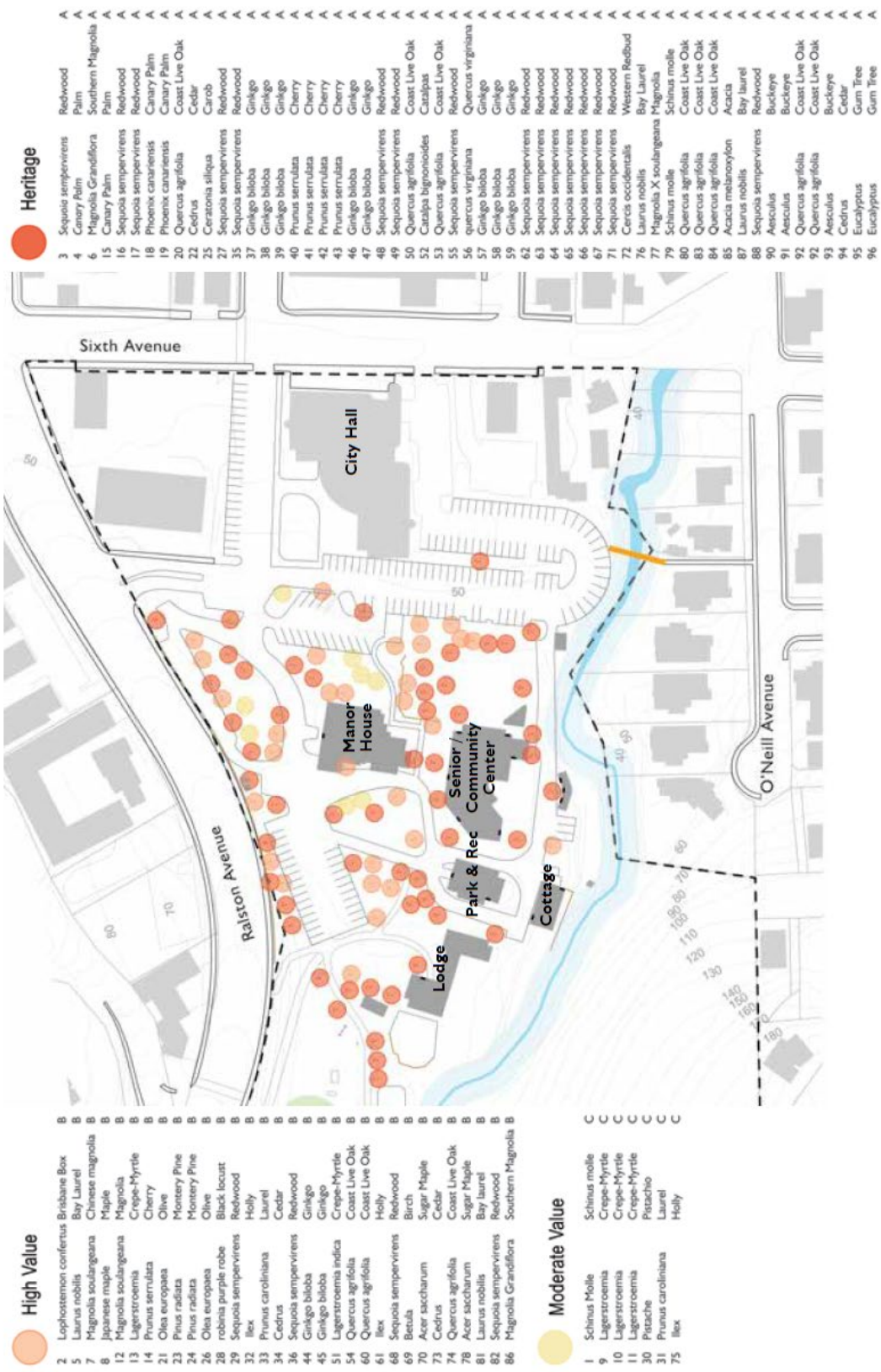
APPENDIX D – Tree Species Recommendation for Twin Pines Park

			Height at maturity		
Common Name	Botanical Name	Native	<25’	35 – 40’	> 40’
Big Leaf Maple	Acer macrophyllum	*			*
Madrone substitute	Arbutus ‘Marina’	*		*	
Blue Atlas Cedar	Cedrus atlantica ‘Glauca’				*
Deodar Cedar	Cedrus deodara				*
Eastern Redbud	Cercis canadensis		*		
London Plan Tree	Platanus x acerfolia ‘Columbia’				*
Coast Live Oak	Quercus agrifolia	*			*
Valley Oak	Quercusl obata	*			*
Pin Oak	Quercus palustris				*
Cork Oak	Quercus suber				*
Southern Live Oak	Quercus Virginiana				*
Chinese Tallow Tree	Sapium sebiferum ‘Mountain Moon’			*	
Sterling Silver Linden	Tilia tomentosa ‘Sterling’				*
California Buckeye	Aesculus californica	*		*	
California Bay Tree	Umbellularia californica	*			
California Redwood	Sequoia sempervirens	*			*
Tristania Laurina	Tristaniopsis laurina			*	
Trident Maple	Acer buergerianum			*	
Saratoga Laurel	Laurus nobilis 'Saratoga’		*		
Chinese Flame Tree	Koelreuteria bipinnata			*	
Chinese Pistache	Pistacia chinensis			*	
Crepe Myrtle	Lagerstroma indica		*		
Spanish Fir	Abies pinsapo				*
Maidenhair tree	Ginkgo biloba			*	
Canary Island pine	Pinus canariensis				*

APPENDIX E - Twin Pines Park Eucalyptus Inventory, 2019



APPENDIX F- Twin Pines Park Master Plan Tree Assessment, 2018



APPENDIX G- Twin Pines Park Tree Removal and Replacement Log, 2020

Trees removed

Date	Tree Species	Quantity	Location	Reason for removal
2019	Maple	1	Lodge patio	Not thriving
2019	Eucalyptus	1	Creek near Bridge to O'Neill	Failure; Emergency removal
2019	Eucalyptus	3	North of new bike path	Non-native; Roots compromised during bike path construction
2019	Eucalyptus	3	North of walking path; in 'Adventure Play' area	Failure; Emergency removal

Trees planted

Date

Date	Tree Species	Quantity	Location
2020	Valley Oak	1	Lodge patio
2019	Coast Live Oak	1	Near senior center entrance
2019	Coast Live Oak	1	Cottage Lane entrance from parking lot
2019	Coast Live Oak	1	City Hall parking lot near bridge
2018	Coast Live Oak	5	Eric Reed Memorial Grove