

# Santa Clara Valley Water District

## Urban Forest Management Plan

November 2012

*Prepared for:*

Vegetation Management Unit

Santa Clara Valley Water District

*Prepared by:*

Jennifer Codianne and Suzanne Remien

Santa Clara Valley Water District



**Cities served:** 15

**Budget:** \$315 million

**Water imports:** 127,900 AF

**Treatment plants:** 3

**Water retailers served:** 12

**County water use:** 370,000 AF

**Reservoirs:** 10

**Population served:** 2 million

**Miles of streams:** 275

**Pumping plants:** 3

**Groundwater recharge:** 99,800 AF

## EXECUTIVE SUMMARY

This plan provides a framework for managing the Santa Clara Valley Water District's (District) urban forest resources. The plan is based on the condition of the forest as surveyed in 2012 and an analysis of various trends that have shaped the urban forest and that may influence it in the future. The major portions of this document are outlined below.

1. **Management plan for the District's urban forest.** *This section discusses the current issues and trends that are likely to impact the District's urban forest over the next 18 years. These include:*

- *Tree canopy cover has increased drastically since the 1940's (a 100% increase) due to the closing of the rock quarry and the creation of the percolation ponds. This plan will insure a continued increase in canopy cover occurs through the length of the plan.*
- *Establishing and maintaining target levels of tree canopy coverage throughout the District's campus.*

2. **The current state of the District's urban forest and tree management practices.**

*This section presents the results of the tree assessment and canopy coverage surveys of the District's urban forest.*

- *Tree canopy coverage as of 2006.*
- *Tree assessments as of 2012*

3. **Funding sources for urban forestry.** *This section lists a number of possible funding sources available.*

4. **Technical guides for urban forest management.** *This section lists technical guides that describe the science of urban forestry management.*

## TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	2
TABLE OF CONTENTS.....	3
VISION STATEMENT.....	5
MISSION STATEMENT.....	5
INTRODUCTION.....	6
Historical Context.....	6
Environmental Context.....	9
Why We Need A Plan.....	10
Benefits Provided By Trees.....	10
Scope of the Plan.....	11
STATUS OF THE URBAN FOREST.....	11
Historical Context.....	11
Environmental Context.....	12
Tree Resource Assessment.....	12
Management.....	18
Community.....	18
STRATEGIC PLAN.....	19
Tree Canopy Cover Issues and Trends.....	19
Tree and Forest Health Issues and Trends.....	21
Management of the Urban Forest Issues and Trends.....	24
Goals.....	26
Monitoring Plan Effectiveness.....	26
APPENDIX.....	27
Ordinances.....	27

IMPLEMENTATION PLAN.....28

Implementation Plan Matrix.....29

LIST OF FIGURES

Figure 1. Historical Map of Large Trees on District Campus.....7

Figure 2. View of Alamos Recharge Pond on District Campus.....8

Figure 3. View of the Guadalupe River on District Campus..... 8

Figure 4. Genus Types of Trees Located on District Campus..... 13

Figure 5. Planting Locations of Trees Located on District Campus..... 14

Figure 6. Condition Assessment of Trees Located on District Campus..... 14

Figure 7. Management Needs of Trees Located on District Campus..... 15

Figure 8. SCVWD Tree Assessment Survey..... 16

Figure 9. SCVWD Tree Canopy Cover..... 17

## **VISION STATEMENT**

The Santa Clara Valley Water District will strive to protect and enhance the health and diversity of our urban forest as an essential social, environmental, economic, and community asset for future generations.

## **MISSION STATEMENT**

The mission of the Santa Clara Water District is “to provide for a healthy, safe and enhanced quality of living in Santa Clara County (SCC) through watershed stewardship and comprehensive management of water resources in a practical, cost effective and environmentally sensitive manner for current and future generations”.

The urban forest is an integral part the District’s mission. The health of the District’s urban forest is a direct reflection on the health and well-being of the community at large. The urban forest provides numerous benefits to the community such as removing pollution from the air and reducing runoff, providing healthy habitat for both fish and wildlife. The District’s urban forest provides open space along an urban stream corridor that helps to define the community. Trees reduce energy needs through shading, reduce noise and soften hard edges of buildings and paved areas.

The coordinated management of the District’s urban forest will allow the community to recognize trees as a vital part of the District’s infrastructure and ecosystem. Providing adequate and stable funding will allow the District to maintain and enhance the urban forest.

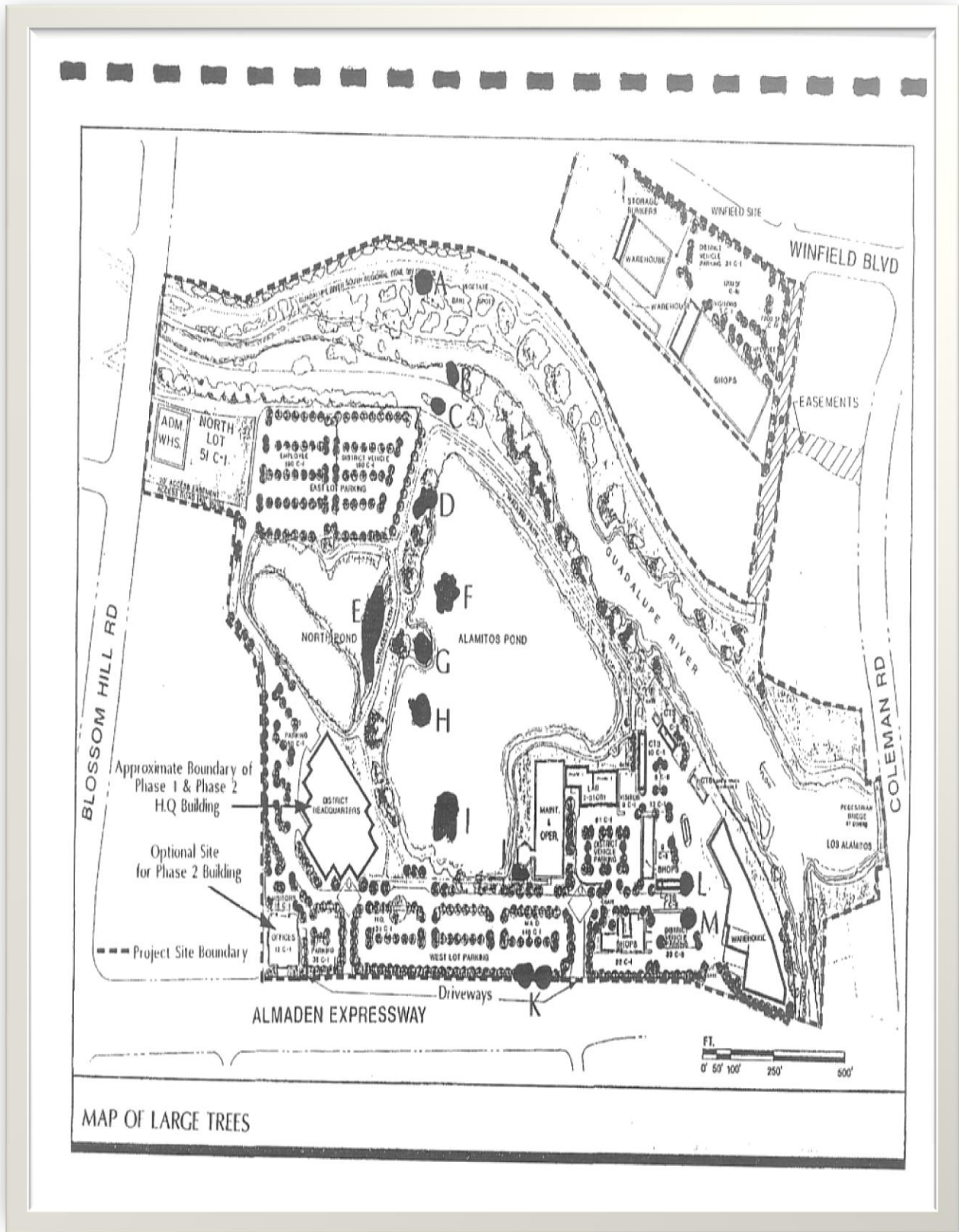
## INTRODUCTION

The Santa Clara Valley Water District is located in San Jose, Santa Clara County, California. San Jose has just been ranked as the “fittest city” in the nation. As such urban forests play an integral role in providing outdoor recreation areas for the citizens of San Jose to remain fit. San Jose is located at the southern end of San Francisco Bay and is the largest city in Santa Clara County and also the most populous in Northern California.

### Historical Context

The area where the District’s campus is currently located was once a sandstone and gravel quarry owned and operated by A.J. Raisch Paving Company and originally established in the 1940’s. The nearby Almaden Lake Park, currently operated by the City of San Jose was created as a result of the craters formed through the process of quarrying sandstone and gravel. In the 1940’s, orchards of prune trees replaced the quarry, however none of these trees remain on site. The area was developed for the District’s Campus in the late 1970’s and consisted of a mixture of orchards, commercial properties, and residential properties(Figure 1).

Almaden reservoir which is located in the Santa Cruz Mountains south of Campus was built in 1936 by the Civil Conservation Corps, as part of a work program that President Roosevelt initiated. Almaden Reservoir is one of six original reservoirs built in Santa Clara County. “Almaden” in Spanish means “mineral” or “mine”. In 1845 Andres Castillero discovered a quicksilver (mercury) deposit in the area now known as the Almaden hills. At one time, the New Almaden Mine was the largest mercury-producing mine in the Americas. The dam and reservoir are located in these same hills and over the years mercury has flowed from the mine into Almaden Reservoir, Alamitos Creek, and Guadalupe Creek which in time flowed into Alamitos Pond and the Guadalupe River which bisects the District’s Campus and eventually on to San Francisco.



**Figure 1: Historical Map of Large Trees on Santa Clara Valley Water District Campus**



**Figure 2: View of Alamitos Recharge Pond on District's Campus**



**Figure 3: View of the Guadalupe River on District's Campus**



## **Environmental Context**

The location in which the District's Campus exists is very unique. The Santa Cruz Mountains are located 8 miles south of the District Campus. The water from these mountains flows into the Almaden Reservoir and then into Alamos Creek and Guadalupe Creek. Both of these drainages join the Guadalupe River at the south end of the District's Campus. The District Campus is bisected by the Guadalupe River and contains two manmade groundwater recharge ponds on site, North Pond and Alamos Pond.

The District Campus consists of four distinct habitat types: open water, freshwater marsh, upland/riparian, and landscape. The open water habitat is comprised of the surface acreage of open water without emergent vegetation. The freshwater marsh is comprised of dense emergent vegetation growing in shallow water, mostly cattails located around the perimeter of North Pond. The upland/riparian habitat is comprised of a mixture of native and non-native trees and shrubs located primarily along the south and east sides of Alamos Pond and along both sides of the Guadalupe River.

The Santa Clara Valley Water District's Campus is located in the USDA hardiness zone 9b, with the lowest winter temperatures ranging from 20 to 25 degrees Fahrenheit. The average high temperature in July is 85 degrees and the average high temperature in January is 59 degrees Fahrenheit. The average annual precipitation of 22.99 inches happens mostly in the winter and spring months with little to no rain during the summer and fall months. Annual average wind speed is 15.54 mph, a little higher than the average for the State of California. Marine fog is apparent in the summer months due to the proximity of the Pacific Ocean.

The soil located along the Guadalupe River is rich quaternary alluvial soil, a fine grained soil deposited by water flowing over the flood plain from the nearby Los Capitancillos and

Santa Teresa Hills. The alluvium consists of predominantly coarse sands and gravels, interbedded with thin continuous layers of finer material. Underlying the alluvial soils is bedrock of either the Franciscan Assemblage or the Great Valley Sequence. Excluding the Guadalupe River, the site is fairly level in elevation ranging from 191 to 196 feet (NGVD).

Irrigation and weed control are usually necessary for the first 3 to 5 years after planting of tree seedlings throughout the District's urban forest.

### **Why We Need a Plan**

We need a plan that will ensure that the community's trees will be adequately managed to maintain the many benefits of trees which are critical to the community's well being and overall quality of life. This plan will protect the investment of the District's urban forest by providing a blueprint for enhancing and improving the asset of the urban forest by maximizing the benefits while minimizing the costs required to maintain this resource.

With a vision and a plan for the management of the District's urban forest, it is unlikely that the forest will be able to reach its maximum potential and provide the many benefits that the community desires and deserves. This plan will ensure that the District's urban forest.

### **Benefits Provided by Trees**

Trees provide social, communal, environmental, and economic benefits. Trees have profound social benefits as they make life more pleasant allowing a person to feel peaceful, restful, and tranquil. Trees are part of the community providing privacy, emphasizing views, or screening out objectionable views. They reduce glare and reflection and often enhance architecture. Trees alter the environment in which we live in by conserving water, moderating climate, providing wildlife habitat, and improving air quality by storing carbon monoxide, ozone, and sulfur dioxide. Trees provide economic benefits by reducing energy costs and increasing

property values. These benefits all contribute to enhancing the quality of life in Santa Clara County.

## **Scope of the Plan**

The objective of the Districts' Urban Forest Management plan is to effectively manage all site trees of the urban forest located within the boundaries of the District's Campus. The District Campus is bordered by Almaden Expressway to the west, Guadalupe River to the east, Blossom Hill Road to the north, and Guadalupe Creek to the south. The District Campus also includes the Winfield site, located on the west side of Winfield Boulevard, north of Coleman Road. Trees included within the scope of this urban forest management plan are all planted horticultural trees, both retained and planted native trees, and existing non-native trees located throughout the open space areas of the section of the Guadalupe River that bisects the District Campus and the open space areas around the perimeters of North Pond and Alamitos Pond.

## **STATUS OF THE URBAN FOREST**

### **Historical Context**

Much of the vegetation within the District's Campus had been removed for urban development. After the sandstone and gravel quarrying operations had ceased, the site was capped with a 5-6 foot layer of poorly compacted debris and fill. In 1977 the North Pond was excavated and the quarry fine materials from that area were removed. However, except for the open space areas on either side of the Guadalupe River most of the rest of the District Campus remains underlain by a 6-19 foot layer of highly compressible materials. In the late 1990's the District further developed the site within the previously residential area along Allencrest Drive. Many of the original large native trees in this area were removed for development of the Headquarters Building and replaced with non-native horticultural trees.

However, the areas around the perimeter of Alamitos Pond and the north side of the Guadalupe River where it bisects the District Campus were revegetated with native tree and shrub species as mitigation for the construction of the Headquarters Building.

## **Environmental Context**

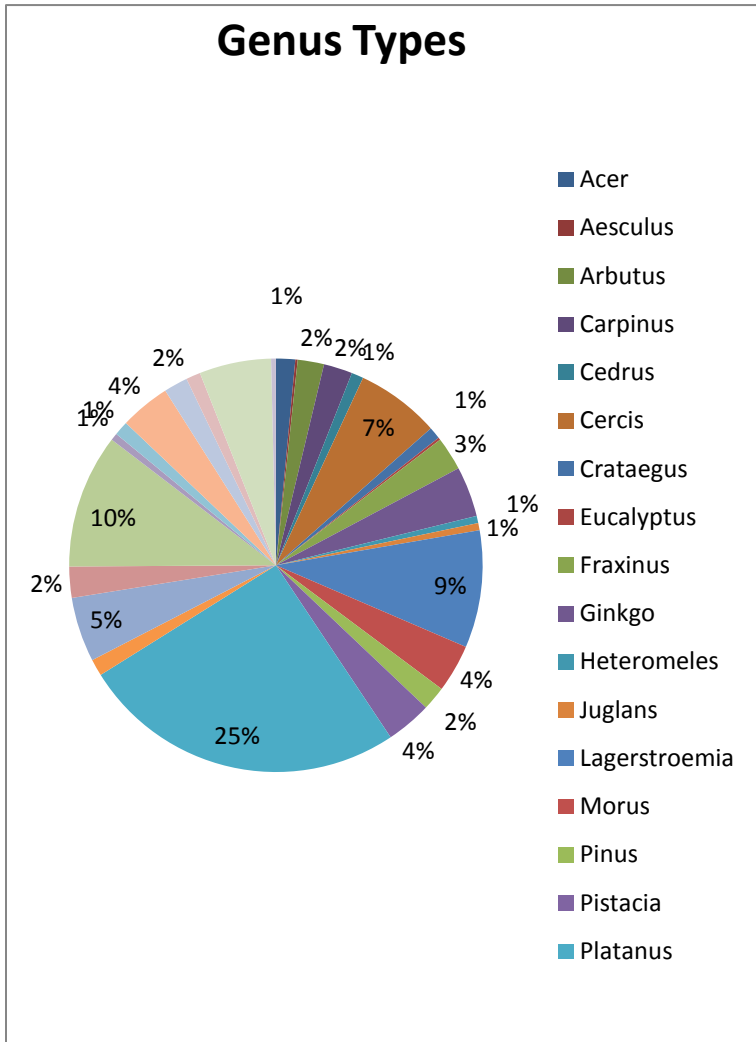
The needs of the District's urban forest were determined by examining the physical characteristics of the soils such as, available water, organic matter, drainage, depth to bedrock, fertility, and windthrow potential. The suitability of the District Campus for fish and wildlife habitat was also considered as recommendations of tree species were made for landscape and mitigation design projects.

There are many native shrub and tree species located within the District's urban forest that have high habitat value for fish and wildlife. Native species include Coast live oak (*Quercus agrifolia*), Valley Oak (*Quercus lobata*), Arroyo willow (*Salix lasiolepis*), Red willow (*Salix lasiolepis*), Shining willow (*Salix lucida*), Box elder (*Acer negundo*), Fremont cottonwood (*Populus fremontii*), Black cottonwood (*Populus balsamifera*), Western sycamore (*Platanus racemosa*), Mexican elderberry (*Sambucus mexicana*), Coast redwood (*Sequoia sempervirens*), Mulefat (*Baccharis douglasiana*), Coyote brush (*Baccharis pilularis*), and California buckeye (*Aesculus californica*).

## **Tree Resource Assessment**

A tree inventory is currently in progress, trees are mapped using a handheld GPS and various categories are being logged to assess the existing trees' resources. Categories are as follows: species of tree, DBH of tree, location zone, land use, condition, hazard rating, pruning needs, and target potential. To date 534 trees have been measured, however the inventory is unfinished at this time.

**Figure 4: Genus Types of Trees Located on District’s Campus**



The species distribution is as follows:

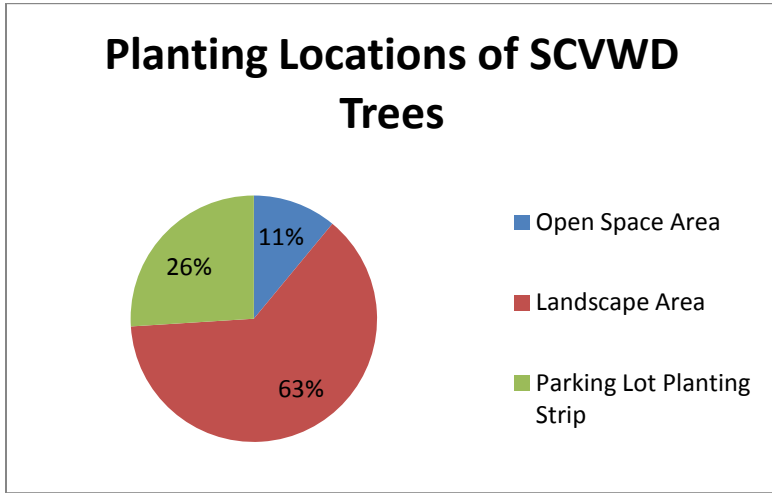
Genus type	# Trees	%
Acer	8	1%
Aesculus	1	0%
Arbutus	11	2%
Carpinus	12	2%
Cedrus	5	1%
Cercis	35	7%
Crataegus	5	1%
Eucalyptus	1	0%
Fraxinus	14	3%
Ginkgo	21	4%
Heteromeles	3	1%
Juglans	3	1%
Lagerstroemia	49	9%
Morus	20	4%
Pinus	10	2%
Pistacia	19	4%
Platanus	136	25%
Podocarpus	7	1%
Populus	27	5%
Pyrus	13	2%
Quercus	56	10%
Rhus	3	1%
Salix	6	1%
Schinus	21	4%
Sequoia	10	2%
Styraciflua	6	1%
Ulmus	30	6%
Unidentified	2	0%
<b>Total</b>	<b>534</b>	<b>100%</b>

**Species Distribution:** There are 534 trees and 28 different Genus types found growing on the Santa Clara Valley Water District’s campus.

**Figure 5: Planting Locations of Trees Located on District’s Campus**

**Planting Location:**

The following describes the planting locations throughout the District Campus. The majority of the trees are planted in the landscaped areas (63%).

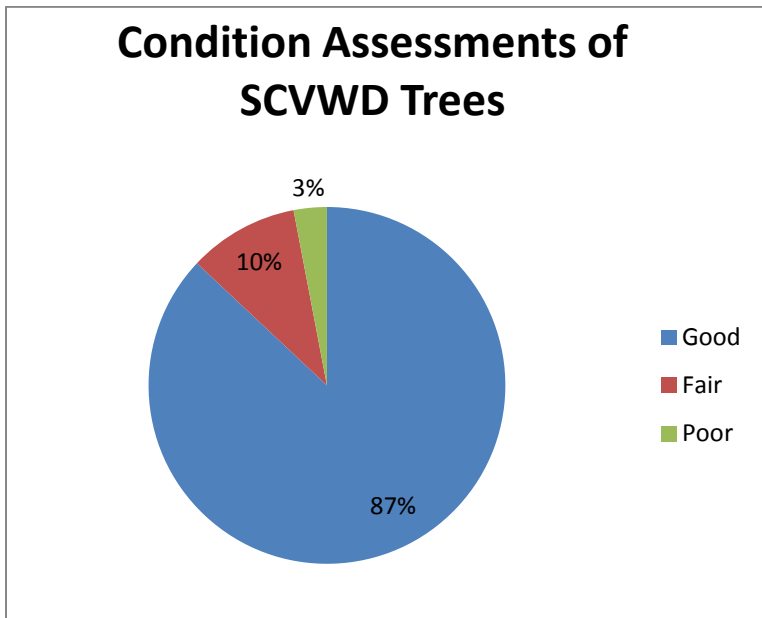


Planting Locations:	# trees	%
Open Space Area	94	11%
Landscape Area	337	63%
Parking Lot Strip	103	26%
<b>Totals</b>	<b>534</b>	<b>100%</b>

**Figure 6: Condition Assessment of Trees Located on District’s Campus**

**Condition Assessment:**

The overall condition assessment of the trees on the District Campus found that 87% are in good condition.

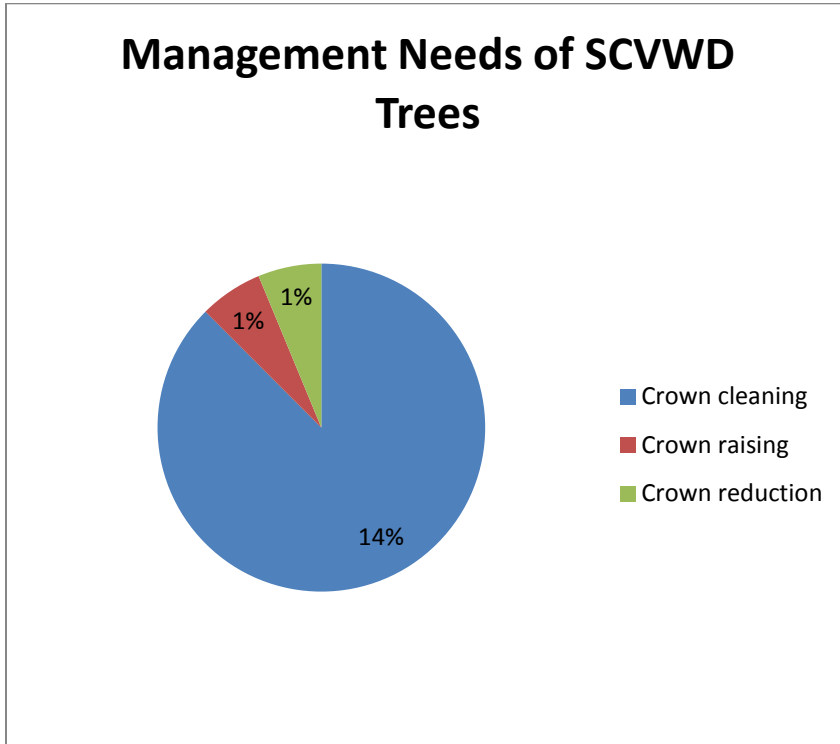


Condition	# trees	%
Good	461	87%
Fair	55	10%
Poor	18	3%
<b>Totals</b>	<b>534</b>	<b>100%</b>

**Figure 7: Management Needs of Trees Located on District’s Campus**

**Management Needs:**

The following describes the specific management needs of the trees throughout the District Campus. Only 16% or 119 of the trees have pruning needs at the time of our tree inventory.



Management Needs:	# trees	%
Crown cleaning	76	14%
Crown raising	38	1%
Crown reduction	5	1%
<b>Totals</b>	<b>119</b>	<b>16%</b>

Canopy coverage analysis was performed on the District’s Campus. The process takes 3” resolution aerial photography, LiDAR, and GIS data and integrates them into a program to extract the canopy elements. The program is written in eCognition which is an Object Oriented Image Analysis (OBIA) software platform. The program works by identifying all groups of pixels over a certain size that have a high level of reflectance in the green part of the spectrum and a low level of reflectance in the red part of the spectrum. These candidates are then filtered by height (based on the LiDAR) to separate the green grass from the green trees. A number of other factors such as proximity and context are then used to identify tree candidates that are in tough locations such as in the shadows of buildings and bridges. The final candidate set is cleaned up by manual photo interpretation to produce the deliverable product.

# SCVWD Campus Urban Forest Management Plan

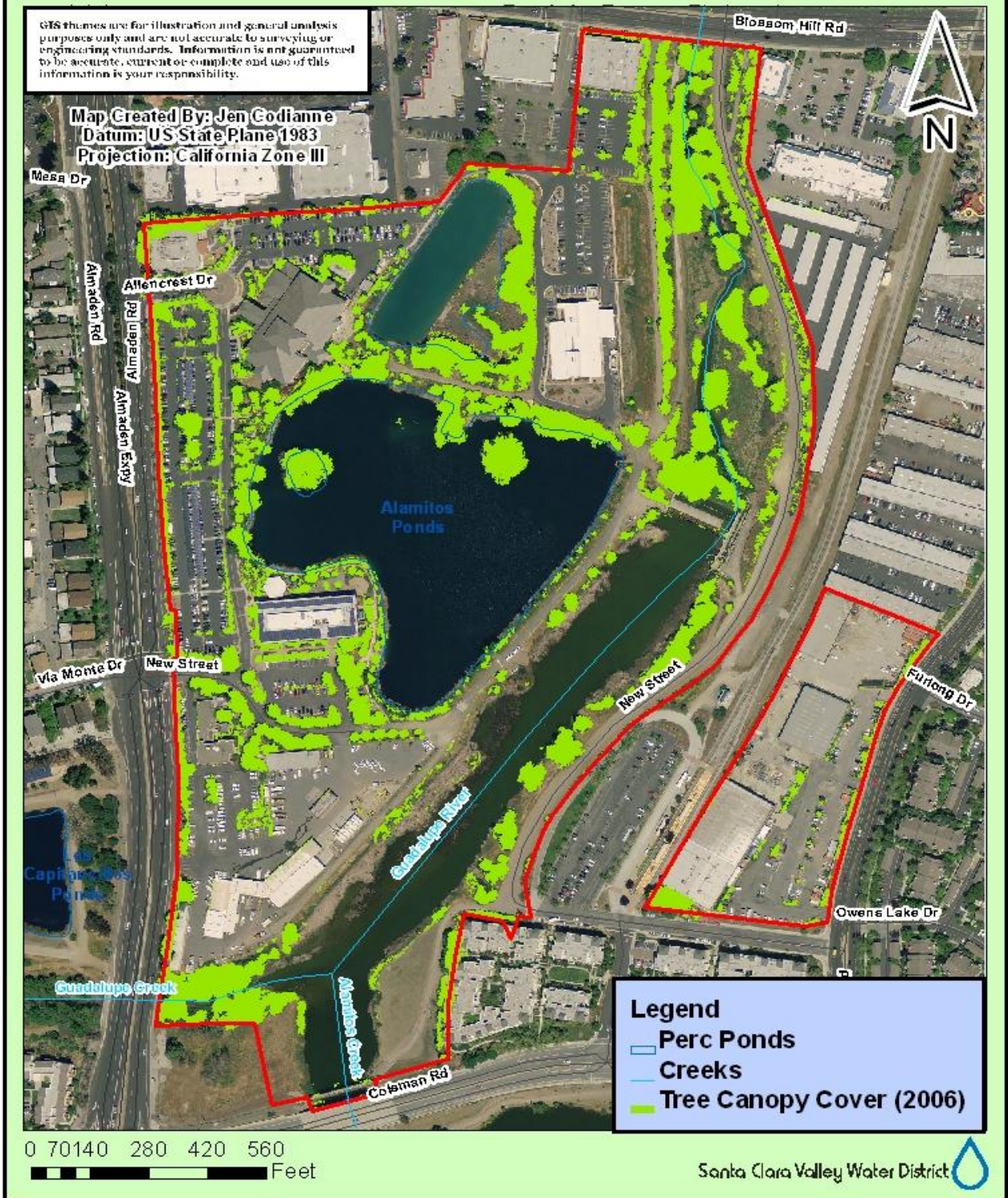
GIS themes are for illustration and general analysis purposes only and are not accurate to surveying or engineering standards. Information is not guaranteed to be accurate, current or complete and use of this information is your responsibility.



**Figure 8: Santa Clara Valley Water District Campus Tree Assessment Survey**



# Santa Clara Valley Water District Tree Canopy Cover (2006)



**Figure 9: Santa Clara Valley Water District Campus Tree Canopy Coverage**

The tree canopy cover analysis found that the percentage of tree canopy cover on the 70 Acre District Campus was 19% as of 2006 when the last countywide high resolution aerial was flown over Santa Clara County. Canopy coverage should be analyzed again when new aerial images are available and as necessary from that time forward to establish canopy growth.

## **Management**

All tree care responsibilities are carried out by the Vegetation Management Unit within the Santa Clara Valley Water District. The actual work is contracted out to the landscape maintenance contractor or a tree maintenance contractor depending on services needed.

Their responsibilities include:

- *Coordinating the planning, planting, and maintenance of District Campus trees.*
- *Maintaining, planting, and replacing trees as needed.*
- *Providing 24-hour emergency response services for tree related emergencies.*
- *Enforcing the City of San Jose code to preserve significant trees.*

## **Community**

The District's urban forest is actively used as a recreational area with activities such as walking, jogging, fishing, and bird watching. Trees and vegetation provide an aesthetically pleasing environment throughout the seasons for community members to enjoy. The District continuously polls property owners adjacent to the creeks and rivers in Santa Clara County for their opinions on the importance of maintaining open space areas for recreational activities. The data has shown that the community prefers well maintained trees and vegetation in the District's urban forest and that these natural areas provide many benefits to the community beyond their economic values.

## Stakeholders:

- *General public - community*
- *SCVWD Board of Directors*
- *Boy Scout Troop 286 (Adopt-A-Creek)*
- *Santa Clara Valley Water District*
- *California Department of Fish & Wildlife*
- *California Department of Fish & Game*
- *San Francisco Regional Water Quality Board*

## STRATEGIC PLAN

### Tree Canopy Cover

#### Issues and Trends

- *Mean temperatures will continue to rise due to global warming trends. Increased tree canopy cover will help to moderate these effects.*
- *Regional air quality will continue to be an issue of concern. Tree canopy intercepts air pollutants and reduces both ozone and particulate pollutants.*
- *Tree canopy coverage has increased dramatically over the last 50 years as a result of both new tree planting and growth of native trees.*
- *Many of the planted trees are fairly young and will continue to grow with proper care increasing canopy cover.*
- *Low levels of natural regeneration of native Western sycamores may affect long term sustainability of some stands.*
- *Due to tree placement and species selection, many existing planted trees are unlikely to provide significant shading as trees mature.*

**Goal 1. Establish and maintain target levels of tree canopy throughout the District's Campus and for specific land use categories.**

**Objective 1.1. Establish target levels of tree canopy coverage campus wide.**

**Actions**

- *Adopt an appropriate goal and timetable for achieving canopy cover within the District's Campus.*
- *Establish canopy coverage goals for open space, parking lot, and landscaped areas.*

**Objective 1.2. Maintain or increase tree canopy cover in existing developed areas.**

**Actions**

- *Replant trees as needed in all open space, parking lot, and landscaped areas.*
- *Promote appropriate tree species.*

**Objective 1.3. Increase native tree cover in natural riparian areas located within District's Campus.**

**Actions**

- *Promote natural regeneration by protecting native seedlings from landscape maintenance activities.*
- *Plant natural riparian areas with locally native tree species.*
- *Monitor growth, establishment, and survival of restoration plantings to identify limiting factors.*

**Goal 2. Promote conservation of existing tree resources.**

**Objective 2.1. Improve the management of retained native trees.**

**Actions**

- *Establish a monitoring and maintenance schedule of existing native trees.*

- *Promote good tree care practices on existing native trees.*

**Objective 2.2. Increase the level of protection provided to native trees before and during construction.**

- *Implement tree protection measures and monitoring of native trees to remain during construction activities.*
- *Review and update the District's tree protection guidelines as needed to reduce tree damage during development and to improve long term survival of native trees.*

**Goal 3. Maximize tree related benefits with proper species selection.**

**Objective 3.1. Match species to sites to the greatest degree possible.**

**Actions**

- *Follow guidelines on tree selection and placement to ensure the right tree is planted in the right place.*
- *Select suitable species and appropriate placement to minimize future conflicts.*

**Objective 3.2. Increase the use of large canopy trees where appropriate to maximize tree benefits**

**Actions**

- *Include large stature trees where appropriate to maximize tree benefits and canopy cover.*

**Tree and Forest Health**

**Issues and Trends**

- *Increased genetic diversity will help to reduce the risk of pest and disease outbreaks.*
- *Water conservation will continue to be an issue and should be a top priority in species selection.*
- *Soil conditions should be considered and appropriate tree species will be selected.*

- *Non-native species along the riparian areas will be actively managed to promote the growth and regeneration of native tree species.*
- *The last major development of the District Campus installed 125 trees of the same species in restricted parking lot planting strips. These trees will have similar life spans and will reach the end of their useful life as a group.*

**Goal 4. Maintain Trees in a healthy and safe condition.**

**Objective 4.1. Implement a tree hazard maintenance program to identify and correct tree-related hazards on District properties.**

**Actions**

- *Develop and implement a program for locating and evaluating hazardous trees on District property.*

**Objective 4.2. Follow best management practices for tree planting and care for trees on District property.**

**Actions**

- *Monitor tree health on District property to identify potential pest and disease problems.*
- *Plant good-quality, locally grown, disease free nursery stock to increase survival and tree health. Implement the use of updated tree nursery stock standards and pre- and post-planting inspections by District staff.*
- *Continue use of ANSI pruning standards by District staff and contractors.*
- *Develop and implement standards for improving soil conditions prior to planting to improve survival and tree health.*
- *Assess and remediate site conditions prior to replanting in locations where trees have died.*
- *Do not replant in areas that are deemed unsuitable for planting.*

**Objective 4.3. Encourage the use of best management practices for planting trees on District property.**

**Actions**

- *Continue existing pre- and post-planting inspections by District staff for trees planted on District property.*
- *Make BMP guidelines for tree planting and maintenance available to District staff and contractors to encourage better species selection, planting, and care.*

**Goal 5. Develop a stable urban forest canopy over the long term.**

**Objective 5.1. Avoid excessive use of individual tree species within large plantings and within the District urban forest as a whole.**

**Actions**

- *Establish upper limits for the percentage of the tree population that a single species should comprise. This will limit the damage from pests, diseases, or problems that affect only one variety of tree.*
- *When possible replace trees of different species for overused species when replacing or planting trees.*

**Objective 5.2. Maximize the age diversity of plantings to avoid even-aged stand problems.**

**Actions**

- *In new plantings use a mix of species with varied useful life spans to avoid trees reaching the end of their useful life at the same time.*

**Objective 5.3. Increase the percentage of water conserving trees in the District's urban forest.**

**Actions**

- *Increase compliance with existing policies that encourage the use of water conserving tree species.*
- *Increase the use of locally-native tree species.*
- *Increase the use of water conserving tree species as replacement trees.*

**Objective 5.4. Protect the long-term viability of native riparian tree species on District property.**

**Actions**

- *Use only trees of local genetic stock to conserve genetic integrity of local native tree populations.*
- *Reduce cover of invasive plant species in riparian areas.*
- *Do not use invasive exotic plant species in landscape areas. Maintain a “do not plant” list for landscape review purposes.*

**Management of the Urban Forest**

**Issues and Trends**

- *Many trees on the District Campus are fairly young and in good overall condition. Tree care costs will rise as trees mature.*
- *Once trees mature, more funding will be needed to properly manage the District’s urban forest.*

**Goal 6. Promote efficient and cost-effective management of urban forest resources.**

**Objective 6.1. Develop a systematic approach to inspect and prune trees in an efficient manner.**

**Actions**

- *Develop criteria for inspecting and pruning trees of various species and size classes present on the District Campus.*



- *Inspect and prune young trees as needed to establish good structure to avoid remedial pruning in the future.*
- *Inspect and prune mature trees as needed to maximize cost efficiency. Add tracking of tree care into the tree inventory system when feasible.*

**Objective 6.2. Increase coordination and communication between District departments/divisions whose activities affect the urban forest.**

**Actions**

- *Foster communication and feedback between District staff who deal with tree related planning and maintenance issues.*
- *Review the management plan, tree planting, and maintenance guidelines as necessary.*
- *Develop management plans for maintaining specific sectors of the District's urban forest and update as necessary.*

**Objective 6.3. Develop basic budget information on costs associated with maintaining and caring for the District urban forest.**

**Actions**

- *Track costs associated with maintaining trees to ensure adequate funding is provided.*
- *Prioritize necessary maintenance activities.*
- *Ensure that tree care tasks are allocated to contractors in a cost efficient manner.*

**Goal 7. Foster community support for urban forests and encourage good tree management.**

**Objective 7.1. Institute brochures to educate public about tree selection, placement, and care.**

**Actions**

- *Provide locally appropriate technical tree care information to residents to emphasize*

*good tree selection, placement, optimal planting techniques, proper pruning, and care for native trees.*

- *Disseminate information about appropriate management of the residential/riparian interface to landowners that are adjacent to District facilities.*

*Provide funding for District staff to carry out these objectives. Contract with a local tree non-profit to provide public outreach.*

## **Goals**

- *Adopt the Urban Forest Management Plan to guide long term tree maintenance activities and update it every five years or as deemed necessary.*
- *Maintain, preserve, and conserve established tree canopy cover.*
- *Coordinate all construction activities related to trees with the District Certified Arborist.*
- *Maximize public health benefits.*
- *Provide a proper and safe setting for passive recreation.*
- *Maintain year round beauty.*
- *Provide fish and wildlife habitat.*
- *Prevent soil erosion.*
- *Reduce storm water run-off.*
- *Offer educational opportunities to the public.*

## **Monitoring Plan Effectiveness**

All trees located within the urban forest on Santa Clara Valley Water District's Campus have been assessed as part of the tree assessment survey. It is our primary goal to increase canopy coverage by 21% by the end of 2031 and to maintain a healthy, sustainable urban forest in the most cost effective manner possible. Through careful management of resources this goal will be achieved.

Every year, District staff will re-survey all trees on the District Campus tracking the condition and health to gauge progress. The progress of each tree will be recorded into the Geographic Information System which supplements the on-ground monitoring with a spatial tracking system to help guide work plans and direct resources to where they are most needed. The results of the annual tree survey will allow staff to develop long-term, stable funding to meet management requirements.

Canopy coverage analysis will be conducted every five years or as feasible to determine progress. Since a variety of factors affect how trees grow and survive over time it is important to compare monitoring information that will help indicate which factors were most important for changes seen in canopy coverage over the entire site or specific parts of it.

## **APPENDIX**

### **Ordinances**

The Water District is part of a planned development within the City of San Jose, thus it is restricted to the City of San Jose's Tree Ordinance Policy which specifies tree removal and replacement criteria. The City of San Jose specifies that a permit is required to remove a street tree over 6' in height. For Private Property, a permit is required for trees 56" or larger in trunk circumference measured at 24" above ground. For planned developments, all trees need a permit to be removed and replacement trees are required and are dependent on tree removal.

Trees along the creek are considered to be riparian habitat and are subject to the Stream Maintenance Permit issued by the Department of Water Resources, The Army Corps of Engineers and the U.S. Department of Fish and Wildlife.

The District is currently working on its own comprehensive tree maintenance program with the goal of attaining environmental clearances and permits from regulatory agencies with the ability to mitigate for hazardous tree conditions on District owned facilities in Santa Clara

County, California. The project goals are as follows:

- *Technical coordination with internal stakeholders to develop environmental documents.*
- *Prioritization and planning of assessment work to rate hazards of trees on District Facilities.*
- *Prioritization and planning of hazard mitigation identified in the assessments.*
- *Addressing hazards identified in the assessments through internal or contract resources.*
- *Associated mitigation of impacts from tree maintenance activities (replanting, etc.).*
- *Data management and completion of annual reporting of accomplishments for mitigation commitments.*

## **IMPLEMENTATION PLAN**

The implementation plan sets forth ranking prioritization of goals and objectives for the Santa Clara Valley Water District's Urban Forest Management Plan and specifies budget on an annual basis dependent on potential level of service. The implementation plan will be revised on an annual basis based on adjusted priorities. The implementation plan may occur in phases or span a short time period. Priority rankings are determined in case the budget is inadequate to cover all needed activities.

## Implementation Plan Matrix

Tree Management Planning Tool						
Program Area	Rank For Fiscal Year	Potential Level of Service 1 (minimal)	Potential Level of Service 2	Potential Level of Service 3	Potential Level of Service 4 (optimal)	Staff Recommendation for Fiscal Year
Planting		No new funded tree planting.	Replace only tree removals.	Replace removals and on request.	Replace removals and plant on request, provide for special planting projects.	
Young Tree Care		No young tree care.	5 year cycle inspection and pruning.	3 year cycle inspection and pruning.	1 year cycle inspection and pruning.	
Mature Tree Care		12 year cycle inspection and pruning.	9 year cycle inspection and pruning.	6 year cycle inspection and pruning.	3 year cycle inspection and pruning.	
Hazard Tree Abatement		Removals by request only.	Removals by request, maintain < 5% dead backlog	Removals by request, maintain < 2% dead backlog	Removals by request, maintain < 1% dead backlog	
Administration (2012 Dollars)		\$45.45/tree budget	\$90.90/tree budget	\$136.35/tree budget	\$181.80/tree budget	
Total Budget Impact		\$24,997.50	\$49,995.00	\$74,992.50	\$99,990.00	