Canopy Tree Care Plan

May 1, 2014

Tree Care Subcommittee

Kathy Alford
Marty Deggeller
Susan Ellis
Heather Ellison
Michael Hawkins
Natalia Schoorl

Table of Contents

Canopy Tree Care Plan

1.0 Introduction and Purpose

Post-planting tree care is an essential part of ensuring the long-term success of the trees we plant. In order to guide this important activity, this plan has been developed to provide a structure for performing tree care tasks on designated trees for which we have accepted any level of maintenance responsibility. The intent is that the plan will document tree care policies and plans and will provide information that will be useful in estimating the costs of future tree care activities. It is not intended as a "how-to" guide; procedural methods of implementing the plan should be developed separately.

2.0 Background

Canopy's role in providing tree care services has evolved since the organization was formed. Initially, Canopy solely planted trees along Palo Alto city streets and left all maintenance responsibilities to the City of Palo Alto. Around 2000, Canopy recognized the need to monitor the performance of newly planted trees and began a yearly Young Tree Care Survey that checked the condition of all street trees planted in Palo Alto in the prior five years. While this survey did not involve any hands-on tree care for the trees surveyed, volunteers did record all maintenance actions required and notified the homeowner and the City of Palo Alto of the recommended actions.

In 2006 Canopy received a large grant from the State of California to plant trees in East Palo Alto. One of the conditions of this grant was that all trees planted by the grant be provided with three years of maintenance. The result of this grant was that Canopy planted nearly 1000 along East Palo Alto frontage roads and in street medians. Providing tree care on these trees generated many lessons learned, particularly regarding the large amount of care required. The care of these trees has been compounded by the fact that the City of East Palo Alto did not and still does not have the resources necessary to maintain the trees themselves, so, while technically Canopy's tree maintenance responsibilities ended several years ago, we continue to provide maintenance support.

Subsequent grants received (including other large State of California grants) are enabling us to plant another 1000 trees, this time primarily at schools within the East Palo Alto Ravenswood School District. These grants also carry a three-year maintenance requirement. The School District, like the City of East Palo Alto, has limited resources that they can devote to tree maintenance, so Canopy has the likelihood of facing a difficult time transitioning tree care responsibilities to the School District at the end of our three-year requirement.

This plan addresses some of the guidelines and strategies we will follow in dealing with maintenance transitions such as those described above.

3.0 Tree Care Scope
This section defines the extent of maintenance responsibilities according to the location of the planting performed.

3.1 <u>Palo Alto Street Tree Plantings.</u> After planting, typically, Canopy's responsibilities will be limited to a one-week after planting quality check to make sure the trees were planted properly. From that point, watering will be the responsibility of the City of Palo Alto or the resident, and the City will perform required maintenance activities. There may be exceptions to this policy, such as when the City and Canopy collaborated to prune trees planted on California Avenue.

Note: Canopy will perform an annual Young Tree Care Survey on all street trees planted by Canopy and the City in the past five years, but the City will perform all maintenance actions required.

3.2 <u>Palo Alto Park Plantings.</u> Canopy responsibilities will be limited to performing a one-week quality check and one check during the first summer after planting. Maintenance actions will be the responsibility of the City of Palo Alto.

3.3 <u>Palo Alto School Plantings.</u> Canopy will do scheduled checks (and any associated maintenance), replace failed trees, and prune young trees for three years before handing this responsibility off to the Palo Alto Unified School District. Typically, the School District will install required irrigation for the newly planted trees and will be responsible for all future matters related to irrigation.

3.4 <u>East Palo Alto School Plantings.</u> Canopy will have the full maintenance responsibilities for trees planted at Ravenswood School District sites for three years after planting. These responsibilities are all-inclusive including irrigation, pruning, ground maintenance, tree replacement, etc. Our Memorandum of Understanding with the School District specifies that School District personnel will not do any maintenance of the trees during the three-year period and that Canopy will work with School District maintenance personnel to teach them approved maintenance practices, particularly in regard to tree pruning.

3.5 <u>East Palo Alto Street and Park Plantings.</u> Canopy will do regularly scheduled checks on these plantings, will do routine maintenance, and will prune the trees for the first three years. Irrigation installation (if applicable) and subsequent irrigation actions for any future plantings will be the responsibility of the City.

3.6 <u>Other Plantings.</u> Maintenance responsibilities for plantings that don't fall into the above categories will be determined on a case-by-case basis and will be influenced by grant requirements and resources of the receiving organization.

A table identifying the maintenance actions to be performed for each type of planting is provided in Appendix A.

4.0 Tree Care Elements

Canopy's tree care maintenance activities consist of several elements. The tasks associated with each element will vary according to where the trees are planted and the various agencies involved (refer to Paragraph 3.0), but in general the tree care elements that we need to deal with are: a) tree re-staking and re-strapping; b) tree replacements; c) structural and clearance pruning; d) ground maintenance (specifically weeding around tree wells, berm rebuilding, and mulch replacement); e) irrigation monitoring, adjustment, and maintenance; f) emergency tree care; g) fruit tree maintenance; and h) tree surveys.

(The term "Tree Care" addresses all of the elements that are defined subsequently in this Section. Elsewhere in this plan, we refer to "Tree Care Workdays" and "Tree Pruning Workdays". In this context, "Tree Care" refers to all non-pruning maintenance activities while "Tree Pruning" relates solely to pruning maintenance.)

The following discusses each of these elements in more detail and establishes the policies associated with each action.

4.1 <u>Tree Re-staking and Re-Strapping</u>. These actions are the same as the tasks performed during the planting process. The need for re-staking and re-strapping will be identified during regular site visits or when advised of the need by local tree stewards.

4.2 <u>Tree Replacements</u>. When it is our responsibility to replace a tree, we will typically not replace a "bad-looking" tree until after a new-growth season in order to give the tree a chance to recover from planting trauma. Trees that are clearly dead or damaged through vandalism beyond salvage will be replaced as soon as feasible. (All replacements will be done during the planting season.) Depending on the nature of the problem and the extent of the damage, consideration should be given to "re-growing" the tree from the existing rootstock if there are viable shoots appearing.

4.3 <u>Structural and Clearance Pruning</u>. This challenging maintenance subject is the most complicated of Canopy's tree care tasks. Canopy's approach to this involves developing a cadre of volunteers (and Canopy Youth Staff members) who are trained to perform pruning tasks.

Typically, young trees will be pruned, as required, up to three times during the three-year maintenance period depending on each species growth habits and rate of growth. (See Appendix B for a list of species commonly planted by Canopy and a categorization of their growth rate and recommended pruning time.) Tree pruning events will all be under the supervision of professional arborists. Trees will be pruned in the spring and summer to the extent possible, though this, too, will be species-dependent. Spring/summer pruning also conforms better to Canopy's resource availability and does not conflict with winter tree planting activities.

4.4 <u>Ground Maintenance</u>. Ground maintenance has proven to be a major workload item. In many cases, particularly at schools, trees have been planted in lawn and other areas where weeds and grasses grow quickly and invade the mulched area surrounding each tree. It is important to keep the tree well and nearby area clear to prevent competition from weeds and grasses and to eliminate the need to cut back vegetation with weed-whackers which can cause major injuries to a tree's trunk.

In order to alleviate some of the weed removal workload, it is now Canopy's policy to:
- Do as much weed abatement prior to planting as possible. This could involve chemical treatment of weeds, using mechanical means to clear weeds from the area, or employing other techniques suitable for the planting area. The key element is ensuring an awareness of where we are planting and the long-term potential impact of possible weed encroachment.
- Place weed cloth (the preferred approach) or cardboard around tree wells whenever we plant in lawns or other weed-prone locations. Depending on the planting areas, the weed cloth may also be placed between the trees. The use of weed cloth with thick coverings of mulch should help retard weed growth and water evaporation.

In formulating this policy we recognized that there are water penetration and transpiration issues associated with the use of weed cloth but have concluded that the benefits outweigh any of the slight negatives incurred.

Since ground maintenance tasks are both labor intensive and easily learned, these activities lend themselves well to the use of large volunteer groups. (Large volunteer groups are best-used at large planting sites; Canopy staff and Youth Staff members typically maintain small sites.) Large groups performing ground maintenance can be conveniently supervised with a small number of staff and experienced volunteers and can make a significant impact in a single workday. Ground maintenance activities can be done (and are necessary) throughout the year.

4.5 <u>Irrigation</u>. The key to successful tree establishment is regular and reliable water delivery to each tree. At the same time we recognize the need to use water efficiently and value water conservation. There are two parts to the tree establishment process.

The first involves the protocol for watering the trees starting from the point they are planted. The specifications for how this will be done are contained in Appendix C, "Young Tree Watering". (These instructions have been developed in conjunction with Scott McGilvray of Water Aware.)

The second part deals with the performance of the installed irrigation systems. Several alternative water delivery systems have been used for Canopy plantings including: bubblers or sprayers dedicated to each tree; lawn irrigation without dedicated bubblers/sprayers; hand watering; laser tubing; and DriWater applications. (DriWater is a timed-release water product that is effective where conventional irrigation is too expensive to install. Canopy has used DriWater at several Ravenswood school sites where asphalt cutouts have been used as planting sites.) Tasks associated with the irrigation systems used include:

- Changing DriWater gel-packs on a monthly basis during the summer months and adding supplemental water at the same time.
- Adding supplemental water twice a month to DriWater trees that are not performing well.
- Turning irrigations systems off at the start of winter rains and turning them back at the end of the rainy season.
- Checking that all irrigation heads are functioning. This needs to be done when the systems are turned on for the summer and monitored periodically during the summer.
- Monitoring the quantity of water being delivered to each tree and adjusting the periodicity and watering duration to ensure an adequate quantity of water is being delivered while avoiding excessive water application. (While some current installations have both bubblers and lawn irrigation, the bubblers have been turned off; future plantings will not install bubblers and will rely exclusively on lawn irrigation.) In cases where we are using lawn irrigation only, occasional manual deep-waterings will be scheduled.
- Making sure any trees requiring hand watering are receiving regular, appropriate watering.
- Cleaning irrigation filters periodically to ensure proper water flow.
- Changing batteries periodically in the event battery-operated timers are used for any irrigation installations.

4.6 <u>Emergency Tree Care.</u> While we try to organize tree care activities around scheduled Youth Staff or volunteer workdays, there are situations that require a "quick-response" approach to providing maintenance services. Normally these situations arise when notified of a problem by a tree steward or when observed during a routine check/assessment. Examples of situations requiring immediate attention could include broken stakes resulting in a badly leaning tree, a broken irrigation line, vandalism leading to a broken or badly damaged tree, etc. In these cases the maintenance can't wait until a scheduled tree care workday and will be attended to by staff or senior volunteer personnel.

4.7 <u>Fruit Tree Maintenance.</u> While the vast majority of the trees we plant are shade trees, we have in recent years incorporated some fruit trees into school plantings in East Palo Alto. In addition to the general tree care responsibilities described above, fruit trees have some additional maintenance needs relating to fertilization, pruning, and harvesting. In support of this we will fertilize fruit trees every 6-8 weeks and will coordinate with Collective Roots (or other urban

gardening organizations) to coordinate pruning and harvesting activities. Our tree pruning workshops only address shade trees and fruit trees have very species-dependent pruning techniques that are unfamiliar to our volunteers. Therefore, we will look to Collective Roots to take care of pruning and harvesting tasks.

The citrus and avocado trees we have planted require some extra attention during periods of cold weather. Depending on temperature forecasts we will, when necessary, take steps to minimize frost-damage through use of CloudCover or other protective means.

4.8 <u>Tree Surveys.</u> Surveying newly planted trees is an effective way of systematically determining required maintenance activities. We will do these surveys on a scheduled basis and may take care of minor maintenance actions at the same time. If maintenance requirements are greater than can be performed during the survey, we will schedule a maintenance workday or notify the responsible maintenance organization.

4.9 <u>Fee-for-Service Maintenance.</u> Currently Canopy does not perform any fee-for-service maintenance activities. However, this may be an area that holds potential as a source of additional funding for the organization. Specific examples of fee-for-service work could include maintenance contracts with the Palo Alto Unified School District, the City of East Palo Alto, the Ravenswood School District, or other agencies. At this point we have decided to consider any fee-for-service opportunity individually and to evaluate the impact to the organization.

5.0 Tree Care Resources

Overall resources used by Canopy to conduct maintenance activities consist of the following categories of people:

- Staff – Staff resources consist primarily of the Program Director and the Program Coordinator who is responsible for all of Canopy's tree care activities. The Program Director is an ISA-certified arborist and both individuals are professionally experienced in tree planting, pruning, and all aspects of tree care. They regularly lead volunteers in performing planting, pruning, and other tree care activities. Depending on the nature of the project, other staff members may participate, as needed.
- Youth Staff – The Canopy Youth Staff currently consists of four Eastside Prep students who work regularly on Thursdays after school and on Saturdays as required. Their duties include supporting planting, tree care, pruning, and special events. They are trained in tree planting, pruning, all other aspects of tree care, and leadership and are capable of directing untrained volunteers to plant and care for trees.
- Trained Volunteers – These are volunteers who have completed Canopy's tree pruning workshop or have participated in several tree care events and are familiar with the tree care protocols that we follow. These individuals are capable of directing untrained volunteers to do routine tree care work but who, in general, would not direct tree-pruning volunteers.
- Untrained Volunteers – These volunteers comprise the largest portion of Canopy's volunteer resources and often are one-time volunteers who participate in an event as part of a large volunteer group. With supervision, these volunteers are generally capable of doing routine tree care activities but would not be entrusted with tree pruning responsibilities.
- Site Stewards - Whenever possible, we will identify local contacts to act as stewards for the newly planted trees. The steward will be responsible for periodically checking the health and status of assigned trees and reporting any problems to Canopy. Canopy will provide a packet of information that will include a list of expectations and tasks that will be performed by the steward and by Canopy. The site stewards are an important part of Canopy's ability to respond to problems that might otherwise be undiscovered until our next planned inspection at the site.
- Professional Arborists – Canopy is fortunate to have excellent relationships with many arborists in the area and relies on them to provide guidance to our trained pruning volunteers during pruning workdays.

6.0 Tree Care Program Implementation
This section addresses our general approach to tree care and identifies several elements necessary to provide a successful tree care program.

The Tree Care Subcommittee has reviewed the volume of current workload and believes that the approach below is an effective one to meet current obligations. However, we also believe that a meaningful future risk of tree care lies with the volume of pruning we may face in the next few years. Pruning, unlike other tree care tasks, cannot be done by untrained volunteers. Even trained volunteers remain inexperienced and need guidance from professional arborists. This severely limits the amount of pruning maintenance that staff and volunteers can reasonably perform. We will be adding a significant number of trees during this planting season and, combined with existing pruning responsibilities, we need to continue to monitor the workload. The Subcommittee will review workload periodically and make recommendations should the requirements grow beyond current capabilities. One future option to consider is the possibility of contracting some of the pruning to outside sources. Other aspects of tree care, particularly irrigation responsibilities, are also candidates for contracting.

6.1 <u>Staff, Volunteer, and Professional Resources.</u> Staff (including youth staff) and volunteer personnel augmented with professional arborists (for pruning activities only) will be used to conduct tree care activities. The youth staff is an important part of tree care as all have been trained in all tree care tasks including pruning. Future members of the youth staff will continue to go through all phases of tree care training.

6.2 <u>Shade Tree Pruning Training Workshops.</u> In order to train a sufficient cadre of trained pruning volunteers we will continue to offer (once or twice a year) tree pruning training workshops led by professional arborists. These workshops have a classroom segment followed by a fieldwork segment designed to give each student the opportunity to do some hands-on pruning experience. Students in the tree pruning training workshops also have the responsibility to participate in at least two subsequent pruning workdays where they will gain more experience that will help reinforce their skills. Hopefully, these participants will then choose to continue to work with Canopy in the future.

The pruning guide that Canopy has adopted is "Structural Pruning: A Guide for the Green Industry" by Brian Kempf et al.

6.3 <u>Fruit Tree Pruning Workshops.</u> Because fruit tree pruning is highly species-dependent and significantly different than shade tree pruning, we will conduct periodic fruit tree pruning workshops for interested community members. The goal of these workshops is to attract a sufficient contingent of participants so that under the supervision of a certified arborist the cadre could over the course of the workshop prune the complement of fruit trees at the training site.

6.4 Regular Tree Pruning Workdays. Whenever possible we will have professional arborists participate in these events as they are useful to provide technical advice and direction during the sessions. These workdays also have the benefit of providing additional hands-on opportunities for tree pruning training workshop graduates, youth staff, and personnel from EPA and School District maintenance staffs.

6.5 Regular Tree Care Workdays. These workdays will focus on non-pruning activities such as ground maintenance. As noted previously these events can effectively use large numbers of volunteers without prior experience. Experienced tree care leaders provide on-the-job training to volunteers who participate in these events.

6.6 Young Tree Care Survey (YTCS). Each summer, Canopy uses community volunteers to conduct a survey of all Palo Alto street trees planted in the past five years. This survey addresses the health of each tree and identifies maintenance actions required. (Minor maintenance tasks such as weed or sucker removal may be done at the time of the survey.) The results of the survey are compiled and provided in a report to the City of Palo Alto, which is responsible for taking action on the recommended maintenance activities.

6.7 Tree Care Priority Management. Once each quarter, the Tree Care Subcommittee will review the status of tree care at each site and determine priorities as well as assessing workload and resources.

7.0 Tree Care Schedule
Appendix D contains a generic tree checkup schedule that Canopy will use to guide required maintenance actions. This schedule addresses the general timeframe for doing tree checkups and prunings and does not represent the actual number of visits that may be made to a given site. The number of visits will be site-dependent based on the findings of each checkup. We will create a site-specific schedule for each planting location and will use those detailed schedules to schedule workdays and other required actions, and to coordinate overall tree care activities.

8.0 Transitioning Tree Care

As mentioned previously, Canopy faces the challenge of transitioning tree care responsibilities in East Palo Alto at the end of our contractually required three-year period to the agencies for which the trees were planted. Some conclusions and comments on this subject are identified below.

- It is in Canopy's best interest to try to prepare the agencies to assume responsibility for the maintenance tasks at the end of our contractual obligation. To this end we will:
  - Conduct periodic maintenance clinics stressing proper pruning techniques
  - Conduct collaborative workdays when maintenance personnel can work alongside and learn from professional arborists
  - Provide technical and instructive documentation on tree maintenance issues
  - Set up regular meetings with the agencies to review any issues they have and respond to reinforce actions they should be taking
  - Seek out professional tree care companies who may be willing to do occasional tree care projects on a pro bono basis.
- Canopy and the communities we serve have a vested interest in ensuring the long-term success of our plantings. Because of the shortage of City and School District maintenance resources in East Palo Alto, we will continue to monitor plantings beyond the first three years, will assist in maintenance tasks when time and resources permit, and will act in an advisory capacity by recommending courses of action that the responsible party should take. By the end of our three-year maintenance responsibilities, all stakes should have been removed, watering basins will no longer be necessary, irrigation should no longer be required in most cases, and the responsible party should assume responsibility for ground maintenance actions. The primary on-going maintenance work will involve pruning the trees. We may become involved in some continuing pruning work in East Palo Alto either through a maintenance contract or if we have resources available and feel that it would be to Canopy's and the community's benefit to do some continued pruning. There are limitations, however, to the pruning actions we can take. As the trees mature, the size and spread of the trees will eventually be beyond our capability to prune and professional tree care resources will be needed. In the case of both the City of East Palo Alto and the Ravenswood School District, neither currently has the resources to be able to properly maintain mature trees and efforts should be made to have both entities budget funds to contract the tree care work to professional companies or otherwise build their capacity.

9.0 Other Considerations

9.1 <u>Tree Tagging.</u> Each tree planted by Canopy should have an associated tree tag and each tag should be affixed to the tree or tree stake in some manner. The tree tag will contain the following information at a minimum:

- A unique number
- Tree species
- Date planted
- Canopy information including logo, website, and phone number

The unique number will be keyed to the site map that is developed for each planting. This approach will help both the local tree steward and Canopy/agency maintenance personnel to identify and report on trees requiring maintenance actions. In addition the tag will provide visibility of Canopy as an organization and will be informational to the general public who may have curiosity about the newly planted trees. At this point we are still investigating tree-tagging options and no recommended approach has been identified.

As our initial test case, we developed tree tags for the 12/7/2013 planting on Ralmar Avenue in East Palo Alto. These tags were prepared in the Canopy office, laminated, and affixed to each tree using a zip tie. Each tag contains all the minimum information identified above and is printed in Spanish on the backside of the tag. We will monitor and evaluate the durability of these tags.

9.2 <u>Data Collection/Record Keeping.</u> Currently, records of tree care activities are kept manually and then entered into the Canopy Gaia database. However, the Corporate Asian-American Employee Network (CAAEN) has volunteered to develop a field data collection system using Microsoft Surface tablet computers as the data entry device. The specifications of this system are still to be developed but we envision being able to use the devices to enter field maintenance information on a tree-by-tree basis and to remotely transmit the data to a tree database that will contain all relevant information about each tree we maintain.

In addition there is the potential to use a Davey Resource Group capability for field data collection. This approach may prove to be a preferred method, particularly for the Young Tree Care Survey, because the collection process could interface directly with the City of Palo Alto's TreeKeeper system.

9.3 <u>Tree Mapping.</u> Another desirable capability is to be able to map the location of each tree we plant. This capability will enable us to accurately identify and communicate location information about any tree requiring maintenance. This is particularly useful if the trees have no other unique identification (such as a tree tag). CAAEN has also indicated they will look at the ability to integrate this capability into the data collection system mentioned above.

Appendix A
Maintenance Responsibilities By Planting Location

Maintenance Action	PA Streets	PA Parks	PA Schools	EPA Schools	EPA Streets/ Parks	Other
Post-Planting Check	X	X	X	X	X	*
One-Month Check			X	X	X	*
Three – Month Check			X	X	X	*
Six to Nine-Month Check		X	X	X	X	*
One-Year Check	X**		X	X	X	*
One-year Pruning			X	X	X	*
Two-Year Pruning			X	X	X	*
Three-Year Pruning			X	X	X	*
Tree Care Work Days			X	X	X	*
Pruning Work Days			X	X	X	*
Irrigation Checks				X		*
Emergency Tree Care			X	X	X	*
Fruit Tree Maintenance				X		*

* All actions are dependent on the type of planting and grant requirements
** Done through the annual Young Tree Care Survey (done annually for five years)

Appendix B
Optimal Pruning Season and Growth Rate by Species

Species	Spring	Summer	Fall	Winter	Growth Rate
Abbreviations: F = fast M = moderate S = slow X = primary (x) = optional					
Ornamental Trees					
Acer buergerianum Trident maple		X little req'd		(x)	M
Acer x *freemanii* 'Autumn Blaze' Autumn Blaze Maple		X		(x)	M→F
Acer rubrum Red Maple		X		(x)	F
Afrocarpus falcatus (SYN: *Podocarpus gracilior*) Fern Pine		X little req'd			M
Arbutus 'Marina' Marina Strawberry Tree	X	(x)			M
Arbutus unedo Strawberry Tree	X little req'd	(x) little req'd			S
Cupressus sempervirens Italian Cypress	X little req'd	(x)			S→M
Eucalyptus nicholii Nichol's Gum		X			F
Eucalyptus spathulata Swamp Mallee		X			M→F
Fraxinus uhdei Evergreen / Shamel Ash		X	(x)		F
Lagerstroemia 'Muskogee' *Lagerstroemia* 'Natchez' Crape Myrtle		X after bloom	(x)		S
Lophostemon confertus *L. confertus* 'Elegans' (SYN: *Tristania conferta*) Brisbane Box		X	(x)	(x)	M
Magnolia x *soulangeana* Saucer Magnolia	X after bloom	(x)			M
Olea europaea *Olea europaea ssp. cuspidata* European / African Olive	X	X		(x)	M
Parrotia persica Persian Ironwood		X little req'd	(x)	(x)	S
Pistacia chinensis Chinese Pistache		X	(x)		M
Platanus x *hispanica* [1] (SYN: *Platanus* x *acerifolia*) London Plane		X	(x)		F

Species	Spring	Summer	Fall	Winter	Growth Rate
Abbreviations: F = fast M = moderate S = slow X = primary (x) = optional					
Prunus ilicifolia ssp. *lyonii* Catalina Cherry`	X little req'd	(x) little req'd			M
Pyrus calleryana [2] Flowering Pear		X	(x)		M→F
Quercus agrifolia Coast Live Oak		X			M
Quercus frainetto 'Forest Green' Forest Green Oak		X	(x)	(x)	M
Quercus lobata Valley Oak			(x)	X	M
Quercus rubra Red Oak		X	(x)	(X)	F
Quercus suber Cork Oak		X	(x)	(x)	S
Quercus virginiana 'Cathedral' Cathedral Southern Live Oak		X			M→F
Tilia tomentosa 'Sterling' Silver Linden		X little req'd		(x)	F
Ulmus parvifolia 'Drake' Drake Chinese Elm		X	(x)	(x)	F
Ulmus parvifolia 'UPMTF' Bosque Chinese Elm		X	(x)	(x)	F
Zelkova serrata Sawleaf Zelkova		X	(x)	(x)	M→F
Fruit Trees [i]					
Citrus sp. Orange, Lemon, Tangerine	X [3]	X [3]			M→F
Casimiroa edulis White Sapote	X [3] pinch terminal buds	X [3] pinch terminal buds	(x)		M
Malus domestica Apple	[3]	X	(x)	(x)	M
Olea europaea *Olea europaea* ssp. *cuspidata* European / African Olive	X	X [4]	[4]	(x)	M
Persea americana Avocado	X [3]	X [3]			F

1. Remove diseased limbs year round, as needed (powdery mildew, anthracnose)

2. Remove diseased limbs year round, as needed (fireblight).

3. Fruit trees should also be fertilized 2-3 times during growing season (April ➔ September).

4. Monitor for olive fruit fly (late summer ➔ early fall) ~ preventative organic treatment includes spraying with BT.

Appendix C
Young Tree Watering
(Tree Establishment Instructions)

The following are guidelines for establishing trees primarily planted from #15 size containers between the months of October and March in the San Francisco mid-peninsula area.

Tree care starts at planting
- Always plant quality nursery stock using current best planting practices. Refer to the *Guideline Specifications for Nursery Tree* Quality (http://ufei.calpoly.edu/files/pubs/NurseryTreeSpecs10_13.pdf) published by the Urban Tree Foundation, and current Canopy Planting Instructions and ANSI A300 Standards Part 6 (http://tcia.org/business/ansi-a300-standards/part-6) for tree planting. Proper planting height and root preparation is particularly important.
- Watering basins should be built to hold enough water (ideally 3-5 gallons) and lead directly into the outer edge of the rootball. Many basins are built too wide and too low.
- Apply 4 to 6 inches of mulch 1 inch away from the trunk and around the entire drip line of the tree(s) to help retain moisture and insulate roots from extreme temperatures.
- Climate appropriate, drought tolerant species appropriate for dry summers and occasional frosts are highly recommended.
- Soil texture, site conditions, and fluctuating temperatures all must be taken into account to properly use the following information.

8 Fairly Simple Steps to Proper Tree Establishment
1) **At planting**, fill the watering basin 3 separate times. Use buckets, a hose, or watering cans. Apply approximately **10 to 15 gallons of water**.
2) **3 days later**, fill the watering basin again (**with 5-10 gallons**). The water applied at time of planting will have dispersed into the surrounding soil, and away from the rootball, where it is most needed at this most critical period.
3) Fill the watering basin **once a week for the next 3 weeks** to finish out the first month.
4) **Between 30 and 60 days after planting**, move to an **every other week** schedule for the following **6 months** or until the end of the growing season (mid-November). Roots need oxygen just as much as they need water and conservation at this stage will actually help your tree(s) grow.
5) Monitor dry spells during the first winter. Water any frost intolerant tree before a cold spell to help insulate roots.

6) In the **second year**, soak trees when spring dries the soil out, then **every 14 to 30 days** depending on the species. Allow the roots to seek out moisture deeper underground and further from the trunk. Shallow watering leads to shallow rooting and water dependency. Deeper, infrequent watering will lead to resilient trees with less impactful roots.

7) Over the **next two summers** experiment with decreasing frequency and increasing duration and coverage even more. **Monthly soakings** should maximize growth while conserving water. Many irrigation timers actually have a setting for monthly watering. You can also set several start times 15 to 30 minutes apart to decrease runoff and improve soil penetration.

8) In the **following few years**, be wary of prolonged dry periods. **One or two summer waterings** can mean the difference between a tree that thrives and one that is permanently stunted. **Between 3 and 5 years** you shouldn't have to supply any supplemental water for your drought-tolerant tree to do well.

Appendix D
Tree Care Checkup and Pruning Schedule

CHECKUP SCHEDULE	WORK DONE AT CHECKUP	CANOPY WORKDAYS
Post-planting checkup (about one week after planting)	• Tree by tree quality control checkup • Irrigation check • Any cleanup required	
1 month after planting	• General health assessment • Emergency staking, pruning, and vandalism checkup	
3 months after planting*	• General checkup • Notify Canopy of any tree care needed	• If needed, schedule tree care work day(s) with volunteers or Youth Staff
6-9 months after planting	• General checkup • Assess if tree care work day is needed	• If needed, schedule tree care work day(s) with volunteers or Youth Staff
1 year checkup*	• General checkup • Notify Canopy of any tree care needed	• If needed, schedule tree care work day(s) with volunteers or Youth Staff
1 year pruning**	• First structural pruning • Health assessment • Weeding and mulching as needed	• Pruning workday(s) • General maintenance workday(s) if needed
2 year pruning**	• Second structural pruning • Health assessment • Weeding and mulching as needed	• Pruning workday(s) • General maintenance workday(s) if needed
3 year pruning**	• Third structural pruning • Health assessment • Weeding and mulching as needed	• Pruning workday(s) • General maintenance workday(s) if needed

* Conducted by Site Steward

** Pruning frequency will be determined by rate of growth