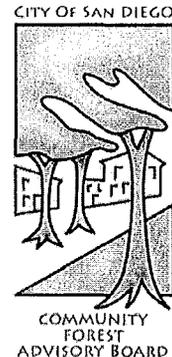


COMMUNITY FOREST ADVISORY BOARD

CITY OF SAN DIEGO



May 13, 2013

Mr. Glen Schmidt, Chair
Water Implementation Policy Task Force
City of San Diego

Dear Mr. Schmidt:

Thank you for the opportunity to provide comments on the Water Implementation Task Force draft recommendations. This letter provides specific requested changes in these recommendations, as well as background information on the benefits of trees.

Suggested revisions to March 25, 2013 recommendations of Task Force

Please consider the following changes, with additions marked in italics.

Conservation Working Group

2. To strengthen the code and to encourage more water conserving landscapes in new construction, modify the water conservation code requirement for new landscape construction as follows:
 - d. INSERT: *Incorporate low- and moderate-water-use trees to maximize benefits of shade, walkability, property value enhancements, and other public benefits.*
4. Implement permanent and ongoing water conservation and outreach program. We recommend that City leaders, elected officials and others take on the responsibility of helping to create a city wide water conservation ethic.
 - INSERT: *Consider and account for the long-term benefits of trees in shade, reduced heating and cooling requirements, stormwater management, groundwater recharge, and carbon sequestration.*
6. Labeling Programs: In coordination with the San Diego County Water Authority, consider implementing an outreach and education program that concentrates on home improvement stores and nurseries in the region. Evaluate programs for labeling water conserving

products, especially in the landscape industry, such as labeling drought tolerant plant materials *and water requirements for establishing and maintaining trees.*

7. Landscape Conversion Programs: Explore the possibility of expanding “Cash for Grass” *and tree-planting* programs to effect real change in the landscape.

Water Recycling Working Group, Stormwater Recommendations:

4. Explore opportunities to develop a low impact development (LID) “Demonstration Project” in an area with high public traffic and access, such as Balboa Park that would reduce run-off and also serve to educate the public. Alternatively, the City could pursue a “green streets” project, like the one in Los Angeles which produces multiple benefits and serves as demonstration site as well. *Incorporate trees into these demonstration projects, to get additional benefits of shade, reduced heating and cooling requirements, stormwater management, and carbon sequestration.*
5. The Stormwater Department should develop a new program that achieves two goals.
 - b. Provide incentives, such as a fee reduction, to property owner’s of new and existing development to maximize the use of low impact development methodologies such as pervious pavement, grass rooftops, rain gardens, *trees*, etc. to minimize stormwater run-off.

Benefits of trees

San Diegans’ quality of life depend on the urban forest, as trees make a vital and affordable contribution to sense of community, walkable neighborhoods, energy savings, air quality, and more. The urban forestry program is critical to meeting the City’s commitment to climate change, carbon sequestration, stormwater reduction, and water conservation. Trees are one of the few infrastructure investments that grow in value with time. The following are from the review of benefits of trees and urban forests by Alliance for Community Trees,¹ which cited 122 references; the footnotes refer to references in the review.

Trees save Energy . . . and lower the cost of cooling and heating buildings

As natural screens, trees can insulate homes and businesses against the elements, hot or cold. Properly chosen, sited and nurtured, shade trees keep properties cool and reduce air conditioning utility bills. A 20% tree canopy over a house results in annual cooling savings of 8-18% and annual heating savings of 2-8%.² By planting shade trees on sunny exposures, residents and businesses can save up to 50% on hot-day energy bills.³ In addition to the shade,

¹ Alliance for Community Trees. 2011. Benefits of trees and urban forests: A research list. Unpublished white paper, 19 pp. Available at http://www.actrees.org/files/Research/benefits_of_trees.pdf

² Alliance For Community Trees 2011, reference 13

³ Alliance For Community Trees 2011, reference 91

transpiration (water cycling through the tree and out the leaves) creates a cooling effect. As a bonus, tree cover insulates against rain, wind and cold temperatures. Ultimately, denser tree canopy also diminishes local electricity demands and lowers national energy dependence.

Trees Clean Water . . . and conserve water and soil

A tree's fibrous roots, extending into the soil, are nature's best pollution filtration system and they prevent erosion. In 2002, over 39% of San Diego was covered with impermeable surfaces.⁴ Pollutants from yards, automobiles, and businesses flow unfiltered over impermeable surfaces to our streams, bays, beaches, and oceans, threatening our water, our health, and our pocketbooks. In contrast to impervious hardscape, a healthy urban forest can reduce annual stormwater runoff up to 7%.⁵ Highly efficient trees also utilize or absorb toxic substances such as lead, zinc, copper and biological contaminants.⁶ Expanding tree cover from 13%, estimated in 2002, to 25% would provide a one-time savings for avoiding construction of stormwater retention systems, valued at approximately \$214 million.⁷ One study estimated that eliminating the need for additional stormwater filtration systems would result in savings exceeding \$2 billion.⁸

Trees can help retain local precipitation. Trees reduce the velocity of rainfall thus allowing percolation into the soil and reduction of runoff; stabilizing the soil with intricate root systems to prevent erosion and retain soil moisture; utilizing nutrients in runoff; and shading surfaces to reduce evaporation. This results in cleaner urban runoff reaching our streams, reservoirs, bays, and beaches and recharges the groundwater supply beneath our city.

Trees Positively Influence Climate . . . and secure San Diego's sustainability

Increasing tree cover absorbs carbon and reduces global greenhouse gases. Cars, trucks, industries, and power plants in our busy city produce carbon emissions as they burn fossil fuels. Carbon emissions are a primary contributor to increased air temperatures in metropolitan areas, because they slow the passage of heat through the Earth's atmosphere. Urban trees in the U.S. store 700 million tons of carbon valued at \$14 billion with an annual carbon sequestration rate of 22.8 million tons per year valued at \$460 million annually.⁹

Further guidance and information.

Guidance for watering trees has been prepared by the Vacaville Tree Foundation¹⁰ and the San Diego Regional Urban Forests Council.¹¹ Both are appended to this letter.

⁴ American Forests 2003

⁵ Alliance For Community Trees, 2011, reference 10

⁶ Alliance For Community Trees, 2011, reference 19

⁷ American Forests 2003

⁸ *San Diego Canyon Policy Portfolio*, 2006, Preamble, Ecosystem Services Analysis.

⁹ Alliance For Community Trees 2011, reference 52

¹⁰ Vacaville Tree Foundation. Undated. Watering your tree. 1 p. Available at <http://phytosphere.com/vtf/>.

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Thank you for this opportunity to provide suggestions to strengthen the Water Implementation Policy Task Force. Trees require surprisingly little water during and after establishment, and provide so many benefits to City residents and visitors in the form of shade, walkability, property value enhancements, reduced heating and cooling requirements, stormwater retention, and carbon sequestration. Please contact me for clarification and further information.

Sincerely,

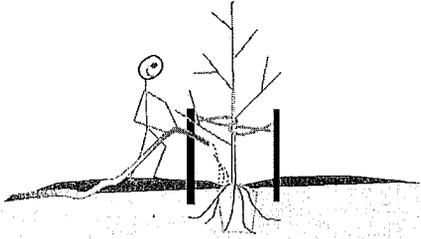


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cc: CFAB Board, and City staff

¹¹ San Diego Regional Urban Forests Council. Undated. Water-wise tree care for the San Diego region. 1 p. Available at <http://www.caufc.org/documents/sdwaterwise.pdf>.

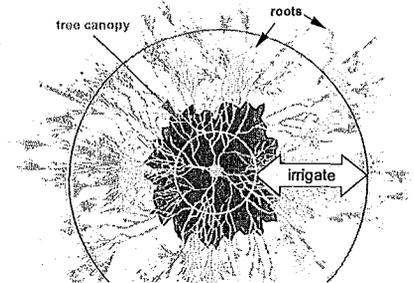
Where to irrigate



or drip line. Water in the outer half of the area under the canopy and beyond the edge of the canopy. ⇨

☛ **Newly planted trees:** Until new roots grow into the soil of the planting site, water the original root ball area and just beyond this area. The root ball area may dry out faster than the surrounding soil. A newly planted tree may take 1-2 years to become established. Larger container stock trees may take longer to become established than smaller stock.

☛ **Established trees:** Don't irrigate the area directly adjacent to the trunk - this can increase the risk of disease. Roots extend far beyond the edge of canopy



How to irrigate

You can apply water effectively using sprinklers, drip irrigation, or a hose running on the soil surface. Regardless of how you apply the water, follow these basic rules.

◆ **Water deeply rather than frequently.** Because most tree roots are found in the upper 18 - 24 inches of the soil, this is the zone that should be wetted up in each irrigation cycle. Each deep irrigation will meet a tree's water needs for between 10 days to 4 weeks during the hottest part of the summer, depending on the tree species and soil type.

◆ **Stop watering when runoff starts.** Soils high in clay accept water slowly, often as little as 1/4 inch per hour. Water infiltration is especially slow in compacted soils. If water starts to pool or run off, stop irrigating, let the water soak in, and start watering again. Repeat on/off cycles until you apply enough water to wet the soil to 18-24 inches. This may take a number of cycles over several consecutive days.

◆ **Don't saturate the soil for long periods.** Water displaces air in the soil, so long periods of soil saturation can suffocate growing roots. Take a long enough break between irrigation cycles to allow the free water to be absorbed. If in doubt, probe or dig to make sure that the soil isn't soggy below the surface.

How much water does my tree need?

Tree irrigation needs change over time. The amount of irrigation your tree will need can be affected by:

◆ **Tree age** - A newly planted tree will need more frequent irrigation than an established tree because its root system is more limited.

◆ **Root damage** - An established tree that suffers root loss or damage (for instance, due to trenching within the root zone) may need additional irrigation until new roots grow to replace those that are destroyed.

◆ **Time of the year** - The need for irrigation is greatest in mid to late summer, when temperatures are the highest and most of the moisture stored in the soil over the winter has been depleted.

◆ **Weather conditions** - In drought years, soil moisture is used up earlier in the season, so the period of peak water need is longer. Some trees that do not normally need irrigation may benefit from irrigation in drought years. In very wet years, irrigation may not be needed until early summer.

◆ **Soil conditions** - Water used by trees is stored in the soil. Soil type, depth, and condition influence how much water can be stored in the soil, and consequently how often you may need to water. Soils that have more clay hold more water and can be irrigated less frequently. Sandy soils hold relatively little water and need more frequent irrigation.

◆ **Species** - Some tree species require no additional irrigation once established, whereas others will do poorly without consistent irrigation throughout the summer.

Water requirements of established trees under and typical Vacaville weather conditions and soils

Category	Summer watering interval*	Tree species	
Low	once per month	☛ Chinese pistache (<i>Pistachia chinensis</i>)** ☛ Crape myrtle (<i>Lagerstroemia indica</i>)** ♣ Deodar cedar (<i>Cedrus deodara</i>)**	☛ Hackberry - (<i>Celtis</i> species) ☛ Japanese pagoda tree (<i>Sophora japonica</i>)**
Moderate	twice per month	☛ Chinese flame tree (<i>Koelreuteria bipinnata</i>) ☛ Hedge maple (<i>Acer campestre</i>) ☛ Flowering Pear (<i>Pyrus calleryana</i> cultivars including 'Aristocrat'**)	♣ Incense cedar (<i>Calocedrus decurrens</i>) ☛ London Plane tree (<i>Platanus acerifolia</i>)** ☛ Stone fruits - apricot, cherry, peach, plum, nectarine (<i>Prunus</i> species)
High	three times per month	♣ Coast redwood (<i>Sequoia sempervirens</i>)**	☛ Birch (<i>Betula</i> species)

* assumes that soil in the root zone is wetted to a depth of 18 to 24 inches at each irrigation

** species included in the Vacaville Trees 2000 residential tree giveaway program



WATER-WISE TREE CARE FOR THE SAN DIEGO REGION

PUBLISHED BY THE SAN DIEGO REGIONAL URBAN FORESTS COUNCIL

WHY SHOULD I WATER MY TREES?

- Trees are a vital part of your landscaping. They provide numerous economic, environmental, and social benefits. They are also the most expensive element of your landscape in terms of investment and time. A tree that dies can take 20 years or more to replace.
- According to The National Arbor Day Foundation, the presence of properly planted and maintained trees can increase a home's resale value by as much as 15%.
- Tree canopies intercept rain fall, increasing storm water retention.
- Trees provide shade to walkways, parks, and buildings, reducing energy costs.
- Trees improve air quality by removing pollutants. Two mature trees produce enough oxygen for a family of four for one year.
- Trees also conserve water through saving energy; power plants are one of the highest consumers of water in our region.

HOW MUCH WATER DO MY TREES NEED?

- The species of tree, age of tree and type of soil influence how much water the tree needs. Some types of soil hold water longer than others, and watering young trees is different from water mature trees.
- For new trees: Approximately 5-10 gallons of water weekly is adequate depending on weather conditions. Also you can build a 4 inch high circular ring of soil around the root ball (usually 18-24 inches away from the trunk is sufficient) to contain the water.
- For well-established, mature trees: Water when the top 6in of soil around the tree has dried out. Mature trees should receive water in several places around the tree at least half way between the trunk and edge of the tree canopy (drip line). Water using either a slow dripping hose or drip irrigation and do not allow water to run off.
- **Note – If you are removing or not watering turf grass, don't forget your trees still need water.**

HOW DO I WATER MY TREES AND STILL CONSERVE WATER?

- Slow, infrequent, deep soaking. Water supply rate should not exceed water absorption (do not allow water to run off).
- Convert existing systems to drip, low flow bubble heads, or micro spray systems for shrubs and trees, not standard spray heads. Trees should be irrigated separately from turf and landscaping as water needs vary.
- Repair existing irrigation system, fix leaks. Inspect system annually to clear emitters and ensure proper operation.
- Include rain sensors and automatic shutoff valves for irrigation controls or manually shut off water during / after rain.
- To test if your soil has enough moisture, take a handful of soil and squeeze it tightly, then release the pressure. If the soil retains its shape, there is adequate moisture in the soil and you do not need to water. If it crumbles and falls apart, you need to water. If it oozes water, the moisture content is too high.

HOW ELSE CAN I CONSERVE WATER?

- Mulch, Mulch, Mulch! Proper mulching techniques will significantly reduce water evaporation.
- Important! Keep mulch 4-6 inches away from the tree trunk. Mulch should be placed 2-4 inches deep around the tree and out to the edge of the canopy. Organic mulch such as wood chips should be used to keep soil temperatures lower.
- Mulching is one of the easiest ways to save water and promote healthy root systems. Proper mulching helps maximize water conservation in hot weather and further increases storm water retention.
- During severe drought, water only enough to sustain the tree rather than providing excess water to promote growth.

TEN DROUGHT TOLERANT TREES AND ANNUAL ENVIRONMENTAL BENEFITS WHEN MATURE

- If planting new trees under overhead power lines, make sure the trees are compatible (less than 25 feet at maturity) and always plant the right tree in the right place.
- The benefit values below are approximations based on mature trees using the National Tree Benefit Calculator.

Tree	Scientific Name	Storm Water Intercepted (gal)	Energy Savings (Kw Hrs)	Carbon Stored (lbs)
Australian Willow	<i>Geijera parviflora</i>	324	27	9
California Sycamore	<i>Platanus racemosa</i>	1260	124	149
Canary Island Pine	<i>Pinus canariensis</i>	812	66	137
Crape Myrtle	<i>Lagerstroemia indica</i>	320	42	12
Jacaranda	<i>Jacaranda mimosifolia</i>	375	49	10
Melaleuca (paper bark)	<i>Melaleuca linariifolia</i>	324	27	9
Coast Live Oak	<i>Quercus agrifolia</i>	598	53	246
Peppermint tree	<i>Agonis flexuosa</i>	324	27	9
Western Redbud	<i>Cercis occidentalis</i>	320	42	12
Torrey Pine	<i>Pinus torreyana</i>	1094	99	178

FOR MORE INFORMATION:

SelectTree – <http://www.selecttree.com>

Calif. Urban Forest Council – <http://www.caufc.org>

Arbor Day Foundation – <http://www.arborday.org>

Tree Benefit Calculator - <http://www.treebenefits.com>

SDG&E Tree Safety Website – <http://sdge.com/safety/treesafety>

City of San Diego Water Department - <http://www.sandiego.gov/water>

San Diego County Water Authority – <http://www.sdcpwa.org>

Landscape Watering Calculator - <http://apps.sandiego.gov/landcalc/start.do>