

A close-up photograph of an oak tree branch. The leaves are in various stages of autumn, with some still green and others turning bright orange and red. Several green acorns are visible, some still attached to their caps. The background is a soft-focus green, suggesting more foliage.

# Trees: Sustainable Development with New and Heritage Trees

Sustainable by Design Seminar

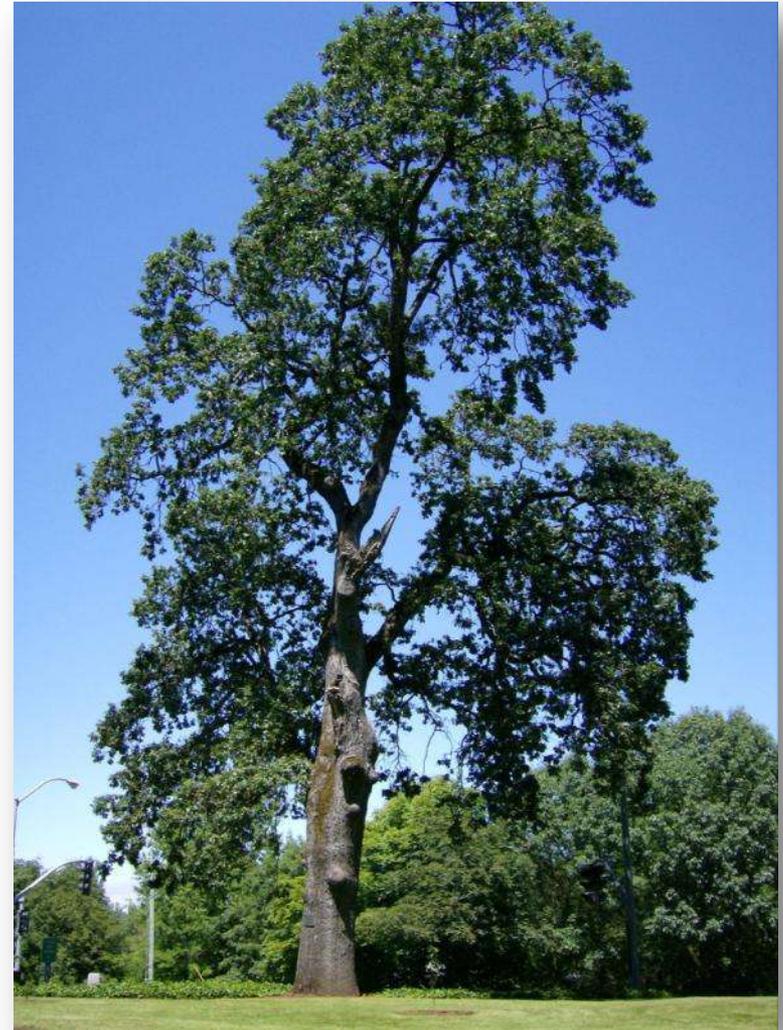
Nov. 9, 2012

Stockton, CA

Larry Costello

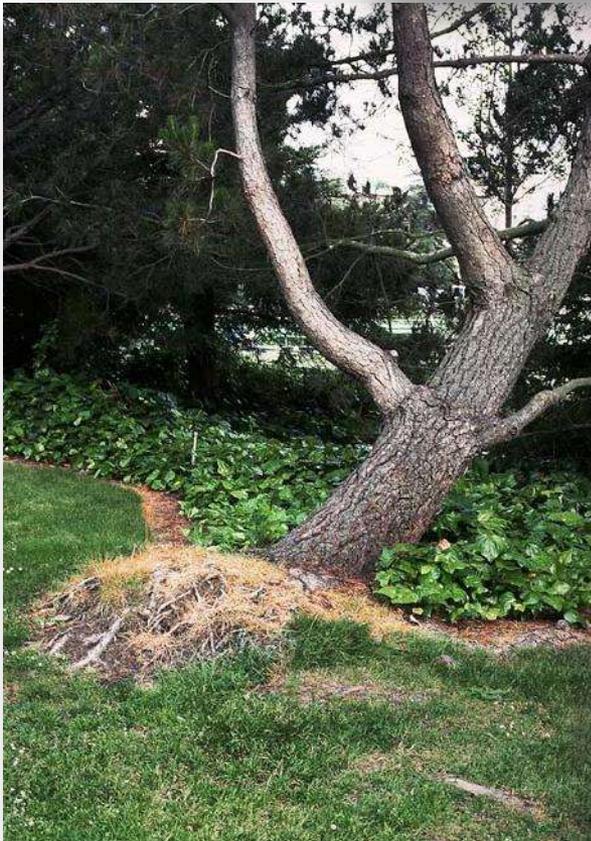
Oracle Oak LLC

# Sustaining New .....and Heritage Trees



Objective: Achieve mature, healthy and structural strong trees in a reasonable amount of time with a minimum of resources: natural, economic, and human

It's important to consider both health and structural stability



G. Mann

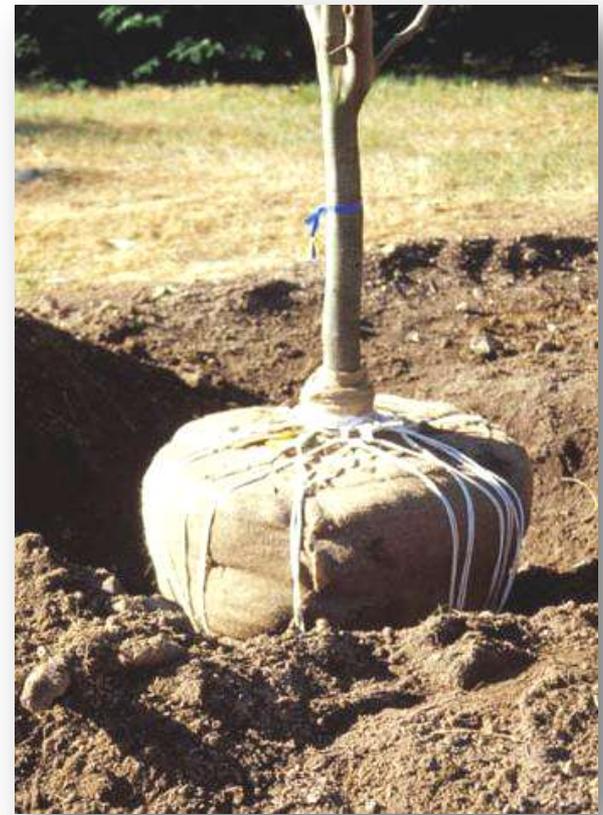
# 1. Quality Nursery Stock



Container



Ball and  
Burlap



Bareroot

Root systems should be free of defects

Container Stock



Kinked & girdling roots



Circling roots



Nursery stock being left in containers too long increases the potential for root defects.

Circling and girdling roots can be cut.....



...but not like this.





B & B stock suffers some level of root loss when dug from the nursery.

Root defects can occur during the propagation and planting process as well.



# 2. Planting Sites Must be Plantable!





Although some urban sites have favorable soils, many have soils that are unfavorable for landscape plants



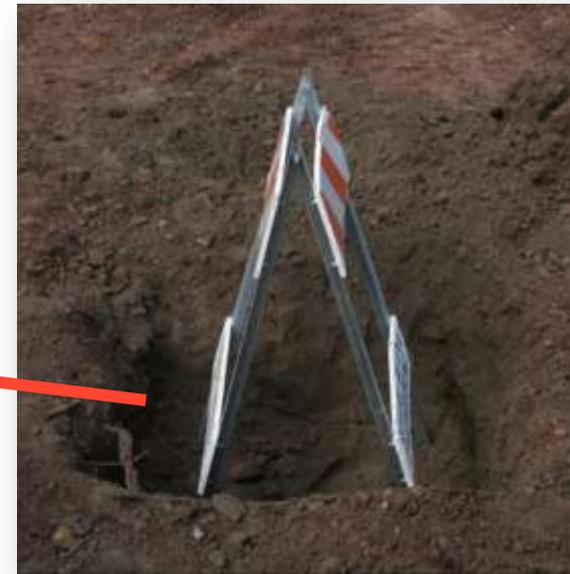


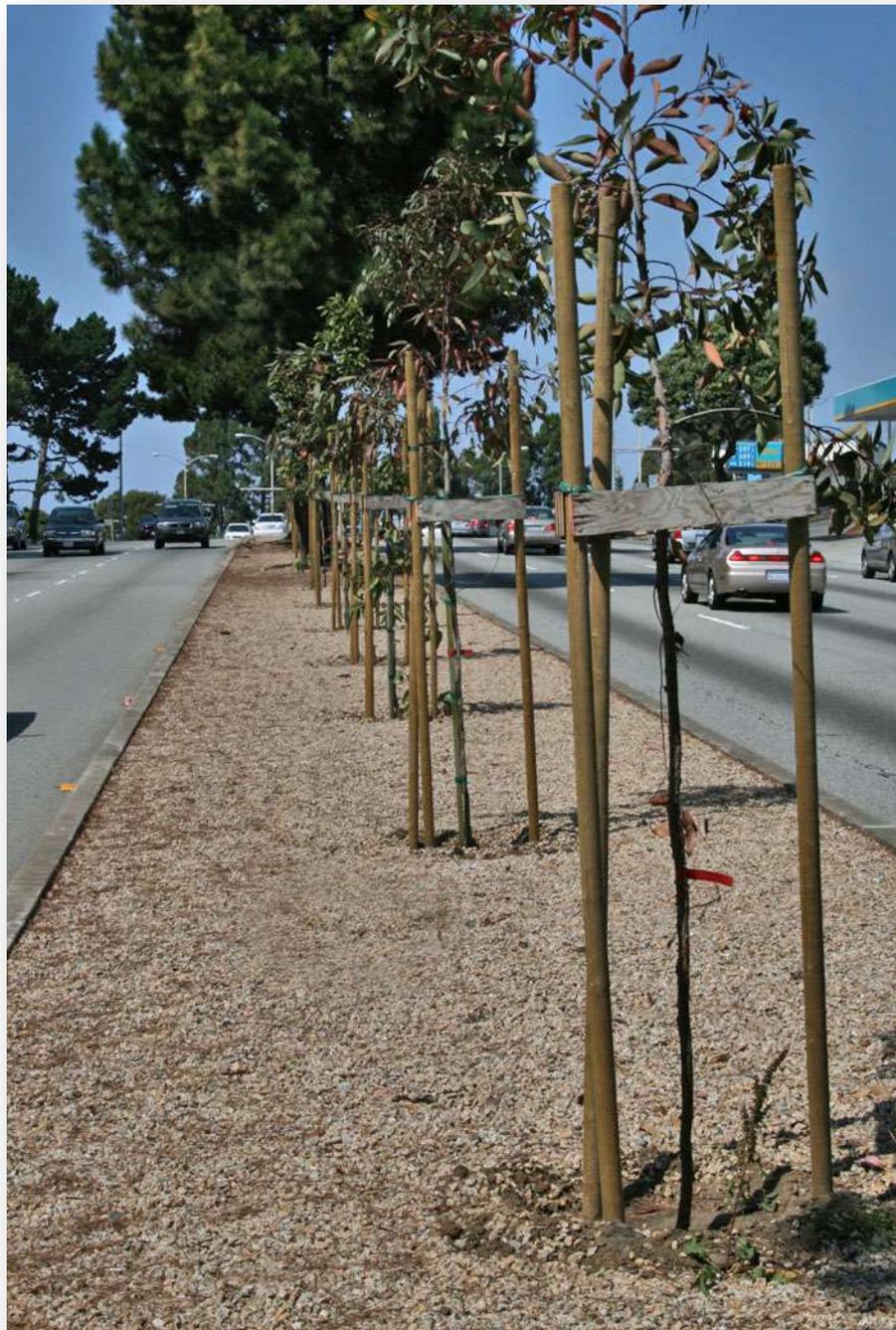
Soils can be highly variable across small areas.

Site conditions can range from very poor to very good. Which condition are you working with?



# Median planting in San Francisco





They look the same right now, but what will the picture look like in a year or two?



Soil volume is not large enough to retain sufficient water to meet the needs of these London plane trees.



Poor performance by design (i.e., poor design)

# Structural Soils



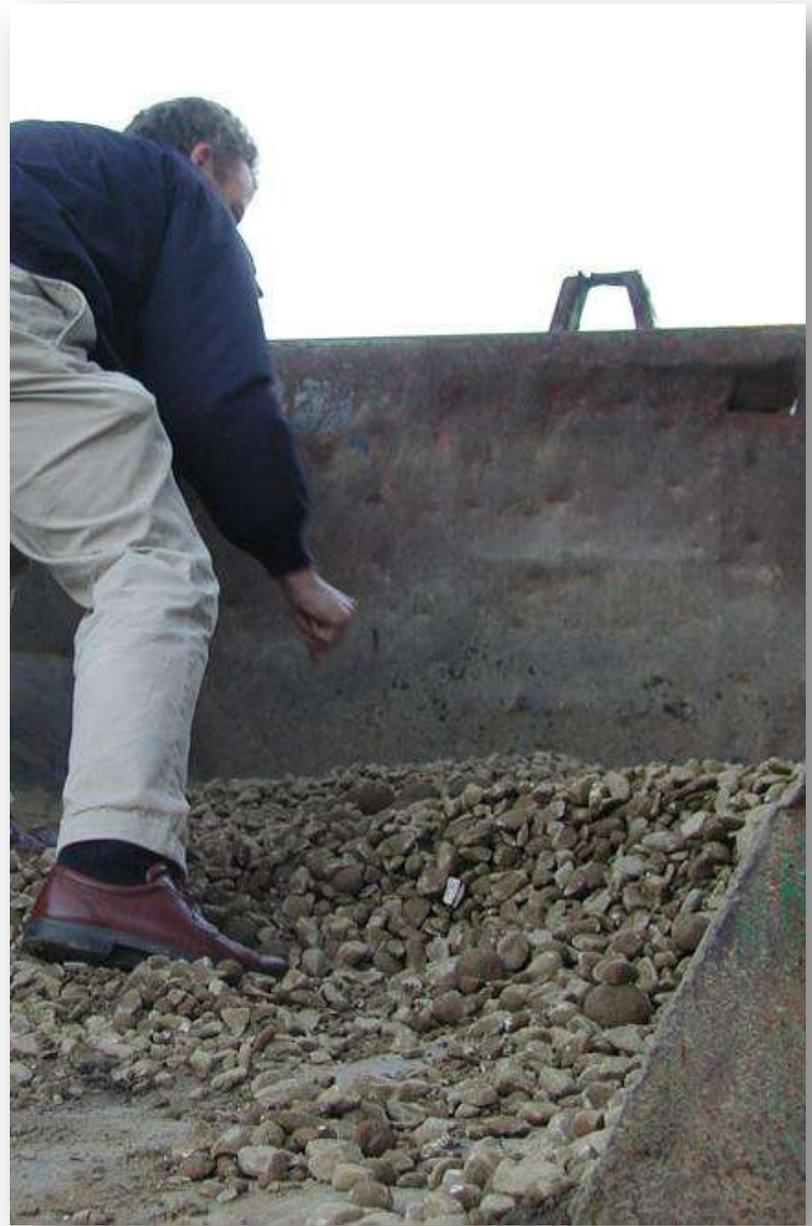
Soil volume may be only 20% of the mix volume. Limited soil volume limits water availability.



**Urban Horticulture  
Institute**

**Cornell University**

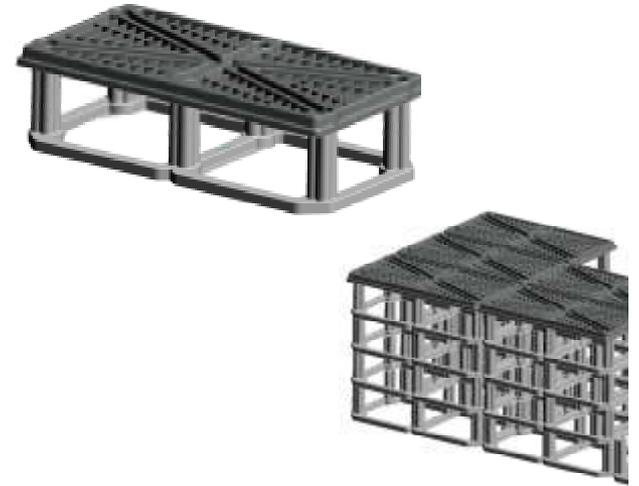
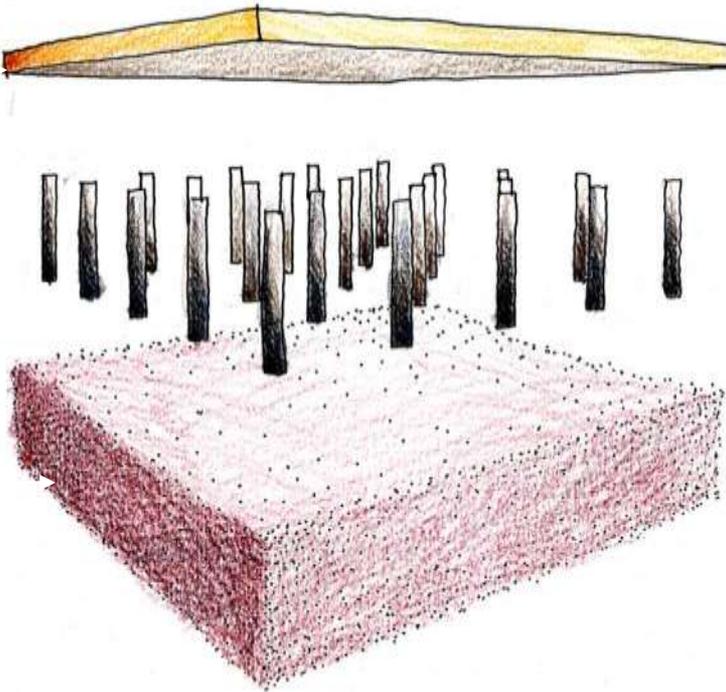
N. Bassuk and J. Grabosky



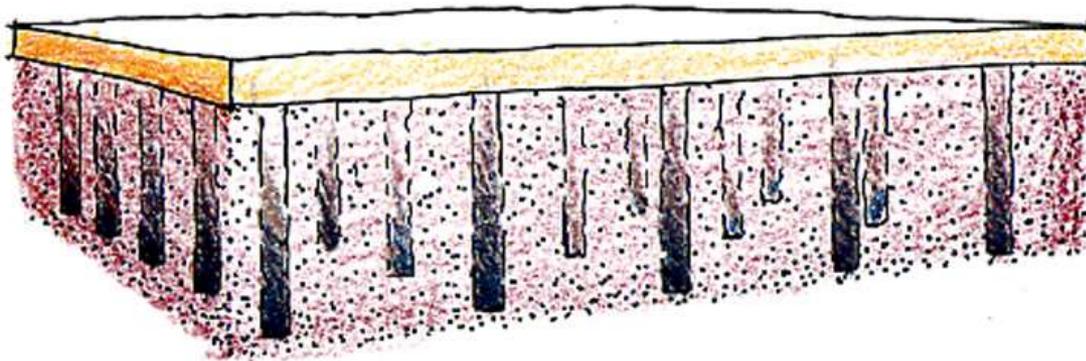
Pavement

Structure

Soil



Soil cells



### 3. Care after planting



# Heritage Trees and Construction





# Lots of Impacts Resulting from Development





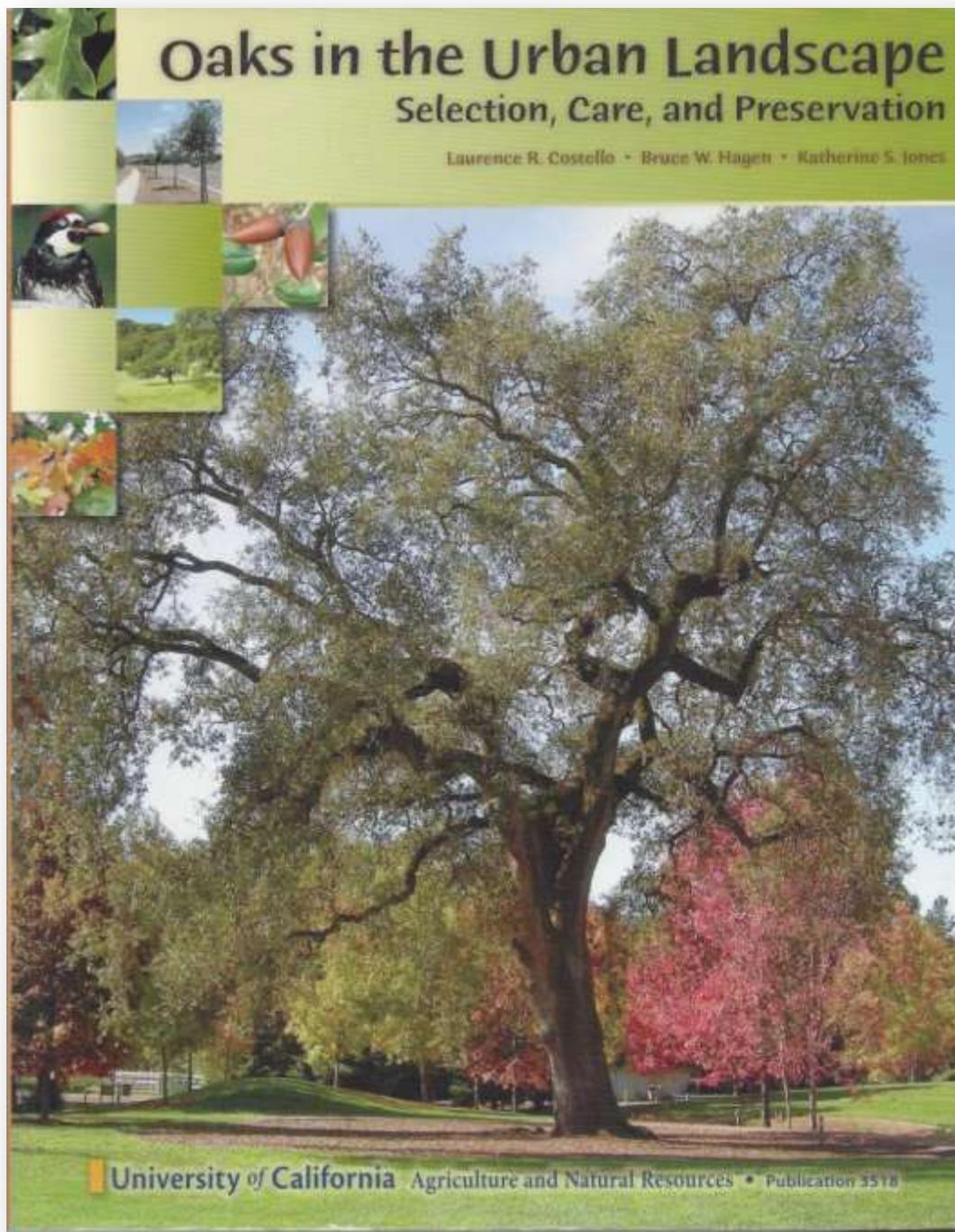


Root failure of valley oak





White Cop SNAP TILES  
White Cop  
6" SE HEX HEAD  
333 0763



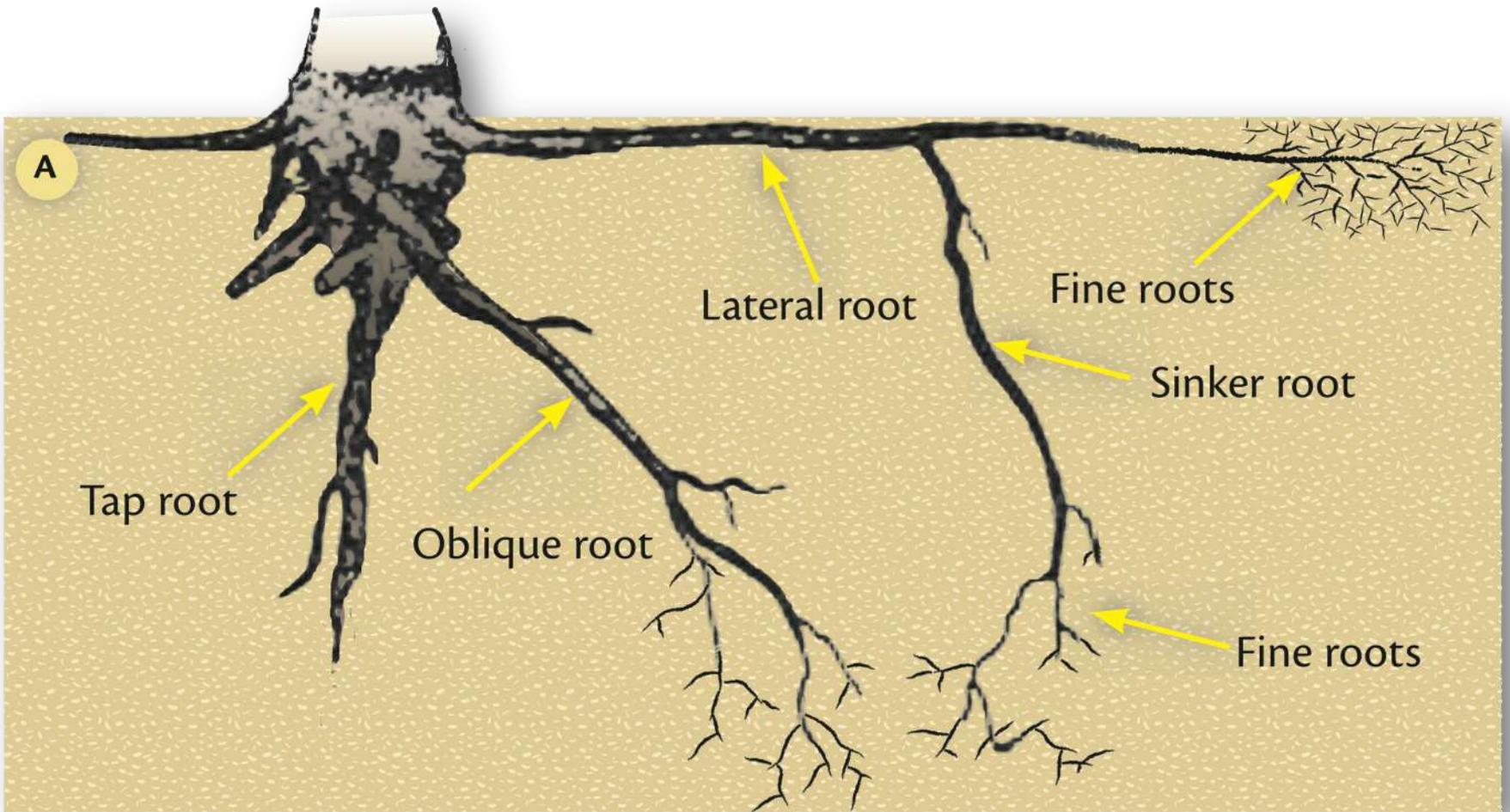
Publication  
#3518

Phone: 800-994-8849

Website:  
[anrcatalog.ucdavis.edu](http://anrcatalog.ucdavis.edu)

Impacts are focused largely on the root system. Many oak roots occur in the surface 3-ft of soil.







Trenching close to oaks will result in some level of injury due to root loss.





Valley oaks  
declining from  
root loss  
associated with  
a severe grade  
change

# Protection during the Development Phase



Tree Protection Zone (TPZ)

# WARNING TREE PROTECTION ZONE KEEP OUT

NOTICE: PROTECTIVE TREE FENCING IS  
REQUIRED ON THIS JOB SITE.

This sign must be posted on the protective fencing for each heritage tree on the job site, and remain up during the entire construction period. Fencing may not be removed without permission of the Town Arborist, 752-0526.

During construction all reasonable steps necessary to prevent damage to, or the destruction of Heritage Trees is required. Failure to comply with all precautions may result in a STOP WORK order and/or citations and fines up to \$5,000 being imposed by the Town.

Atherton Municipal Code 8.10.



Tree protection zones should be as large as possible. Tree age, condition, and species should be factored into TPZ size calculations.



Not good!



TPZs need to be protected!



Exceptions exist!



Since a number of factors influence root distribution, it is difficult to know where the roots of an individual oak are located.



Root location can be investigated using pneumatic excavation tools





# Fill Soils

Tree response depends on a number of factors: depth and type of fill, extent of root system covered, species and condition of tree, and the presence (or absence) of a well around the trunk.



# Care After Development







Healthy, vigorous coast live oak

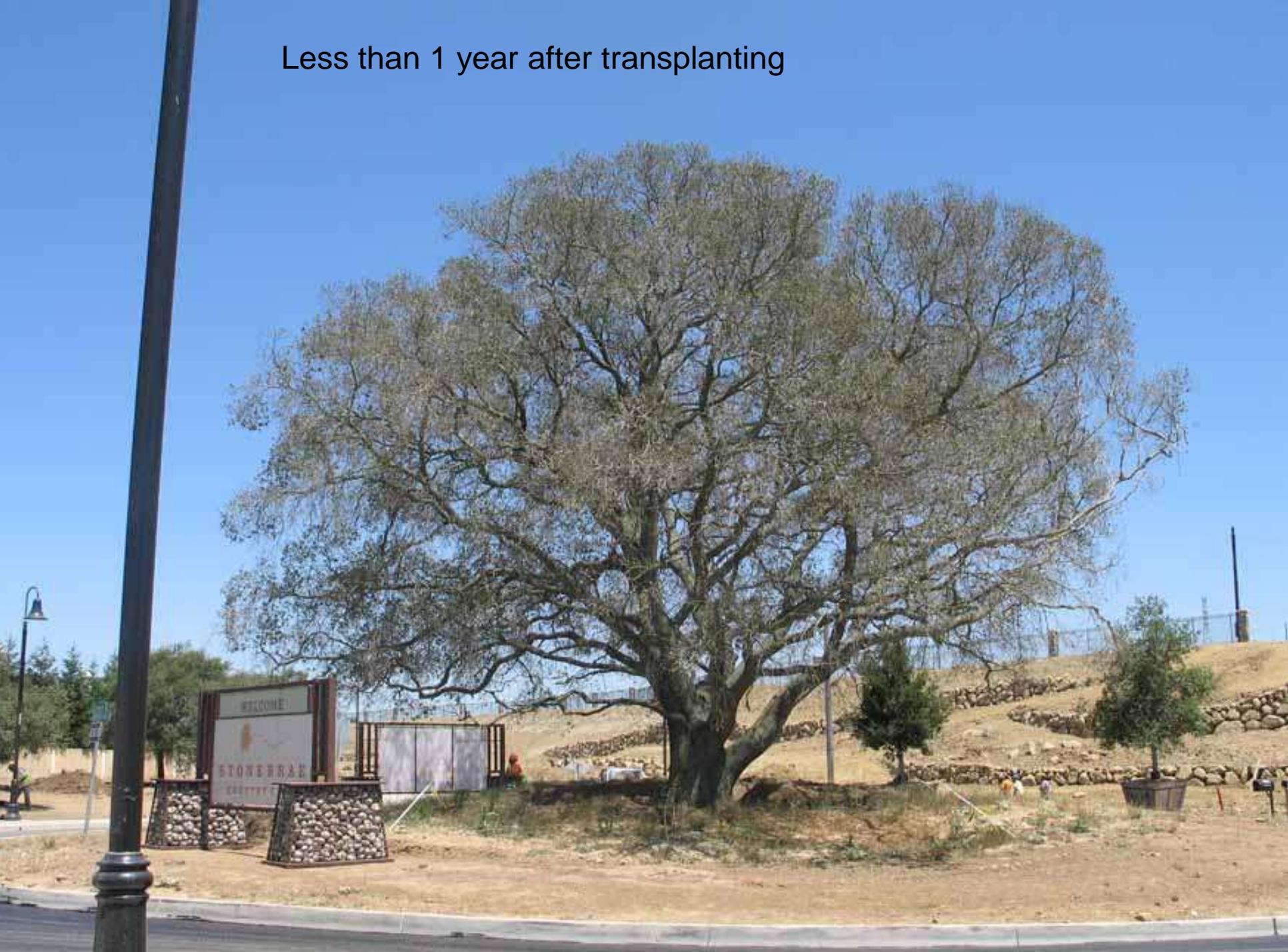


Dieback was attributed to excess water in the root zone due to overspray and runoff from turf irrigation --- as well as a leaky valve.

Coast live  
oak  
transplant



Less than 1 year after transplanting



2 years later --- with good water and pest management



Development around heritage trees can be successful, but needs to be well planned for long term success



