

LANDSCAPING UNDER NATIVE OAKS OF THE CENTRAL VALLEY

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California native oaks such as the valley oak (*Quercus lobata*), blue oak (*Q. douglasii*), interior live oak (*Q. wislizenii*), and coast live oak (*Q. agrifolia*) are some of the most significant natural components of our California landscape.

Besides beauty, they provide a multitude of benefits, including wildlife habitat, shading, erosion control, wind protection, pollution reduction, and screening. Oak woodlands are sustainable landscapes, requiring a minimum of resources if successfully incorporated into new developments.

Even with the most careful attention to the architectural design in oak woodlands, constructional alterations bring environmental changes that often lead to tree decline. By understanding the oak's habitat, physiology, growth habits and response to environmental changes, we can design and manage landscapes near oaks which ensure their survival. (See illustration on page 6.)

THE OAK HABITAT, GROWTH HABITS & ROOTS

California native oaks have evolved under the cool, wet winters and hot, dry summers typical of our Mediterranean climate. Through adaptations such as the development of deep

and extensive root systems, various water conserving leaf characteristics, and a slowing of growth in the summer, these trees are able to survive the prolonged seasonal droughts which typify the Central Valley.

California native oaks often produce sinker roots within several feet of the trunk. These grow deep into the soil profile, providing the oak access to water as the summer progresses.

Lateral roots are commonly shallow and extend well beyond the dripline of the tree. Maintaining the health of the oak root system is the key to successful landscaping around oaks.

Tree root health is largely affected by mechanical injury, physical and chemical properties of soil, and pathogens. During landscape installation, oak roots may be directly injured by backhoes, trenchers, tillage equipment or shovels, or indirectly by altering physical soil properties due to grading and compaction.

Frequent irrigation and compaction limit oxygen access to oak roots that favor pathogens, such as crown and root rot (*Phytophthora spp.*) and oak root fungus (*Armillaria mellea*). These fungi often lead to the decline or structural instability of California native oaks.

RECOMMENDATIONS FOR LANDSCAPE PLANTING, ESTABLISHMENT & MAINTENANCE

As a general rule, strive to ensure that the environmental conditions both above and below ground are similar to those conditions under which the oak grows naturally.

Therefore, an ideal landscape near most Central Valley oaks is one which will tolerate a minimum of maintenance and irrigation once established.

An appropriate plant palette may be composed of plants native to the local region or those plants which will tolerate the local environment (California natives or other Mediterranean plants). When establishing landscapes near oaks, one should observe the following guidelines.

- **Ensure that drainage from landscaped areas does not collect under oaks.**

Saturated soils, (especially near the tree trunk) when soil temperatures are moderate, create ideal conditions for the establishment of crown and root rot and oak root fungus, which can kill trees. Ensure that landscape grading does not allow drainage water to collect around the base of the trunk. French drains or other systems may be used to carry water away from the tree.



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• **Prevent tree injury and soil compaction during landscape installation.**

Avoid traffic and storage of equipment in the oak root zone. Install irrigation lines at the soil surface and cover them with mulch. Dig planting pits by hand whenever possible to avoid root injury. Where equipment operation is essential in the oak root zone, install a six-inch thick layer of woodchip mulch to reduce soil compaction.

• **Plant sparingly and away from the tree trunk.**

Ideally, do not plant under the oak canopy or at least within ten feet of the mature tree trunk where buttress and sinker roots (critical to the health and structural stability of the tree) are located. The frequent irrigation required to establish landscape plants creates conditions favorable for the fungi that can infect roots. Plant sparingly. Dense plantings can compete with oak root systems for water and nutrients. Therefore, use plants as accents and specimens near oak trees.

• **Irrigate landscape plants as infrequently as possible.**

The main goal of irrigation for newly planted plants should be to provide only as much water as required to establish them. The plants should be irrigated in as small an area as possible. A drip or microsprinkler system can be used for this purpose. However, it should be operated in such a manner as to avoid saturated soils for long periods of time. Once the plants are established, they should be irrigated monthly; less often, or not at all during the summer.

• **Plant appropriate species.**

Select plants that tolerate the Central Valley climate, drought, exposure to light as influenced by the tree, soils in the vicinity of the tree (*pH, drainage, texture, etc.*) and common pests. Many California native species or species from Mediterranean climates are most suitable for planting under oaks. Consider the ultimate size of the plants selected and whether or not they will interfere with the tree canopy, views or structures.

• **Utilize an appropriate soil surface cover.**

Avoid paving over the oak root system; the impermeability of these surfaces as well as the excavation and compaction associated with their installation damage tree roots. If an area in the root zone of a tree needs to be paved, limit the paving to as small an area as possible. Either install pervious pavers, or decomposed granite on grade with a minimum of compaction, (*no more than 80%*) or utilize a deck with piers. In non-paved areas, a woodchip mulch is an ideal soil surface cover. Install the mulch by hand to avoid soil compaction.

The list that follows contains the Latin name, common name, and comments about California native plants suitable for use under Central Valley oaks. The plants are first separated by sun (*light*)



requirements and then by plant type — shrubs, small trees, vines, grasses and accent plants, ground covers, annuals, perennials, etc.

To use the list, sketch the area to be planted, including the oak(s) trunk and dripline, other plants and structures. Indicate areas which receive full sun, partial shade, full shade or morning sun only. Choose plants from the list appropriate to the sun exposure in the area to be planted. Develop a planting design utilizing these species.

REFERENCES:

- (from Hortscript No. 11, March 1995, University of California Cooperative Extension; Adapted May 2000)

ADDITIONAL READING

For more information about oaks, see ***Living Among the Oaks: A Management Guide for Landowners***, ANR publication number 21538, \$1.50, 8 pages, published by the University of California Cooperative Extension, Natural Resources Program, Berkeley, California.

This publication is available at your local University of California Cooperative Extension Office.

LATIN NAME	COMMON NAME	COMMENTS
FULL SUN (TOLERATES SOUTH & WEST EXPOSURES)		SHRUBS:
<i>Adenostoma fasciculatum</i>	chamise	A low growing form is available.
<i>Arctostaphylos</i> spp.	manzanita	manzanita
<i>Artemisia tridentata</i>	basin sagebrush	Needs dead branches removed with age.
<i>Ceanothus</i> 'Concha' and 'Dark Star'		Dense, dark flowered varieties.
<i>Ceanothus cuneatus</i>	buckbrush	White flowers.
<i>Ceanothus megacarpus</i>	bigpod buckbrush	Tree type ceanothus which is one of the earliest to bloom.
<i>Dendromecon rigida</i> spp. <i>harfordii</i>	bush poppy	Showy yellow flowers.
<i>Encelia californica</i> spp.	encelia	Showy, yellow, daisy-type flowers.
<i>Ephedra</i> spp.	Momon tea	
<i>Eriogonum arborescens</i>	Santa Cruz Island buckwheat	
<i>Fallugia paradoxa</i>	Apache plume	Ornamental fruits.
<i>Forestiera neo-mexicana</i>	desert olive	Blue fruits are ornamental.
<i>Fremontodendron</i> spp. and cultivars	Fremontia	Large shrubs with golden, saucer-shaped flowers.
<i>Heteromeles arbutifolia</i>	toyon	Showy red berries around Christmas time.
<i>Isomeris arborea</i>	bladderpod the leaves.	Yellow flowers year-round. Some object to odor of
<i>Lupinus albifrons</i>	silver bush lupine	Short-lived but self seeds.
<i>Mahonia nevinii</i>	San Fernando barberry	Spiny leaves, good barrier plant.
<i>Pickeringia montana</i>	chaparral pea	Purple flowers in spring.
<i>Quercus durata</i>	leather oak	
<i>Rhus ovata</i>	sugarbush	
<i>Rhus trilobata</i>	squawbush	
<i>Romneya coulteri</i>	Matilija poppy	Large <i>fried-egg</i> flowers, spreads under ground runners.
<i>Salvia leucophylla</i>	coastal white sage	Summer dormant without irrigation.
<i>Simmondsia chinensis</i>	jojoba	
SMALL TREES:		
<i>Aesculus californica</i>	California buckeye	Summer dormant.
<i>Prunus lyonii</i>	Santa Catalina cherry	
GROUND COVERS:		
<i>Baccharis pilularis</i> var. <i>pilularis</i>	dwarf coyote bush	'Pigeon Point' is the best cultivar for the valley.
<i>Eriogonum fasciculatum</i>	California buckwheat	
<i>Salvia sonomensis</i>	creeping sage	Short-lived, water monthly, needs good drainage.
<i>Zauschneria californica</i>	California fuchsia	Many cultivar
<i>Zauschneria cana</i>	island California fuchsia	Fine, silver-gray foliage.
PERENNIALS:		
<i>Achillea millefolium</i>	yarrow	Mow after bloom to remove flower stalks.

LATIN NAME	COMMON NAME	COMMENTS
FULL SUN (TOLERATES SOUTH & WEST EXPOSURES)		PERENNIALS (CONTINUED)
<i>Dudleya spp.</i>	live-forever	Can be used as sparse ground cover, may freeze back in cold winters.
<i>Keckiella cordifolia</i>	heart-leaved penstemon	Summer dormant.
<i>Salvia 'Dara's Choice'</i>	hybrid sage	Evergreen perennial with purple-blue flowers.
<i>Viguiera deltoidea spp. parishii</i>	desert sunflower	Killed to ground in cold winters.
GRASSES AND ACCENT PLANTS:		
<i>Agave deserti</i>	desert century plant	Accent plant.
<i>Nolina spp.</i>	nolina	Accent plant.
<i>Stipa pulchra</i>	purple needle grass	Water monthly. Summer dormant.
<i>Yucca whipplei</i>	yucca	Succulent-leaved accent plant.
ANNUALS:		
<i>Clarkia spp.</i>		Showy pink blooms, monthly watering, mow after seed set.
<i>Eschscholzia californica</i>	California poppy	Reseeds in disturbed areas, mow after seed set.
<i>Lupinus spp.</i>	lupine	<i>Lupinus densiflorus</i> and <i>L. succulentus</i> are reliable year after year. Mow after seed set.
<i>Nemophila spp.</i>	baby blue eyes	
BULBS:		
<i>Allium spp.</i>	wild onion	Many sizes and colors.
<i>Brodiaea spp.</i>		<i>Triteleia</i> and <i>Dichelostemma</i> also. Summer dormant.
<i>Calochortus spp.</i>	mariposa lily	
<i>Chlorogalum pomeridianum</i>	soap plant	Three to four foot flower spikes open in afternoon.
PROTECT FROM AFTERNOON SUN (PARTIAL SHADE)		SHRUBS:
<i>Arctostaphylos densiflora</i>	Sonoma manzanita	Cultivars 'Harmony', 'Howard McMinn' and 'Sentinel'.
<i>Arctostaphylos rudis</i>	shagbark manzanita	
<i>Carpenteria californica</i>	bush anemone	Summer deciduous if not irrigated.
<i>Ceanothus 'Ray Hartman'</i>	hybrid ceanothus	
<i>Cercis occidentalis</i>	redbuds	
<i>Cercocarpus betuloides spp. blancheae</i>	mountain mahogany	
<i>Comarostaphylos diversifolia</i>	summer holly	Ornamental red fruits.
<i>Erigonum umbellatum var. polyanthum .</i>	sulfur buckwheat	Useful as loose ground cover or subshrub
<i>Garrya elliptica</i>	coast silktassel	Ornamental <i>tassels</i> in winter.
<i>Garrya fremontii</i>	Fremont silktassel	Ornamental <i>tassels</i> in winter.
<i>Mahonia pinnata</i>	California holly grape	Monthly watering.

LATIN NAME	COMMON NAME	COMMENTS
PROTECT FROM AFTERNOON SUN (<i>PARTIAL SHADE</i>)		
<i>SHRUBS (CONTINUED)</i>		
<i>Prunus ilicifolia</i>	hollyleaf cherry	
<i>Rhamnus californica</i>	California coffeeberry	
<i>Rhamnus crocea</i>	redberry	
<i>Ribes malvaceum</i>	chaparral currant	Summer dormant, winter flowering.
<i>Ribes speciosum</i>	fuchsia-flowered gooseberry	Summer dormant.
<i>Rosa californica</i>	wild rose	Invasive if irrigated.
<i>Symphoricarpos rivularis</i>	common snowberry	White fruits on winter deciduous branches.
<i>SMALL TREES:</i>		
<i>Lyonothamnus floribundas</i> var. <i>asplenifolius</i>	Catalina ironwood	Fern-like, divided leaves.
<i>Umbellularia californica</i>	California bay laurel	
<i>Mahonia pinnata</i>	California holly grape	Monthly watering.
<i>VINES:</i>		
<i>Aristolochia californica</i>	Dutchman's pipe	Winter deciduous, water monthly.
<i>Vitis californica</i>	California wild grape	Deciduous, autumn red color forms available.
<i>Vitis girdiana</i>	desert grape	
<i>GRASSES AND ACCENT PLANTS:</i>		
<i>Lymus glaucus</i>	blue wild rye	Monthly watering.
<i>Muhlenbergia rigens</i>	deergass	A large grass up to six feet tall. Monthly watering.
<i>Festuca californica</i>	California fescue	Monthly watering.
<i>GROUND COVERS:</i>		
<i>Ceanothus</i> 'Joyce Coulter'	hybrid ceanothus	Medium blue flowers, good bloomers.
<i>Ceanothus maritimus</i>	maritime ceanothus	Low shrub.
<i>Whipplea modesta</i>	yerba de selva	Monthly watering.
<i>PERENNIALS:</i>		
<i>Diplacus aurantiacus</i>	sticky monkeyflowers	Pinch to encourage new, bushy growth. Water monthly.
FULL SHADE OR MORNING SUN		
<i>GROUND COVER:</i>		
<i>Ribes viburnifolium</i>	evergreen currant	Best shrub for dry shade.
<i>PERENNIALS:</i>		
<i>Heuchera maxima</i>	giant alum root	
<i>Monardella</i> spp.	deer mint, pennyroyal	
<i>Salvia spathacea</i>	hummingbird sage	Large maroon and red flowers, water monthly.
<i>Sisyrinchium bellum</i>	blue eyed grass	Summer dormant without summer water.
<i>SHRUBS:</i>		
<i>Arctostaphylos pajaroensis</i>	Pajaro manzanita	Best manzanita for dry shade.
<i>Mahonia aquifolium</i>	Oregon grape	

LANDSCAPING TO PRESERVE NATIVE OAKS

