

# Benefits of Oaks

## Biodiversity

Oak woodlands are one of the most diverse ecosystems in California. In Napa County, oak woodlands provide habitat for a wide range of flora and fauna, some of which are threatened or endangered.

Valley oak trees are a **keystone species** - a species on which many other organisms in an ecosystem depend, such that if it were lost the ecosystem would change drastically. Valley oaks support approximately 300 animals, 1,100 plants, 370 fungi, and 5,000 insects and invertebrates.

Bears, black-tailed deer, scrub jays, magpies, wood ducks, wild turkeys, quail, flickers and acorn woodpeckers all depend on oaks for food. Insects feed on the leaves, twigs, acorns, bark and wood of oak trees (which in turn are food sources for other larger critters.) Some animals depend on oaks to keep them safe from predators, while others use the branches, cavities, and bark itself as a home. Oaks continue to be useful to wildlife even after they die. Salamanders, worms, snails, termites and ants live in decomposing logs and help turn wood into humus, which enriches soil.

## Climate Resiliency

Oaks, as well as other trees, sequester carbon in their mass as they grow. Large, long-lived trees such as oaks convert large quantities of carbon dioxide to various organic compounds that make up wood. Oak woodlands therefore provide a means for helping to offset the increase in atmospheric carbon dioxide levels related to the use of fossil fuels. Soils can also sequester carbon, and soils with high organic content such as those found under oak canopies can hold larger amounts of carbon, thereby reducing the amount of greenhouse gasses that contribute to global warming. Oak canopies also mitigate the effects of global warming by reducing ground surface temperatures. In urban areas, oak trees provide protective shading for houses and people, lowering energy needs for cooling homes.

## Water Soil and Air

Oak trees improve air quality by storing carbon dioxide and exhaling oxygen through the process of photosynthesis. The leaves of an oak tree absorb airborne pollutants. It has been observed that one tree can absorb up to 10 lbs. of air pollution in a single year<sup>1</sup> and oaks can live for up to 400 years.

Oaks reduce water pollution by absorbing fertilizer nutrients, pesticides, and other trace contaminants in soil, allowing compounds to break down slowly and be taken up as nutrients. During rains, oak tree canopies capture and slow rainfall. This helps slow the eroding energy of rain drops by intercepting rainwater on leaves and stems surfaces during storms. This process eventually increases the amount of time rain takes to reach the ground and helps reduce potential surface erosion which can impair waterways like

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<sup>1</sup> Tree Facts - Seiler, Jeffrey E. NC Cooperative Extension. Feb. 2009



## Sudden Oak Death

### *What is it?*

Sudden Oak Death or SOD is an invasive plant pathogen that mortally affects members of the Oak family<sup>2</sup>. This disease affects the leaves, bark, and trunk of oak species such as Tanoak, Coast Live Oak, Shreve's Oak, California Black Oak, and Canyon Live Oak. The fungus-like organism infiltrates woody tissues inside the tree, clogging and blocking water transport cells.

SOD mostly occurs in the United States, and is more prevalent in western regions such as California, Oregon and Washington

### *How does it spread?*

Phytophthora spores are spread in humid and moist conditions and can be transported via soil, rain/wind, dirty tools, and plant materials like leaves and bark<sup>3</sup>. California bay laurel is one of the most prolific hosts of the pathogen, so always beware when working near forests with these species. Take great care when working in forests with California bay laurel and coast live oak trees, or in areas where the pathogen is known to be present. Clean all tools and boots before and after working in outdoor spaces. Removal of infected trees may be necessary.

### *Identification*

SOD is difficult to spot with the naked eye so leaf and twig samples need to be sent to a lab for verification. However, California bay laurel will exhibit browning leaf tips and twig dieback.



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<sup>2</sup> Sudden Oak Death - Alexander, J.M. UC Cooperative Extension Statewide Integrated Pest Management . Sept. 2010

## Indigenous People and Oaks

### *Cultural Significance*

Oaks are considered medicinal trees by a variety of indigenous people. Oaks are associated with strength and protection. <sup>4</sup> Individual oak trees of great size and age have often been deemed sacred and used as spiritual centers for important tribal gatherings (such as weddings, peace conferences, and naming ceremonies.) Oak trees are also used as a clan symbol in some Native American cultures. Tribes with Oak Clans include the Pueblo tribes of New Mexico, whose Oak Clan is named Hapanyi. Although tribes like the Northwest Coast Indians are known to revere many species of Oaks, The Lenape Indians, also known as the Delaware Indians, have a special connection to a type of Oak called the Sacred Oak. Legend has it that a powerful Lenape chief's wife became gravely ill. The tribes' wisest healers and medicine men administered herbal medicines, but to no avail. The woman's illness worsened and in desperation, the distressed chief traveled to the Sacred Oak. There, he prayed to the Great Spirit that his wife be saved. Upon his return to camp, he found that, miraculously, she was in good health. It was from this point on that the Chinkapin oak was looked upon as the shrine tree of the Lenape Indians. Something dreadful is said to befall anyone who tries to hurt the tree.

### *Source of Food*

Indigenous people widely use acorns as a source of food. Three days of acorn gathering could result in food stores that would last an entire year<sup>5</sup>. Acorns can be processed into soup, mush, and flour by pounding, grinding, and leeching the tannins from the acorn meal. Records show usage of acorns in California for well over 9,000 years and the "plant part is found in greater quantities in archaeological sites than any other edible food. Once leached and cooked, acorn has a slightly nutty flavor and its bland taste makes it an excellent accompaniment to other native foods such as venison, salmon, butterfly pupae, and other insects.

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<sup>4</sup> Native American Oak Tree Mythology. Native American Indian Oak Tree Medicine, Meaning and Symbolism from the Myth of Many Tribes. N.p. n.d. Web. 25 Oct. 2015

<sup>5</sup> Indigenous Uses, Management, and Restoration of Oaks of the Far Western United States - Anderson, M. Kat US Dept. of Agriculture. Sept. 2007