

Grade 5/Student Reading

Life in the Oak Community

Oaks are common in San Diego. Canyon live oaks are found at lower elevations and in urban canyons. Coast live oaks and Engelmann oaks grow in meadows in East County. Black oaks grow in the mountains. They provide shelter, food, water, and places where wildlife live and reproduce.

Who lives in the oak community?

Oak communities are one of the richest habitats for wildlife. Healthy oak woodlands can support up to 350 species of animals. This includes many insects, birds, reptiles and amphibians, and mammals.



Barn owls, wood ducks, and many other cavity-nesting birds use oaks as their homes. In winter, squirrels sleep in hollowed-out portions of trees. Bees also use these cavities to build their hives. In spring, many bird species nest in oaks. In the summer, squirrels nest in oaks.

Nematodes, tiny round worms, and earthworms live within an oak's root system. The leaf mulch at a tree's base is home to many insects and spiders. Slugs, snails, beetles, millipedes, centipedes, caterpillars, earwigs, and ants live around the base of the tree. Many of these organisms help decompose dead leaves and branches, making the soil more fertile.

Many insects make themselves at home in oaks. Bark beetles eat through the living tissue just under the tree's bark. The tunnels create intricate patterns in the wood underneath the bark. Many oaks have galls, with insects living inside them. The oak tissue sometimes becomes irritated by insect eggs and grows a gall around them. This protects the insect and doesn't harm the oak tree.

Sometimes insects can kill the oaks. Locally, oak trees are threatened by an insect called the gold-spotted oak borer. The larvae live under the bark in the living cambium, where the nutrients and water move up and down the tree. The larvae eat this



living tissue, and this causes the tree to die after 5 to 6 years. The adult oak borer insects exit the tree in early summer. They can fly about a mile, and lay their eggs on the bark of other oak trees. The eggs hatch and the larvae start eating the cambium in the new oak trees. They follow the life cycle of insects!

Who lives in dead oaks?

Oaks continue to support the community even after they die. When a tree dies, its nutrients are recycled back into the environment through decomposition. Wood-eating insects invade a dead or dying tree. They break it down for other invaders to eat and live there. Plants and fungi absorb nutrients from the decaying wood. Here's a look at some common things you may find on, in, and around dead wood.

Many animals depend on decaying logs as places to hide from the elements. Beetles and other animals may spend the winter inside a rotting log. Some beetles, wasps, slugs, and other animals lay their eggs in decomposing wood. Salamanders may wait inside a log during the day, to stay cool and damp. Then they come out at night to hunt for food.

Some animals eat wood! Termites, sow bugs, carpenter ants, and wood roaches are scavengers that eat or tunnel through wood. They help break down the log into nutrients and soil. Many of those animals also eat other kinds of plant matter, such as dead leaves. Centipedes, beetles, and spiders are predators that feed on the wood-eating animals. Birds, skunks, and other animals tear into logs to eat these predators!

What foods do oak trees provide?

About two dozen different bird species eat acorns. Scrub jays, wood ducks, mountain quail, and flickers are just a few of these acorn eaters. Some woodpeckers also feed on the oak sap. One of the most colorful birds found in the oak community is the acorn woodpecker. This bird drills a hole in a tree's bark or in utility poles with its bill. Then the woodpecker pushes an acorn into the hole for storage. Acorn woodpeckers may store 200 acorns or more on a single tree trunk or branch!



Squirrels and scrub jays collect and hide acorns so that they can eat them later in the winter. These animals play an important role in helping new oak trees grow. Since well-hidden acorns are protected from freezing and drying, some of the stored acorns grow into new trees.

Many insects depend on oaks for food, too. Insects eat acorns and also eat oak leaves, twigs, bark, and wood. Many of these six-legged animals become meals for insect-eating birds.

Mule deer also eat acorns. Other wildlife species depend on the grasses, fungi, seeds, berries, insects, and many other foods that are found in oak communities.

Acorns were a primary food resource or staple for the Kumeyaay and other native Californians. The Kumeyaay harvested acorns in the fall around late October and early November. The whole community would go into the mountains and foothills to camp. They gathered acorns that fell from the trees and carried them in baskets. The Kumeyaay knew how to choose ripe acorns and acorns that were not infested with worms. They were careful not to take too many acorns. They knew special ways to store and prepare the acorns for food.

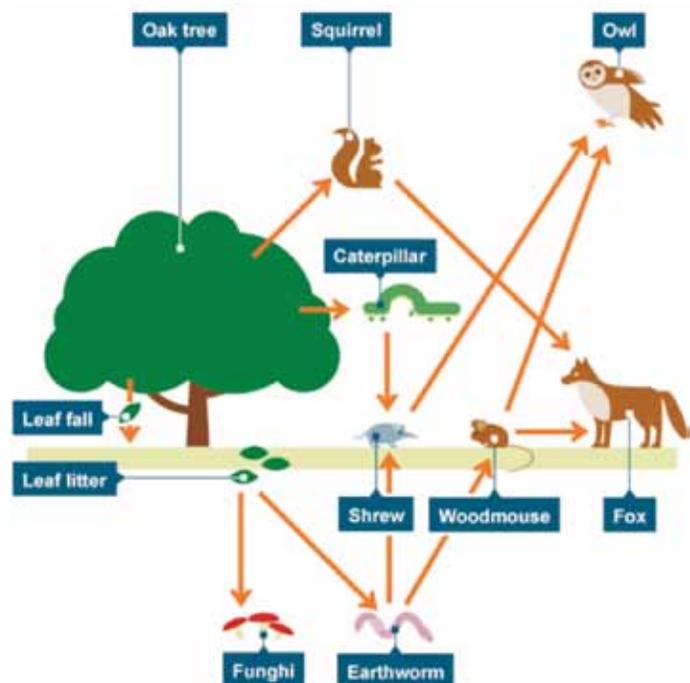
Oak Communities and the Food Chain

One way that plants and animals are connected is through energy. All life depends on the ability of green plants to use sunlight. Through this process, called photosynthesis, plants take energy from sunlight and make that energy available to animals as food.

A food chain is a simple way of showing energy relationships between plants and animals. An example of a food chain is: sun → plant → seed → mouse → owl. This shows that a seed is eaten by a mouse, which in turn is eaten by an owl. However, it is rare for an animal to eat only one type of food. Plant eaters (herbivores) eat the plants directly. Animal or flesh-eaters (carnivores) in turn eat herbivores or other carnivores, thus forming a food chain. Omnivores eat both plants and animals.

A food web describes the interconnection of food chains in an ecosystem. The food web gives a more complete picture of how plants and animals in an ecosystem are related to each other.

Plants and animals depend on each other in other ways besides food. For example, plants may depend on animals for pollinating flowers, dispersing seeds, and keeping insect populations in check. Animals may depend on plants for shelter from storms or cold weather. They may find shade under plants, to stay cool. ■



Grade: 5

Relationships

Oak tree communities include many organisms that are a part of food webs.



Teacher Background Reading

The relationships among plants and animals can be observed directly and documented by students as a food web. Students can explore the plants and animals in schoolyard, in a nearby park with trees and shrubs, a canyon, or other open space. By reading about local oak communities, students can learn how oaks have many relationships and provide rich habitats for wildlife. Healthy oak woodlands can support up to 350 species of animals. This includes many insects, birds, reptiles and amphibians, and mammals.

Food chains show how energy moves from one organism to another in the form of food. The arrows point from the primary source of food to the next thing that eats it, and so on. The arrows show the direction that the energy is flowing. Food webs describe the interconnection of the food chains in an ecosystem, and give a picture of how plants and animals in an ecosystem are related to each other. ■

Vocabulary

Carnivore: an animal that eats meat as the main part of its diet

Communities: all the different plant and animal populations interacting with each other in an ecosystem

Decay: to decompose through the action of bacteria and fungi

Decomposers: organisms such as fungi, bacteria or invertebrates that feed on and break down dead plant and animal matter

Decomposition: the mechanical or chemical breakdown of dead material

Ecosystem: a biological community of interacting organisms and their physical environment

Food chain: a series of organisms linked together by food energy, each organism eaten by the next one in the chain

Food web: the complex and interlocking series of food chains

Herbivore: an animal that eats plants as the main part of its diet

Omnivore: an animal that eats both animals and plants

Scat: animal droppings