Learning to Live with Fire

What do you think of when you hear the words "wildland fire"? If you are like most people, these words conjure up images of large tracts of charred and barren land, a scene of devastation. But did you know that fire is a natural and essential part of California's ecosystems?

California's Fire-Adapted Ecosystems

Fires have always been a natural component of the earth's ecosystems. As natural as wind and rain, fire helped create a patchwork of differing vegetation types. For millions of years in what is now North America, lightning and volcanic activity started fires, long before people came on the scene. Later, Indians regularly burned the vegetation to open up an area and to favor plants that attract game animals. These natural and human-caused fires have helped select vegetation types that tend to depend on fires for their existence. In these ecosystems, the plants and animals have many adaptations that help them survive and reestablish after fires.

Chaparral, found in central and southern California, is one plant community often impacted by fire. Typical chaparral plants include manzanita, ceanothus, chamise, and scrub oak, along with herbs and grasses. This community contains plants that are well-adapted to fire, and some that even encourage fire! After a fire, some chaparral plants sprout, grow, and spread rapidly. Many have heat-resistant seeds that break their dormancy after long intervals between fires. Many species of *Ceanothus* for example, have leaves that are coated with flammable resins that fuel a fire. This adaptation benefits the species because ceanothus seeds require intense heat for germination. "Fire-resistant" roots also enable the plant to resprout quickly in recently burned areas.

Other California plant communities are also adapted to fire. Giant sequoias live where lightning strikes and lightning fires are common. Mature trees are protected from fire by a fibrous bark that is 60 to 120 cm (2 to 4 feet) thick. This fire-resistant bark insulates the living tissues of the inner bark from the heat of the fire. Lightning fires can bum the thick layer of litter on the forest floor, exposing the mineral soil beneath. Fire is important to this community because the tiny seeds of the giant sequoia must fall on partially burned or bare mineral soil to germinate successfully.

Closed-cone coniferous trees show other adaptations to fire. These trees, including the knobcone pine, Bishop pine, and Sargent cypress, have seed cones that require the heat of a fire to open. The seeds are protected from fire behind tightly closed resin-coated scales, often so well insulated that even when the outer part of the cone is charred, the seeds inside are protected. High temperatures cause the cone to open, releasing the seeds that fall to the ground into a cool bed of ash and mineral soil.

The Role of Fire in California

Despite the apparent devastation after a wildland fire, fire is essential to the health of most ecosystems in California for several reasons. First, in chaparral and closed-cone conifer communities, the seeds need fire to germinate. Second, fires clear the forest of underbrush, leaving ash and opening the forest floor up to sunlight. The resulting grasses, herbs, and regenerated shrubs provide food for many wildlife species. Third, where the ground has a deep accumulation of fallen branches and dry litter, fires reduce this debris and supply nutrients to the soil. Periodic bums in an area help use up the fuel, which means that successive fire is less intense and less destructive than when fires are suppressed and plant debris accumulates. Last, but not of least importance, when fire removes a thick stand of shrubs, the water supply is in-

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creased. With fewer plants absorbing water, streams are fuller, benefitting other types of plants and animals.

Using Fire to Manage Wildland Fires

Controlled or "prescribed" wildland fire may have many of the same beneficial effects as a naturally caused fire. These fires can remove underbrush and help increase the herbaceous plants and insects that wildlife species need for food. Foresters commonly use fire to reduce debris and encourage regeneration of trees after a tract of trees is logged. Other benefits inc!ude the control of competing vegetation - which often include species not native to the area - and the control of diseases and pests.

According to land managers, perhaps the most important use of a prescribed bum now and in the future is to reduce the amount of dead vegetation on and other organic debris that decays very slowly in drier environments. This debris results in a hazardous situation, because it is much more likely that when a fire finally does occur, the abundant, dry fuel available will create a high intensity burn.

For many years, land managers thought that fire interfered with wildland growth and brought destruction to life and property. Their policy was to eliminate fire completely, using tough suppression measures. Today, however, land managers recognize the negative impacts of excluding fire. They are reversing this trend by increasing the use of controlled and prescribed burning, a practical and natural way to reduce the dangerous accumulation of fuels, and so to minimize the potential for severe wildfires.

When Wildland Wildfires Become Foes

While fire can be a "friend" to the natural landscape, it can also be a "foe" to people when it gets out of control. There is an important distinction between low intensity natural wildfires that are set or controlled for a particular purpose by a land manager, and wildfires that create the destruction that make headline news. A wildfire is a fire that runs "wild," burning out of control and made unpredictable by changes in weather. Some wildfires in California are caused by lightning that sparks dry leaves or other organic matter. Most often, however, they are caused by people and their activities. Common causes are arson, sparks from brush-clearing and equipment, improperly maintained campfires, smoking, and children playing with matches.

When a wildland fire begins, fire managers ask two major questions: "Where is the fire - in a forest or grassland, or in a human-dominated landscape?" If people and property are threatened, all efforts are made to extinguish the fire. In some areas, such as in national parks and forests, when the fuel moisture and weather are within the limits of a "prescription to burn," under surveillance, a fire may be pen-permitted to bum naturally until it goes out by itself or must be put out.

Wildland fire managers must constantly assess the threat of both natural and human-caused fire to the wildlands, and the threat of wildland fires to humans. In prescribing a fire or controlling a wildland fire, they must carefully evaluate and plan how the fire will effect the ecosystem, impact air quality, and threaten the safety of human life and property.

Living in a Fire-Prone Ecosystem

Each year during California's "fire season," usually from May to late fall, thousands of acres of wildland and hundreds of structures are burned. Some of the qualities Californians most enjoy - our warm, dry climate and beautiful natural landscapes - create one of the most severe potential wildfire conditions in the world. Added to this is the greater number of people moving into new communities that were once wildland areas - the foothills, grasslands, and mountains of California.

Mixing fire-prone wildland areas and suburban areas makes it very difficult to maintain the natural role of fire and to protect human lives and property. The rapid population growth into these areas of the state is putting great strain on the fire fighting forces as well as on the integrity of these fire-dependent ecosystems. Acknowledging that it is every Californian's responsibility to understand the role of fire in maintaining the health of fire adapted ecosystems, and to help protect lives and property from fire, there are certain steps that everyone living in a fire-prone area can take. By evaluating the risks and taking steps to make their community and property "fire safe," Californians can learn to live with fire.

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