

Fuel Reduction



In the Community

Hazardous fuels on privately owned lands in the wildland-urban interface can carry a wildfire into a residential area. A dense stand of Monterey pines planted on private property in the 1980s was infected with exotic pitch canker and created a hazardous fuel condition along Panoramic Highway. Panoramic Highway is a steep narrow corridor that provides access to more than 300 homes in Mill Valley. This project will convert approximately two acres of pine to grassland.

Vegetation treatments have also been funded on property owned by Homestead Valley Land Trust, the Marinview Community Service District, Mount Tamalpais Elementary School, the Headlands I & II subdivisions, and the San Rafael Federation of Neighborhoods.

Along the Interface

Several shaded fuel breaks between communities and adjacent wildlands are being developed to increase fire protection for neighborhoods in Sausalito and Inverness.

Shaded fuel breaks are zones of forest where vegetation density has been reduced. Trees are "limbed" to remove lower branches which may carry a ground fire to the tree canopy. Understory vegetation is also thinned, and ground fuels such as fallen branches and leaf litter are removed. This type of treatment reduces the intensity of a wildfire, and increases firefighter safety and effectiveness.

From the outside, it is difficult to see where a shaded fuel break is, but walking within it, there is more space, and less vegetation.

In Wildlands

The Alta Avenue Fuel Reduction project is in the process of removing over 10 acres of fire-prone, non-native broom and eucalyptus from a section of Golden Gate National Recreation Area which interfaces with Sausalito and Marin City.

Eucalyptus trees are extremely flammable due to the large amount of leaf litter they produce and the volatile oil in their leaves. Several of the eucalyptus stands about Marin City presenting a significant fire hazard.

Both eucalyptus and broom have displaced more fire resistant native plant communities. The eucalyptus sites will be revegetated with native oaks, shrubs and grasses.

Using Prescribed Fire

Fuel reduction on wildlands is also accomplished by prescribed fire. Many of Marin's wildlands have become overgrown because naturally occurring fires have been suppressed. Fire in nature is an ecological process which reduces fuels.

Prescribed fire to reduce hazardous fuels is central to the fire management plans for Point Reyes National Seashore and Golden Gate National Recreation Area as well as the the Marin Municipal Water District's Vegetation Management Plan for Mount Tamalpais.

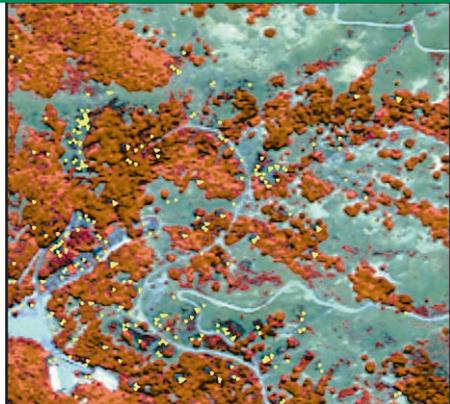
In one comparison, mechanical fuel removal cost \$1,500 per acre and prescribed fire cost \$500 per acre. Prescribed fire also has other important ecological benefits such as diversifying habitat, improving reproduction in some species and recycling soil nutrients.

Photos from left to right: 1) Monterey pines along Panoramic Highway. 2) Homes in Marin City. 3) Eucalyptus grove along Alta Avenue. 4) Prescribed fire at Point Reyes National Seashore.

Mapping Sudden Oak Death



Sudden Oak Death has produced a number of dead and dying trees throughout Marin. Part of this serious ecological problem is the fire hazard created by dead wood.



Satellite photography is being converted into a map to better understand where Sudden Oak Death is occurring in Marin. The yellow areas in this picture represent dead oak trees.

A county-wide effort is under way to create a Sudden Oak Death map in order to plan a series of fire hazard reduction projects and help researchers better understand why some areas may be more susceptible to the disease.

A series of high resolution satellite images is being combined and converted to a computerized map which distinguishes healthy and dead oaks. Dead wood is a fire hazard.

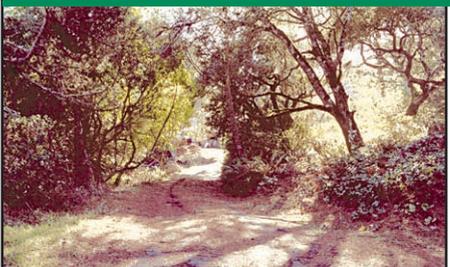
In addition to federal wildland-urban interface funding, this project has also received funding from the Marin Community Foundation, California State

Parks, Marin Municipal Water District and the County of Marin.

Sudden Oak Death is caused by *Phytophthora ramorum*, a water mold that acts like a fungus. Introduced Phytophthoras are affecting plant communities worldwide.

The disease is widespread in coastal California and is commonly found in tanoak in the understory of coast redwoods, and in evergreen hardwood forests dominated by oaks, madrone, and California bay. Cases of dying trees were reported as early as 1995 in Marin. Infection was recently confirmed in coast redwood and Douglas fir trees.

Improving Emergency Access



An unpaved road in a neighborhood near Tomales Bay State Park. This road could not provide safe transit during a wildfire if the vegetation was burning.

Many projects involving fuel reduction along roads are taking place in Marin communities. Road conditions are critical to both firefighter access and evacuation of residents during a wildfire. Roadside vegetation can create a tunnel of flames during a fire.

The public resource code calls for 10 feet of clearance on each side of roads and 14 feet of vertical space for emer-

gency vehicles. Turnouts and turnarounds are also critical and are often lacking on rural, non-county maintained

roads. Roadside vegetation management also increases the ability of a road to function as a fuel break.

Roads are are critical during an emergency. Ironically, a large number of wildland fires are started along roadsides just from sparks coming off vehicles.