CALIFORNIA
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Forest Health *2011 highlights*

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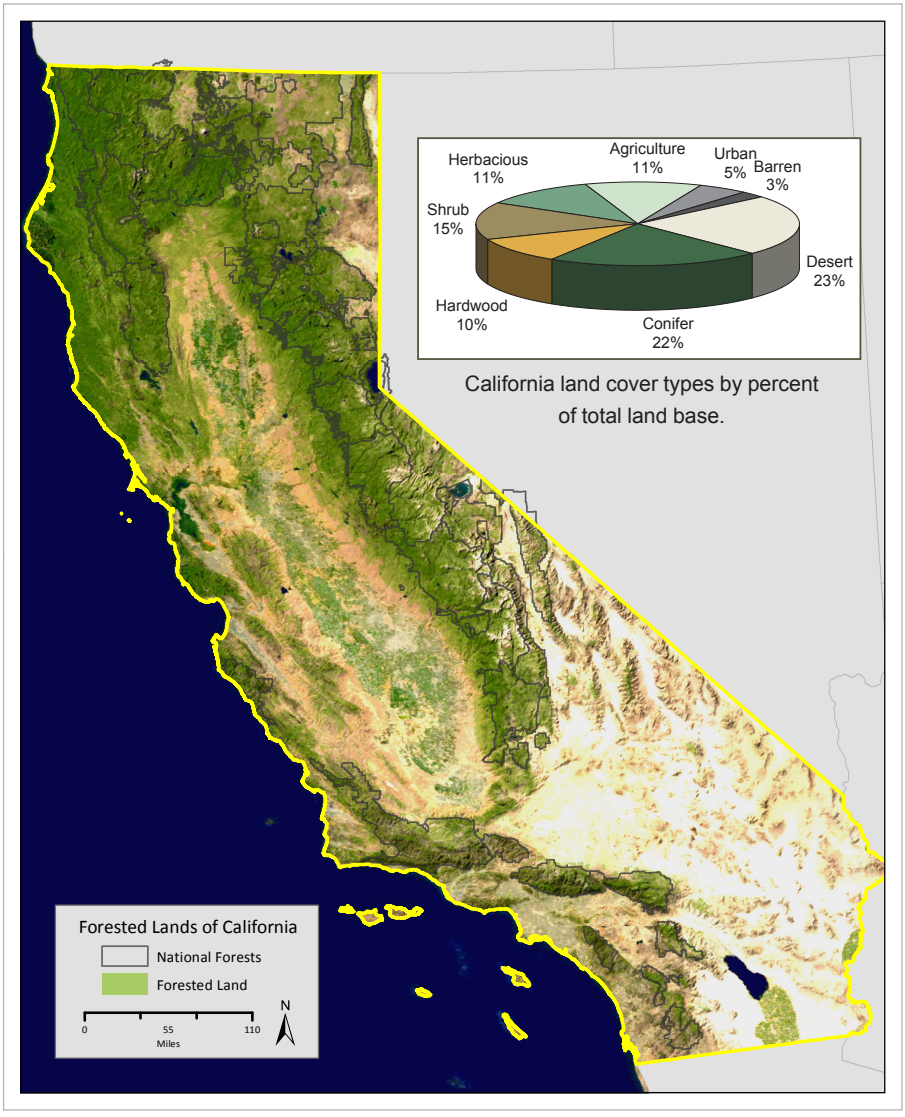
Forest Resource Summary

From the Cleveland to the Klamath, California's National Forests contain a treasure of wildlife, recreation, and much more. More than 600 of the 800 species of fish and wildlife and 4,000 of the 6,500 native plants in California reside in National Forests. Also, these 18 National Forests account for 25 percent of National Forest recreation nationwide and about half of the public wild land recreation in the state. National Parks and other federal, state, county and private lands provide the remainder.

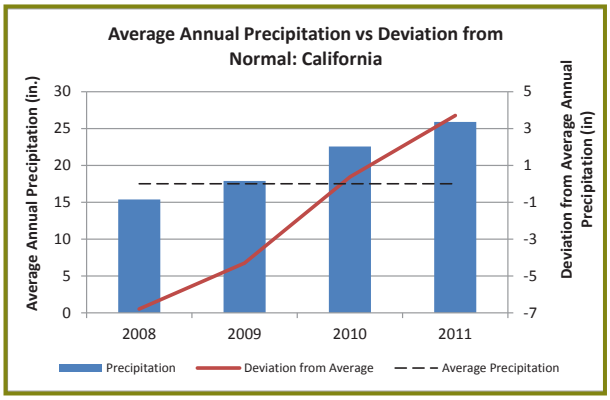
Region 5 of the USDA Forest Service works cooperatively with federal and state partners to map, measure, monitor and assess the effects of biotic and abiotic agents in California's forests. California's forests are among the most complex and diverse in the nation, with 25 major forest types occurring across 32 million acres of the state. Approximately 33% of California is forested and is susceptible to a variety of forest pests, including bark beetles, root diseases, depending largely on geographic location, tree species composition, tree stocking, drought, air pollution and other environmental factors.



California land cover types by percent of total land base.

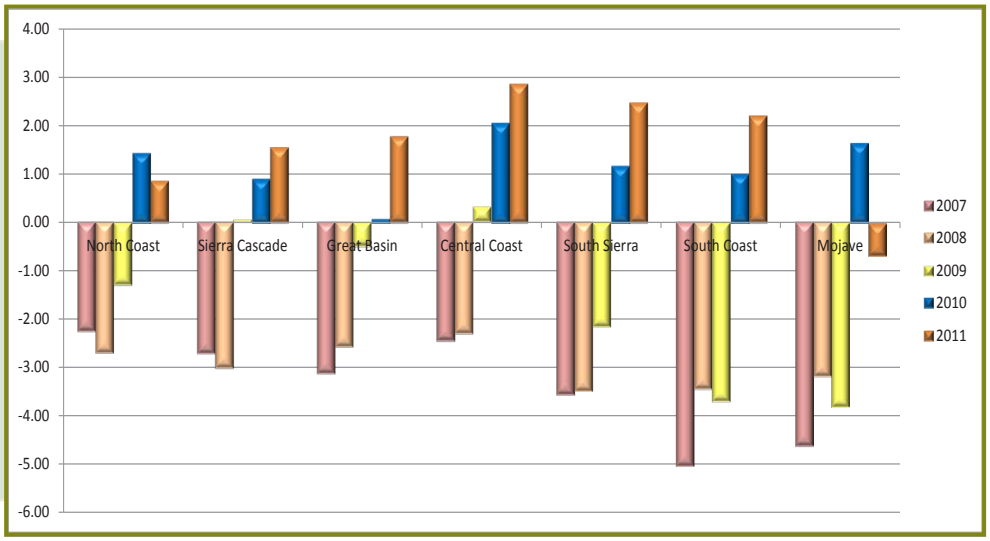
Environmental Conditions

In 2011, California received abundant precipitation for the second year in a row (100% of normal for the water year 2010 and 145% of normal for the 2011 water year). Both years experienced late spring/early summer rains. The abundant rainfall had profound impacts on forest pests in the state, including decreasing most bark beetle activity, and increasing the spread and intensity of many diseases.



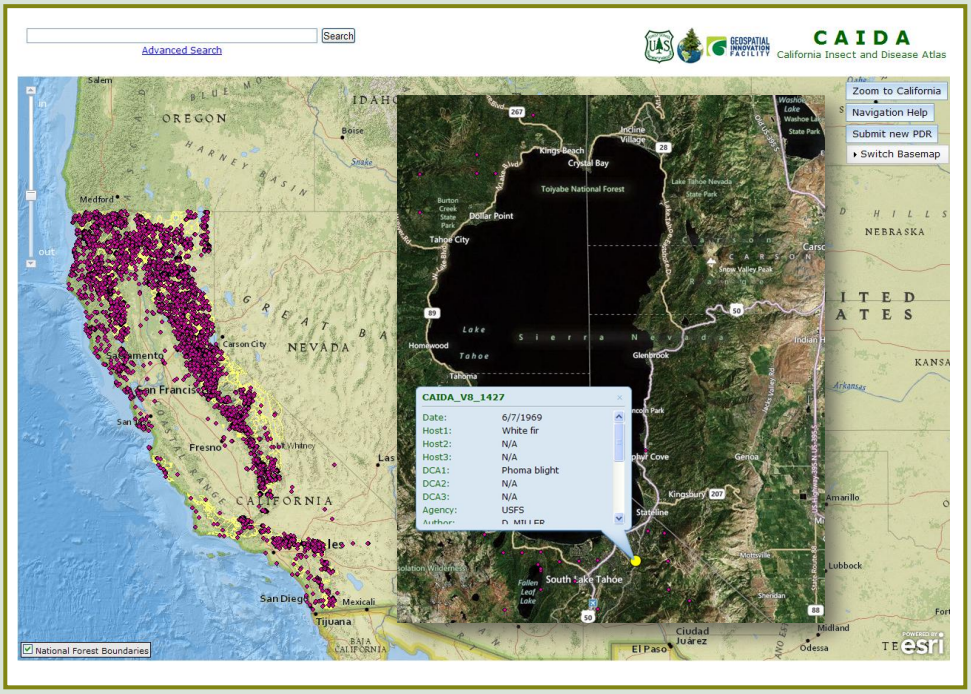
Palmer Drought Index

The Palmer Drought Index is an indicator of drought or moisture excess and ranges from -6 to +6, with negative values denoting degree of drought. 2011 and 2010 moisture values overall increased greatly over those from the preceding three years.



2011 Aerial Detection Survey

Aerial surveys are conducted annually to assess the health of California's forests. Surveyors fly in light, fixed-wing aircraft and use a digital sketch-mapping system to rapidly document tree mortality and damage events across the State. In 2011, 42 million acres were surveyed throughout California. A total of 537,000 acres with mortality was mapped, a decrease from 2010. This decrease was mostly driven by a reduction in true-fir mortality. A survey specifically for detection of gold-spotted oak borer (GSOB) was also conducted in the Sierra foothills; follow-up ground surveys found no evidence of GSOB in that area. Aerial surveys for sudden oak death showed an increase in tanoak mortality from last year in California's northern coast, ending three years of consecutive decline in mortality from SOD.



California Insect and Disease Atlas

The California Insect and Disease Atlas (CAIDA) is an online database of historic pest detection reports dating back to the early 1900's. CAIDA contains over 7,500 records including information such as host type and pest activity at specific locations. This database provides important information about trends in pest activity over time. New in 2011 is an online pest detection report feature that allows specialists to enter data online and in real time.

Goldspotted Oak Borer (GSOB)

Since 2002, an invasive beetle called the goldspotted oak borer (GSOB) has killed thousands of oak trees in San Diego County. It is believed that GSOB was transported into California on firewood brought in from Arizona. Over 1,300 acres were impacted by coast live oak and black oak mortality in 2011.

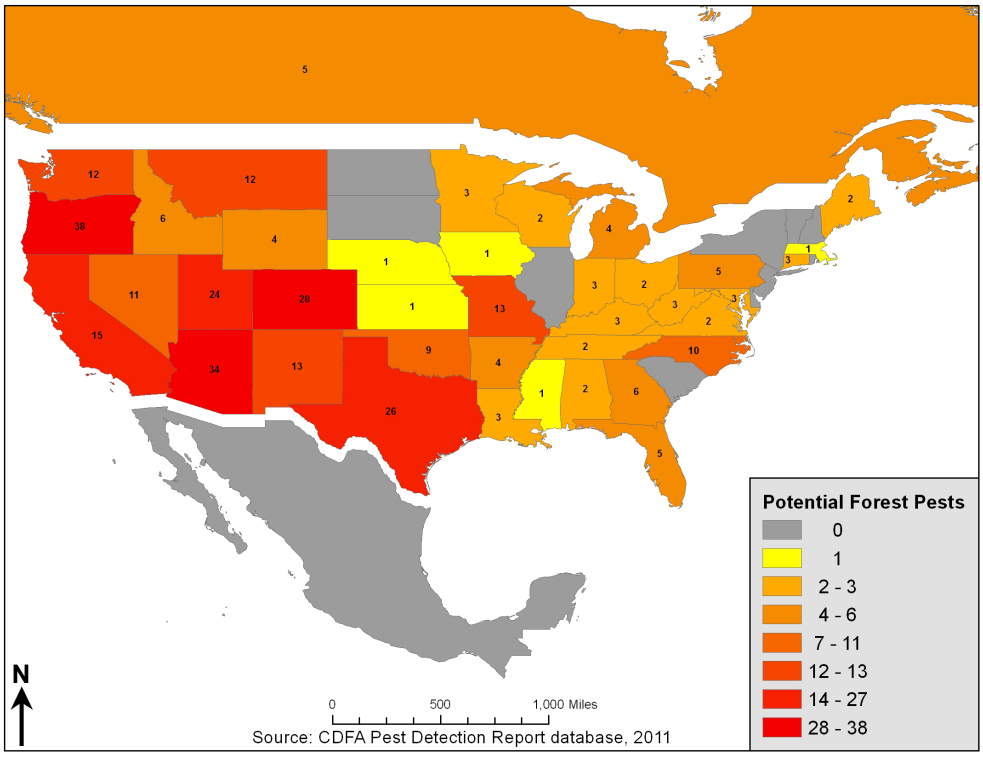
The key management strategy for preventing GSOB spread is to stop the movement of infested oak firewood to non-infested areas. GSOB larvae can live underneath the bark of dead oaks for over a year before exiting the wood as adults. With oak firewood highly desirable for home heating and campfires, and obtainable at low costs, the risk that GSOB will be introduced into new areas via firewood movement is high.

Redhaired bark beetle, an exotic bark beetle from Eurasia, was discovered for the first time in the Bay Area, a substantial increase in its known distribution in California. There is concern that this beetle could spread blackstain root disease, a native pest of conifers.

Goldspotted oak borer-caused mortality in canyon live oak, Cleveland National Forest. Photo by: T. Coleman

Movement of firewood has been implicated in the rapid multi-state spread of destructive forest pests, such as the Emerald Ash Borer. The California Firewood Task Force (CFTF) was established under the California Forest Pest Council and launched an outreach campaign to deliver key messages about the threat firewood movement poses to our forest resources. Outreach and education materials included question and answer sheets, and posters with the key message “Buy It Where You Burn It”, to encourage local use of firewood.

Data from the California Department of Food and Agriculture’s (CDFA) sixteen border protection stations were analyzed to determine how much firewood was entering the state, how many potential forest pests were intercepted in firewood, and the origins and destinations of the firewood and pests. The map below shows the origin states of potential forest pests intercepted in firewood by CDFA border stations in 2011. Almost 23 million pounds of firewood and 337 potential forest pests were recorded.



Visit the Task Force website at www.firewood.ca.gov.

Mountain pine beetle-killed whitebark and lodgepole pines on June Mtn Ski Area, Inyo National Forest. Photo: B. Bulaon

Ponderosa pine mortality caused by western pine beetle, Moonlight Fire area, Plumas National Forest. Photo: D. Cluck

Bark and Engraver Beetles

The largest bark beetle concern in California for 2011 continued to be mountain pine beetle (MPB) activity in high elevation pine species, especially in whitebark pine. MPB activity in California whitebark pine stands will likely receive even more attention due to the recent determination that whitebark pine is a candidate for listing as an endangered species. MPB-caused mortality in lodgepole and whitebark pine has reached stand-replacing levels in several locations such as the Warner Mountains of northeastern California and High Meadows in the Lake Tahoe Basin.

A drastic decline in the number of trees killed by fir engraver beetle was observed in 2011 in many areas of the State. Western pine beetle-caused mortality of ponderosa pine remained at levels similar to 2010 in most areas. Jeffrey pine beetle activity remained very low throughout the state in 2011.

Pitch tubes on Jeffrey pine beetle-attacked Jeffrey pine, Mill Creek Campground, Plumas National Forest. Photo: D. Cluck

Red fir mortality caused by fir engraver; root disease found in nearby stumps, Kern Plateau, Sequoia National Forest. Photo: B. Bulaon

Native Insects

Defoliators

Douglas-fir tussock moth (DFTM) caterpillars defoliate trees by feeding on the needles. The caterpillars are covered in long hairs that can cause irritation and rashes on humans. An outbreak of DFTM on the San Bernardino National Forest declined in intensity in 2011. Douglas-fir tussock moth populations continue to remain at background levels throughout the remainder of the state.

Black oak leaf blotch miner activity increased in both intensity and number of acres on the Tahoe National Forest in 2011. Black oak experienced loss of leaf area by this moth species. This is the highest level of defoliation since this outbreak began in 2005.

Other defoliation events reported in 2011 included California oakworm feeding on coast live oak in the Monterey area, and fall webworm and white fir sawfly activity in Northern California.

Above: Fall webworm damage on mature madrones along Highway 88 in Amador County. Photo: B. Bulaon

Below: White fir sawfly larvae feeding on white fir branch, Plumas National Forest. Photo: A. Grady

Native Diseases

After two consecutive years with late rains, anthracnose and other foliage diseases were evident across the state. Oak and sycamore anthracnose, madrone leaf blight, western gall rust, elytroderma needle disease and conifer needle cast diseases all increased in frequency and severity. These diseases cause loss of foliage by killing needles, leaves and small branches. Diseases such as Heterobasidion and blackstain root disease, were involved in large-scale mortality events in 2011 as well.

Sycamore leaves infected with Anthracnose in San Luis Obispo Coounty. Photo: K. Camilli

Ponderosa pine mortality at McCloud Flats (Shasta-Trinity NF) due to the combined effects of drought, Heterobasidion root disease, black stain root disease and western pine beetle. Photo: P. Angwin

Redwood Creek after treatment. Photo: Z. Heath

Sudden Oak Death (SOD)

SOD has caused substantial mortality of several species of native oaks and tanoak in California since the 1990's. A prominent change in sudden oak death distribution within California was the discovery of SOD in Redwood Creek in Humboldt County in 2010. In response, the University of California Cooperative Extension has directed a suppression program at that location in 2011 to control the disease.

An upswing in SOD-related mortality was detected from aerial surveys on California's North Coast for the first time in several years. However, despite this increase, aerial and ground surveys, along with stream monitoring efforts, detected no evidence of SOD in Del Norte, San Benito or San Luis Obispo Counties, which neighbor the known distribution of SOD.

Port-Orford-Cedar (POC) Root Disease

POC root disease is a serious disease of Port-Orford Cedar and has spread throughout much of the range of this species in California. In 2011, a new 10-acre infestation of Port-Orford-cedar root disease was confirmed along an unnamed tributary that flows into the Sacramento River.

Dead and dying Port-Orford-cedar at the Saint Germaine Foundation property in Dunsmuir, CA. Photo: P. Angwin

Damage caused by Animals

Black bears continued to cause serious economic impacts to commercial redwood lands in northwest California in 2011. Damage is caused by bears stripping the bark to feed on the sapwood. For the first time, this feeding damage was reported in Mendocino County, well south of where this feeding behavior is known to occur. Most damage occurred on coast redwood, but grand fir was reported damaged at the Mendocino site as well. It is believed that this may be the first recording of black bear feeding on grand fir.

California is home to thousands of native plant species and is recognized internationally as a "biodiversity hotspot". Approximately 1,800 non-native plants also grow in the state, several of which are considered troublesome in forested areas of the State.

Licorice plant, Mt Tamalpais, Marin County. Photo: D. Gluesenkamp

New invasive plant species reports for California forests include shiny geranium (*Geranium lucidum*), large leaf St. Johnswort (*Hypericum grandifolium*), and the escaped ornamental licorice plant (*Helichrysum petiolare*). Eradication efforts have been initiated against these new invaders.

Local eradication and control efforts were ongoing for several invasive plants, including saltcedar, arundo, and multiple species of thistles, brooms, grasses and knapweeds. There is an ongoing effort to manage yellow star thistle (*Centaurea solstitialis*) in the Sierra Nevada Mountains through a containment line extending the length of the range roughly at the 4,000 foot elevation zone.

In 2011, California's fiscal crisis directly affected the ongoing efforts at controlling invasive plants. Because of state budget reductions, there is no more funding at the state level for invasive plant management activities. This will have a continuing impact beyond 2011, at the local level, as many counties relied to some extent on annual state funding for noxious weed control.

Tamarisk control on San Bernardino National Forest.
Photo: D. Nelson

UCC Crews cutting Arundo. Cajon Wash, November 2011.
Photo: D. Nelson, San Bernardino NF

Contacts and Additional Information

If you have questions about forest insect and disease activity in California, please contact personnel in one of these regional or field offices:

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California Forest Pest Council