

Drought increases need for forest thinning

By Susie Kocher

Lake Tahoe's forests are beloved by many for their beauty. Yet they are vulnerable. Tahoe forests, like those throughout the Sierra Nevada, have lost much of their resilience due to overcrowding caused by a century of fire suppression.

The number of large trees in the Sierra Nevada has decreased by half while small trees have doubled since the 1930s. There are nine times as many dead standing trees and three times as many logs on the ground than in 1929. And, the dead wood in the forest today is smaller and more flammable. As a result, the percentage of forests burning at high severity – where most mature trees are killed – has increased dramatically, from roughly 5 to 10 percent a century ago, to more than 40 percent in the 2013 Rim Fire and the 2014 King Fire.

Conditions are exceptional this year as we enter our fourth year of drought. The wildfire forecast is bleak. And we are currently experiencing a die off of trees in the Sierra. In April, the U.S. Forest Service conducted aerial surveys of over 4 million acres of forest in the southern Sierra (from Sonora south) and found that 20 percent was covered with trees killed by insects, totaling over 10 million dead trees.

Mortality was especially severe in pines at lower elevations in the foothills. Surveyors found 5 million dead trees on the Sierra and Sequoia national forests. Conifer mortality was much less at higher elevations though surveyors said it was too early in the season to be certain.

The insects killing trees in the Sierra are all native insects that are multiplying because of drought conditions. Native insects are a necessary part of the forest ecosystem that

speed decay of wood, prey on other insects, and provide food for wildlife. They are normally present at low levels and cause tree mortality only in localized areas.

However, drought weakens trees and reduces their ability to withstand insect attacks. Normally trees use pitch to repel beetles trying to burrow through the bark. Weakened trees cannot produce the pitch needed to repel beetles, which allows beetles to tunnel in and lay eggs that turn into larvae that feed on the inner bark. Attacking beetles release chemicals called pheromones that attract other beetles until a mass attack kills the tree.

In the Tahoe basin, there are three predominant trees, white and red fir, which are vulnerable to the Scolytus beetle and Jeffrey pine which is vulnerable to the Jeffrey pine beetle. These beetles typically take a year to reproduce but two generations may be produced in warm years without much of a winter. Once a tree is killed, emerging beetles tend to attack the next closest green trees, causing group kills that enlarge every year until the epidemic collapses. This is what happened in the Tahoe basin during the multi-year drought of the early 1990s when many Jeffrey pine were killed.

Since spring arrives later in Tahoe and the drought is generally not as severe here, we don't yet know whether local forests will experience the bark beetle outbreaks occurring south of here and at lower elevation. However, an upswing in beetle activity has been noted by area foresters, particularly in larger trees growing in higher densities.

The best way to protect forests from wildfire and insects is to thin them out. Widely spaced trees are healthier and less susceptible to bark beetles since they face less competition for moisture, light, and nutrients compared to densely growing and overcrowded trees. Thinning forests and reducing surface fuels is also the best way to reduce the impacts of wildfires and increase the chances the fire can be suppressed before

getting out of control.

Government agencies and fire protection districts within the Lake Tahoe region have been working together to reduce fire hazards and improve forest health in the basin for many years. Thinning to remove overcrowded trees and surface fuels has been done on 36,890 acres of public forests since 2008.

Fire and forest management agencies goals this year include thinning of 3,765 acres, about half by hand with tools and the other half with heavy equipment. Prescribed burning is planned on about 4,900 acres – about 85 percent of that is burning piles of dead wood from previous thinning activities. Chipping to reduce fire risk is planned on 1,175 parcels. Almost 6,000 defensible space inspections of private property are planned.

In addition, the U.S. Forest Service is responding to current insect outbreaks at Tahoe. They removed several very large Jeffrey pines in the Kiva beach area this spring that were successfully attacked and killed by Jeffrey pine beetles last year. Foresters plan to conduct a survey of all developed recreation sites this fall to identify trees killed this summer for removal over the winter.

Lake Tahoe is celebrating Wildfire Awareness Month in June. Keeping Tahoe forests healthy by thinning and removing beetle infested trees is one key way to prepare for wildfire and improve the odds that Tahoe communities will survive the next wildfire.

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