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Plagues of beetles add to California forest fire danger

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By PETER HUCK

Six months ago a huge bushfire swept across the steep slopes of the San Bernardino National Forest outside Los Angeles, one of several conflagrations that destroyed 299,500ha of pine forest in Southern California, the most destructive fires in the state's history. Today, lush grass, spring flowers, and emergent chaparral cover the forest floor beneath blackened pines, as the forest begins to recover.

But the discerning eye will note a disturbing sign. Vast hectares of dead or dying timber remain, devastated by an unprecedented bark beetle infestation that the authorities are powerless to stop.

Fire officials believe that only 7 per cent of the infected pines, estimated as 12.5 million out of a total of 35 million trees in the forest, were consumed last November, leaving an enormous reservoir of fuel for future blazes.

The forest's 36,000ha of beetle-blighted trees ring the mountain communities of Big Bear and Lake Arrowhead. Some fear a catastrophe is inevitable. "I think it's already too late," says Richard Minnick, chairman of UC Davis' Earth Sciences department, of Lake Arrowhead: "There's probably going to be a fire, when the Santa Ana winds blow this fall, that will probably consume the town."

This ominous prospect resurfaced last week as firefighters battled blazes elsewhere in the region, during which thousands of residents fled. Several fires were burning involving a total of 16,000ha in the state, from eastern San Diego County to Yosemite National Park.

Record temperatures and dry conditions compounded the problem, as officials advanced California's fire season by three weeks.

Historically, fire has kept the American West's vast forests healthy, consuming dead trees and killing pests. But aggressive fire suppression has created over-dense stands.

Arrowhead's natural density is 100 trees a hectare; instead 300 to 500 trees are common and copious fuel, as thirsty trees suck the ground dry. Add California's deepest drought for 250 years and you have a firestorm waiting to happen.

Crucially, this man-made imbalance has altered the forests' reciprocal relationship with the bark beetle. The insect has coexisted with pines for millions of years, eating infirm trees to keep forests healthy. Vigorous pines survive by drowning the beetle in sap.

But as the drought bites throughout the American West - Arizona is reeling from a 1000-year dry - over-crowded forests become stressed. Beetles bore into the tree's core, consuming essential nutrients. Each insect emits a scent that triggers a domino effect, attracting more beetles. Once a forest cleanser, the beetle has morphed into a hungry predator.

"We've never seen anything like this, in such massive proportions," says Minnick of the infestation. "This is an unprecedented outbreak."

To date, forestry workers have tried to stop the beetle epidemic by felling dead trees, an expensive and daunting process given the scale of the problem. "There are two things that naturally stop the beetle," says Reese Halter, president of Global Forest Science, who has just petitioned Governor Arnold Schwarzenegger to use prison inmates for emergency tree thinning. "Fire and cold temperatures."

Alas, fires are suppressed, while high temperatures have evaporated California's snow pack, which customarily recharges mountain watersheds and vegetation later in the year, far earlier than usual.

Besides California's beetle blight and similar outbreaks in the Southwest, British Columbia has been hit by a huge beetle infestation, while the US Southeast's loblolly pines (ironically, seen as a possible "global sink" to absorb carbon dioxide should the US ever ratify the Kyoto Accords) have also been battered by beetles.

These plagues are mirrored elsewhere, not least by Sudden Oak Death (where phytophthora, the fungus that caused Ireland's potato blight in the late 1840s, has killed numerous Californian oaks, although this outbreak is airborne - no one knows why), and by an insect-borne pathogen that threatens the state's viniculture.

Could climate change be upping the ante? Minnick is sceptical, insisting that data "is not very convincing" and that only hindsight will tell.

He suggests warming could mean the planet is merely emerging from the little ice age.

But Halter says studies show that plant species, such as the white spruce, are migrating to higher latitudes and altitudes. Most intriguingly, he notes warm weather has caused bark beetles in BC which normally breed every two years to reproduce twice in one year.

"The beetles are opportunistic," he says. "Breeding is speeding up."

In short, climate change may be opening up new variables. The most frightening thing is the alacrity with which this is happening, says Halter. "It's incremental. Then it gets to a tipping point and - boom."