

This disease is killing California trees by the millions, but scientists urge against giving up



Eel Rock, Calif., where trees infected by Sudden Oak Death are seen among healthy, unaffected trees. Symptomatic California bay laurel leaves generally precede oak and tanoak infections, and are often the first sign that Sudden Oak Death is in a location. This is on the northern coast of California, where disease is still fairly active as they really haven't suffered much from drought. Sudden Oak Death is a tree disease caused by the plant pathogen *Phytophthora ramorum*. (Dan Stark, UCCE Humboldt and Del Norte Counties)

Earlier this month, we learned some bad news about the phenomenon of "sudden oak death," which has killed more than 1 million majestic oak and tanoak trees in coastal California. Researchers writing in the influential Proceedings of the National Academy of Sciences [published results](#) suggesting that although the pandemic, caused by the invasive water mold *Phytophthora ramorum*, could perhaps have been halted a little more than a decade ago (it was first detected in the state in 1995), that basically can't happen now. The disease is too entrenched.

That's very bad news — but some of those same researchers, and other scientists focused on the disease, are now urging citizens and governments not to take the wrong message from this research. There may be no way to eradicate the devastating disease any longer, they say, but that doesn't mean people should despair — or that they should stop trying to fight it, because a lot of forest can still be protected and saved. Furthermore, slowing the spread of the disease could at least buy time and preserve some vital trees until new solutions present themselves, these experts say.

Matteo Garbelotto, who directs the forest pathology and mycology lab at the University of California at Berkeley, says the new research — and articles written about it, including [one here](#) — had an unfortunate result: causing people, including volunteers involved in trying to track and counter sudden oak death, to seem to give up hope.

Garbelotto agrees that when it comes to many marauding invasive species, “by the time we as humans decide to do something, and get our acts together, it's almost too late.” So he doesn't dispute the basic finding of the new study – just the incorrect implication that there's nothing to be done any longer.

“The reality is, even if it's unstoppable, we have been doing research for 15 years to come up with prescription and management guidelines to slow down the spread,” says Garbelotto, who runs a citizen science program, called the [SOD \(Sudden Oak Death\) Blitz Project](#), in which volunteers venture into forests, collect leaves and document the location of the disease.

This can save a great deal of trees, because it gives a sense of where the pathogen is — and which trees will be the next ones to be at risk. The program has even created a [mapping app](#) that lets people see where there's a risk of sudden oak death, and where there isn't.

Awareness is key, Garbelotto says. “Basically, you can go from the disease wiping out up to 70 percent of the oaks in an area, where it arrives, to an outbreak where we only wipe out 10 to 20 percent of the oaks,” he says. Scientists control the disease by cutting down diseased trees, and also those that can transmit the disease.

“If we do something now, aggressively, there will probably be oaks and tanoaks for a long time in specific areas, where by one way or another, they mobilize the effort to eliminate hosts, and especially diseased, individuals,” adds Daniel Simberloff, an expert on invasive species at the University of Tennessee at Knoxville. Simberloff says there's a broader lesson here — we need to catch invasive species much faster and fight them much harder early on, before they reach the extent seen in the case of sudden oak death. But, still, that doesn't mean actions *now* are futile.

The authors of the new paper in PNAS don't seem to disagree — they, too, think there is much that can be done to combat the disease, even if it is now entrenched. In a statement, Richard Cobb, a post doc at the University of California at Davis, and one of the study's authors, put it this way:

█ A new study ... in the journal PNAS shows that most of California's tanoak forests are at risk of high

mortality, threatening an important source of carbon storage, water for millions of people, and the most important acorn source for California Native Americans and a host of wildlife species. ... A loose coalition of engaged citizens and public land management agencies have been working to map the spread of the disease, prioritize specific areas for interventions, and test new approaches for mitigating the impacts of an impending, but avoidable devastation of many forests. Cutting funding for treatments to address forest health issues are often justified by limited resources and a discouraging pattern of demanding that projects meet unrealistic goals that run counter to scientific understanding are often demanded of forest managers. Our study shows that sudden oak death cannot be eradicated from California, but in stark contrast to these conclusions, many effective and innovative actions are underway throughout the state to reduce disease spread and lessen the impacts.

The statement continues:

We must confront the uncomfortable fact that substantial forest mortality from drought, bark beetle, and invasive diseases are a reflection of our changing climate and biosphere. But citizens, scientists, and policy makers cannot allow our collective judgment to be clouded by the difficulty of realizing healthy and resilient forests. Millions of Americans rely on forests as sources of water, wood, and many aspects of well-being. Even more so, millions of taxpayer dollars have been focused on developing actions that improve forest health. Ignoring these insights, walking away from years of scientific advances, and throwing away a focused effort by thousands of engaged citizens is an even greater threat than these dreadful invasive pathogens.

Simberloff adds another point: If the invasive pathogen can be slowed down long enough, then it's possible that trees themselves could find an evolutionary solution to battling it — or that scientists might be able to find a biological weapon against the disease. One strategy for fighting invasive pest species has often been “biological control” — introducing another organism that fights the invader.

“There's many success stories for biological invasions, where invasions have been slowed, or stopped, or managed, or eradicated in some cases, and there are new technologies being used,” Simberloff says.

So there are no grounds not to act, and still reason to hope. But what appears to have happened in this case is a classic example of the chronic disconnect between science and the public.

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Members of the public heard the bad news about sudden oak death (and it is bad news) but then wrongly inferred that the technical statement — that the disease cannot be stopped or eradicated — means there's nothing that can be done about it. But that is simply incorrect.

“Clearly, what was widely accepted by the science community – this pathogen cannot be eradicated – was not well understood by the public,” Cobb says by email. “While this is painful and frustrating for many people, [it’s] also essential that we move beyond eradication as a management strategy – our analysis clearly supports that change in approach.” Rather, he says, the goal now must be to slow the disease and lessen its impacts.

What’s also important here is to train ourselves not to accept simple, uncomplicated answers. A forest disease can be both unstoppable and yet worth fighting. Climate change is already upon us, but decisions made today will still control, to a large extent, how bad it gets in the future.

There’s a lot of bad news in the world — but it’s still ultimately up to us what we decide to do about it. And the project of finding out where sudden oak death is occurring, and reporting that to scientific and government authorities, still matters a great deal.

“That is our challenge, how do I get to people, and how do I educate the public not to come to me after the milk has been spilled, and that’s normally what happens,” Garbelotto says.