

'We dodged a bullet.' Sequoias believed largely spared by California's KNP Complex Fire

By Marek Warszawski

Merced Sun-Star, Friday, October 15, 2021

Twice during the last three weeks, I've nearly made Christy Brigham burst into tears.

Neither time on purpose, just to be clear. I was simply asking Brigham, chief scientist at Sequoia and Kings Canyon National Parks, about giant sequoia groves burned by the KNP Complex Fire, which has scorched nearly 88,000 acres and is 45 percent contained.

"I'm a crier," Brigham said by way of explanation. "I cry over the sequoias."

The first time occurred during a phone interview about the parks' prescribed burning program and the fate of Muir Grove, a place dear to both of us.

Wednesday, it happened again. Except in this instance we were speaking face to face at Redwood Canyon Overlook along the Generals Highway — and others along on the media tour were listening in and recording the conversation.

This time, I made the mistake of asking Brigham if she is more encouraged or less encouraged by what she's learned over the past week about how Redwood Mountain Grove and its 5,500-plus mature giant sequoias fared in the fire.

Brigham responded by recounting the horrific evening of Oct. 4 when, from the front porch of her Three Rivers home, she watched a large pyrocumuliform cloud form over Redwood Canyon. (This is when her voice began to break.) The next day, she saw a photograph of freshly charred sequoia foliage discovered several miles away near Hume Lake.

At that point, Brigham had reason to fear the worst. However, based on the latest intel, the parks' chief of resource management and sciences since 2015 is now optimistic that Redwood Mountain Grove and others were not overwhelmed by high-intensity flames. The kind that has killed thousands of giant sequoias since 2015.

"We dodged a bullet, that's how I feel," Brigham said. "Because of weather and previous prescribed burning and some really hard work by the crews on this fire, we did not see the damage that we would have if that work had not been done."

Extreme giant sequoia damage limited

Sequoia and Kings Canyon National Parks are home to 36 giant sequoia groves, roughly half of all the giant sequoia groves on Earth. Sixteen are inside the KNP Complex Fire footprint, but aerial surveillance footage taken Tuesday under clear conditions showed only four (Redwood Mountain, Suwanee, Muir and Castle Creek) experienced what Brigham termed "high intensity crown fire."

Furthermore, the damage appears to be localized to specific portions of those four groves and not widespread throughout them.

Regarding Redwood Mountain Grove, a popular hiking area, Brigham said photos and video showed many large monarch giant sequoias with their rounded green "broccoli tops" still intact. But there were also areas lower in the grove where destructive fire got into the tree canopies.

"I saw a photo of two large monarchs that were completely torched," she said. "Not a needle on them."

Brigham cautioned her observations are preliminary. Park scientists won't know for certain how those giant sequoia groves fared until next spring or summer when they can safely access them on foot.

"We do not know anything definitively," said Brigham, as smoke from the fire's remaining hot spots wafted in the distance. "Sequoias are mysterious creatures. They've survived thousands of years. So it's going to take a lot of work to know exactly how many sequoias died."

Brigham has seen more than her fair share of that. In June, she and U.S. Geological Survey forest ecologist Nate Stephenson co-authored a report stating last year's Castle Fire in Sequoia National Park

and the Giant Sequoia National Monument killed between 10% and 14% of all large sequoias “across the tree’s natural range in the Sierra Nevada.”

Their startling findings prompted the formation of the Giant Sequoia Lands Coalition, an effort between government agencies, private landowners and affiliated nonprofits to better protect these majestic trees across jurisdictional boundaries.

“It’s a very scary change”

Brigham’s affection and concern for giant sequoias was evident throughout Wednesday’s tour. At one point she likened their 12-to-18-inch-thick bark to “a big ol’ shaggy dog.” At another, she compared their fire resiliency to that knight in the Monty Python flick who keeps getting his limbs chopped off while insisting he’s fine.

“It’s just a flesh wound,” I chimed in.

“Exactly — it’s just a flesh wound,” Brigham replied with a grin. “That’s these trees.”

Giant sequoias actually require low- and moderate-intensity forest fire for the species to propagate, a service that lightning or indigenous people used to provide. However, following a century’s worth of fire management practices that left forests overloaded with fuel, combined with the effects of drought and climate change, wildfires are burning hotter than before and leaving more destruction in their wake.

Even to trees once believed to be practically impervious. Until the 2015 Rough Fire, Brigham said, it was common to see giant sequoias survive despite having 90 percent of their crowns scorched by flames. That is no longer true.

The Rough Fire was also the first time she and her colleagues observed a giant sequoia get “torched” — meaning completely burned from the inside out.

“It is getting scary,” Brigham said. “These are one of the most fire adaptive organisms on Earth. It’s a very scary change.”

Although authorities believe they’ve wrestled enough control of the KNP Complex Fire to keep it from expanding, Brigham still frets about a remote giant sequoia grove along the Middle Fork of the Kaweah River that could be at risk.

“I’m a worrier,” she said. “I worry about the trees.”

Be thankful somebody like her does.

‘Self-serving garbage.’ Wildfire experts escalate fight over saving California forests

By Ryan Sabalow and Dale Kasler
Merced Sun-Star, Thursday, Oct. 14, 2021

As the Caldor Fire roared into the Lake Tahoe basin more than a month ago, Brian Newman took some comfort in the surroundings.

An operations section chief with Cal Fire, Newman knew that thousands of acres of trees and brush had been deliberately removed from around the basin in recent years.

He and other firefighters said the work helped level the playing field, turning imminent disaster into one of the most dramatic success stories of the 2021 wildfire season. On the night of Aug. 30, as the fire exploded in Meyers and Christmas Valley, firefighters saved hundreds of homes and businesses. No buildings were lost.

“Obviously, the fuel reduction and the thinning played a part — a large part,” said Newman, who patrolled that night in a Cal Fire pickup.

But Chad Hanson, an influential environmentalist with a Ph.D. from UC Davis, looked at the Caldor Fire and drew a different conclusion: Forest thinning didn’t work. In fact, it probably made things worse, by

removing shade and exposing more of the woods to the ravages of climate change. A thinner forest meant less of a natural “windbreak” that could have slowed the fire’s progress.

“This is not stopping fires, because they’re mostly driven by weather and climate,” Hanson said. “You can’t fight the wind with a chainsaw.”

Hanson, who runs an organization called the John Muir Project, is a published author who’s often featured in news stories on fire and forestry issues. He’s also spent decades pursuing lawsuits against the U.S. Forest Service over plans to cut down trees to reduce fire dangers. His efforts have sometimes prompted delays in thinning projects and even forced the government to leave more of the woods untouched.

“We go to court to stand up for science,” Hanson said.

But over the past few years, as California has endured record-breaking wildfires, a legion of fire scientists is delivering a blunt message to Hanson and other environmentalists who oppose forest thinning: Get out of the way.

In an extraordinary series of articles published in scientific journals, fire scientists are attacking Hanson’s and his allies’ claims that the woods need to be left alone. These scientists say the activists are misleading the public and bogging down vital work needed to protect wildlife, communities and make California’s forests more resilient to wildfire.

“I and my colleagues are getting really tired of the type of activism that pretends to be science and in fact is just self-serving garbage,” said Crystal Kolden, a professor of wildfire science at UC Merced and co-author of a journal article that rebutted Hanson’s arguments.

“If a lot of these environmental groups continue to stand by these antiquated and really counterproductive viewpoints, all we’re going to see is more catastrophic wildfire that destroys the very forests that they pretend to love.”

Battles over the management of America’s forests have been raging for more than a century, starting when President Teddy Roosevelt set aside millions of acres of public land in 1905 to be managed by a new agency, the Forest Service.

For decades, environmentalists fought the agency for allowing timber companies to pillage huge stretches of the national forests for profit. Hanson says thinning projects, performed in the name of fire safety, are simply an excuse for more of the same commercial logging.

But climate change is making the forests hotter and drier — at the same time they’re getting increasingly populated with humans. That has sharpened the debate over how best to manage California’s woods. And with another 2.4 million acres burning in California this year, on top of 4 million in 2020, many other environmental organizations have embraced thinning as a means of saving America’s forests.

In July, a coalition of 15 groups, from Defenders of Wildlife to The Nature Conservancy, urged new Forest Service chief Randy Moore “to markedly increase ecologically-based forest treatments.”

Momentum is building among elected officials. Congress is debating whether to hand the Forest Service billions of dollars for aggressive forest management, as part of President Joe Biden’s stalled infrastructure plan. The California Legislature recently appropriated nearly \$1 billion toward thinning and pre-planned “prescribed fire” to clear undergrowth.

“When you just see what’s happening out the window right now, with the number of fires we’re experiencing ... there’s a real political movement to (act) on some of this decisively,” said Scott Stephens, a UC Berkeley wildfire scientist and one of Hanson’s critics.

Spotted owl habitat burned by red tape

Few forest thinning battles illustrate the problem better than a 9,310-acre forest-thinning project planned for the Klamath National Forest near the Oregon border.

Environmental groups spent a decade objecting to the proposal, labeling a portion of the project as a thinly disguised “timber grab” that would destroy spotted owl habitat.

Amid objections from the Klamath-Siskiyou Wildlands Center and others starting in 2011, the Forest Service produced more than 570 pages of environmental reviews, botanical reports and other planning documents for the so-called Pumice Project.

While tied up in environmental red tape and other bureaucratic delays, the Antelope Fire in early August burned through the site before a single chainsaw touched a tree, destroying the owl habitat that the environmental groups were trying to save.

“We’re putting our limited time and resources into kind of bulletproofing these documents,” said Drew Stroberg, a district ranger in the Klamath forest. “On the Pumice Project, we’ve worked hard on a lot of those documents and gone around and around and around. And, now, they might as well be in the trash can.”

Hanson and other environmentalists continue to fight other forest thinning projects around the state.

In June, Hanson submitted a written declaration in a lawsuit protesting the Forest Service’s plan to remove “hazard trees” — conifers damaged by drought, bark-beetle infestations and a 2002 fire — along miles of Sherman Pass Road in the Sequoia National Forest, one of the main thoroughfares through the region.

The agency said the dead, dry trees could ignite a major wildfire. They could fall on power lines, the ignition source for many of California’s most deadly fires in recent years. Arguing that there was “an urgent need for this project,” the agency had bypassed the usual in-depth environmental reviews and swiftly approved the project.

But Hanson, citing some of his own published studies, argued that the project would ruin extensive habitat that was teeming with “Pacific fishers, spotted owls, black-backed woodpeckers and other species.” He added: “I enjoy being in forests in a natural state, and a logged environment ruins that enjoyment.”

In July, a federal judge in Fresno granted a temporary restraining order that has prevented the Forest Service from cutting down some of the trees. Judge Dale Drozd limited the agency to removing trees “within striking distance” of the road until environmental studies can be conducted.

Those studies could take years — a period in which Forest Service officials say the forest will grow hotter, drier and more dangerous as climate change intensifies.

“Leaving excessive fuel load along Sherman Pass Road would cause the next wildfire to burn more intensely — making it more difficult for firefighters to suppress,” the government’s lawyers said in a written court filing.

‘Agenda-driven science’ and misleading conclusions

In the polite, jargon-filled world of scientific literature, it was an astonishing attack.

Two years ago, in the journal *Frontiers in Ecology and the Environment*, a group of academics wrote an article titled “Agenda-driven science? The case of spotted owls and fire.”

The piece accused Hanson and two of his collaborators of abandoning scientific norms as Hanson’s group argued against the need to thin the forests to reduce wildfire risks. Hanson’s group also opposes the harvest of timber killed by wildfires.

In this case, the authors said Hanson; Derek Lee, a professor at Penn State University; and Monica Bond, a biologist with the Wild Nature Institute; used “agenda-driven science” to create misleading conclusions about the harms that wildfires do to spotted owl habitats.

Among other things, the authors said Hanson and his colleagues excluded data that didn’t support their beliefs — and pushed a scientifically unsupported narrative that could lead to more harm to the owls if fires are allowed to rage unchecked through their territory.

“Ignoring negative effects of severe wildfire could compromise the ability to conserve this species and restore forest ecosystems that are experiencing increasingly large and severe fires as the climate becomes warmer and drier,” the nine authors wrote.

This summer, a different group of academics went after Hanson. In three recent articles in the journal *Ecological Applications*, Kolden, Stephens and other co-authors made the case for more forest thinning, and in the process ripped Hanson and his allies' methods and results.

Hanson's group has "garnered substantial attention and fostered confusion about the best available science," they wrote.

All told, Keala Haggmann, a research ecologist at the University of Washington and a co-author of one of this summer's articles, said at least 111 scientists have co-authored at least 41 scientific papers that rebut Hanson's and his colleagues' arguments.

Susan Prichard, a University of Washington fire ecologist and lead author of one of the recent articles that rebut Hansen's positions, compares Hanson and his allies to early climate change deniers.

The deniers, she said, received outsized media attention, and made it seem as if there was a scientific debate when in reality an overwhelming majority of scientists insisted climate change was a pressing threat.

"It's jaw-dropping," Prichard said. "Because for those of us that are in the field, we have this sense of everyone's in pretty close agreement, and that the science is settled."

Hanson said he isn't surprised by the attacks. He denies the allegations about using data improperly. He says his critics are beholden to the Forest Service, which funds some of their research, and they're upset that his work brings to light information that exposes the agency's shortcomings.

"We're producing objective, highly credible, really inconvenient data with regard to the Forest Service's logging program," he said.

Forest Service 'legacy of distrust'

California is home to 33 million acres of forestland. Each year, between state, federal and local agencies, about 500,000 acres of forest is treated with some combination of logging, chipping small trees and brush and deliberate burning.

Fire scientists are careful to note that they're not advocating for returning to the destructive forestry practices of decades past, when the Forest Service effectively handed the woods over to the logging companies to cut down the largest, most profitable trees without thought to the ecological consequences.

And they say the thinning projects they want to see done on a much larger scale aren't appropriate for every habitat. For instance, they say there's not much you can do to prevent fires from raging through much of fire-prone Southern California, where powerful winds push flames through brush and chaparral.

Nor will so-called forest "fuels treatments" keep fires from burning.

"The goal of these treatments is not to stop wildfires in their tracks. It's to change the behavior where we can," said Dan Porter, the California forest program director at The Nature Conservancy, which has worked with the Forest Service on thinning the projects in the Sierra.

But fire scientists say that in much of the Sierra and in the other forests elsewhere in dry inland Northern California, the woods are in terrible shape, due in large part to a century of aggressive logging and fire suppression.

Before the Gold Rush, California's forests were dominated by trees large and sturdy enough to survive wildfires that burned through the woods every decade or so — started by lightning or the region's Native American tribes.

The fires burned with far less intensity than today's infernos. They cleared the undergrowth, and the downed limbs and pine needles.

All that changed when white settlers arrived. First off, they extinguished native peoples' practice of setting fires. And then, in the early 1900s, the newly-formed Forest Service implemented a hardline policy bent on putting out all wildfires as quickly as possible to protect the timber that loggers were sending to the mills. The agency reigns over 20 million acres of national forests in California, about one-fifth of the state's total landmass.

Across California, much of the sturdy old-growth was cut down, and what grew back in its place were dense stands of small trees and brush. The stage was set for an era of catastrophic fires like the sorts California is experiencing every summer.

The sorts of clear-cut logging that ravaged California's forests under the Forest Service's authority last century has given environmentalists plenty of reasons to question the agency's motivations.

"There's a legacy of distrust," said Prichard, the University of Washington fire ecologist.

Prichard said Hanson and other environmentalists are exploiting that history — and fears of a new era of clear-cutting — to sell their misleading arguments.

"They're kind of taking a page out of the fake news playbook," she said. "I really feel like they're preying on people's hunches."

When today's fires strike, they hit dense stands that have been dried out by drought and a warming climate, sending flames ripping through the undergrowth to turn even the tallest, healthiest of trees into torches.

To restore the forests, fire scientists say California needs to begin aggressively sending crews into the woods to clear out the smallest trees and brush below what big timber is left. And then the state needs to embrace what the Indians did: Set fires every few years or let the fires that ignite naturally do the work of thinning the brush and small trees that grow back.

Some say the Forest Service has been slow to adopt this model. During a recent visit to the Mendocino National Forest with Gov. Gavin Newsom, U.S. Agriculture Secretary Tom Vilsack apologized for the Forest Service's practice of "robbing Peter to pay Paul" — taking money from forest management projects to pay for firefighting. He said the agency will do better if it gets more funding from Congress.

The Karuk Tribe, in the Klamath region near the Oregon border, is among the Native American groups with a long list of complaints about fire and forestry management. In a letter to the agency last fall, they said the Forest Service was dragging its feet on conducting "prescribed fire" — pre-planned burns aimed at clearing out brush and undergrowth. And they said the agency was denying tribal members the right to become "burn bosses" — the people who oversee these pre-planned fires.

A year later, tribal leaders see some progress. Bill Tripp, the Karuk Tribe's natural resources director, said Forest Service officials have agreed to use Karuk members as burn bosses, and pledged to permit more prescribed burns.

Kolden, the UC Merced fire scientist, has this to say about the environmentalists who argue for a hands-off approach to the forests:

"This suggestion that we shouldn't manage anything because the forest takes care of itself is a completely racist and very, you know, colonial viewpoint that ignores the thousands of years of extensive and intensive indigenous landscape management across California and the West."

Forest management tied up in court

Hanson co-founded the John Muir Project in 1996. The organization is based in Big Bear City, east of San Bernardino, and operates under the umbrella of the Earth Island Institute, a Berkeley nonprofit that took in \$16 million in donations and other revenue in 2019.

The 54-year-old Hanson holds a law degree but isn't a lawyer, sometimes leaving the legal work to his wife, Rachel Fazio, the staff attorney at John Muir. He's become a prominent advocate on the environmental left, authoring numerous scientific journal articles of his own.

Hanson says he has plenty of allies in the scientific community. He cites a letter he and 200 other environmentalists, ecologists, biologists, botanists, climatologists and other scientists sent Congress last year opposing logging as a solution to major fires. The group also included a forest ecologist from the University of Minnesota and fire scientist at the University of Idaho.

"Reduced forest protection and increased logging tend to make wildland fires burn more intensely," they wrote.

His critics dismiss the letter as evidence that Hanson isn't really in the mainstream. Among those who signed it, it's lacking "key people in this area of fire and forest science," Stephens said.

What's more, they said the timber industry-supported proposal to which Hanson's group was objecting had little to do with the sorts of work needed in California's fire-prone forests.

Kolden said "the logging industry has co-opted the word 'thinning' " to describe its desire to "cut down big trees that don't burn much" in the damp forests of the Pacific Northwest. "Fuel treatments for restoring forest health and resilience are completely different," she said.

Hanson's recent writings are an acknowledgment that his crusade against the scientific establishment is a somewhat lonely endeavor. In a chapter written for an environmental book published earlier this year, he and two of his allies said any scientist who challenges the status quo will be attacked by people wanting to "smear or discredit you." A semi-autobiographical book he published this year is titled "Smokescreen: Debunking Wildfire Myths to Save Our Forests and Our Climate."

Hanson argues that thinning removes a lot of thick, old-growth trees that are fairly resilient to fire. What's left is small trees, saplings and seedlings that ignite like kindling.

True fire safety, he says, is largely about making homes and communities more resilient through strict building codes and "defensible space" regulations that require homeowners to clear their properties of vegetation. He said defensible space, not large-scale forest thinning, saved Christmas Valley and Meyers from the Caldor Fire.

'An honorable thing to work to protect wildlife habitat'

Federal laws — particularly the National Environmental Policy Act and the Endangered Species Act — give Hanson and those who share his views the ability to delay projects for years.

Some critics say the environmental review process has been weaponized by activist groups to drag out worthwhile projects, even if a judge eventually sides with the government.

Few are more effective than Denise Boggs, a 61-year-old white-haired environmentalist from Rohnert Park who lives part-time in Montana because, she says, she can't afford to live year-round in California.

The head of a group called Conservation Congress, Boggs isn't as well known as Hanson but is considered a tenacious advocate against forest thinning.

"To me, it's an honorable thing to work to protect wildlife habitat," she said.

She spends as much time as she can in the forests — "they're all so beautiful and they all have something to offer," she said — and she's diligent about filing detailed written protests with the Forest Service over thinning projects.

When she can't get the agency to cooperate, she sues — a total of 15 cases since she founded Conservation Congress in 2004.

"I hate lawsuits," she said. "I only file them as a last resort."

Indeed, lawsuits against the Forest Service are rare. Of the 126 thinning projects approved in the past three years in California, "the vast majority of our vegetation and fuels projects are at various stages of successful implementation and are not involved with lawsuits," said agency spokeswoman Regina Corbin in an email.

Nonetheless, the agency listed seven lawsuits filed in the past three years over proposed thinning projects, from the Klamath National Forest on the Oregon border to the Los Padres outside of Santa Barbara.

Sometimes the litigation can last years.

In 2013, Conservation Congress sued the Forest Service over the Pettijohn project, which was designed to thin out a 21,000-acre parcel of the 2.2 million acre Shasta-Trinity National Forest about five miles northeast of Weaverville.

Soon after, the agency got the court's permission to put the lawsuit on hold while it could re-examine the project's potential on spotted owl habitat.

Five years went by, while the Forest Service studied the owl population with the federal Fish and Wildlife Service. Finally, the Forest Service acknowledged that the owl population in the Pettijohn area was larger than originally believed. It agreed to downsize the project, leaving about 1,200 acres of woods untouched.

Boggs continued to litigate over the remainder of the project, but earlier this year a federal judge in Sacramento gave the Forest Service the green light.

Even though she ultimately lost the case, Boggs was pleased that the Forest Service shrank the footprint of the project.

"That is a win," Boggs said. "It looks like you lose even though the work you're doing is forcing them to make better decisions, and sometimes that is the best we can do," she said.

The fact that the lawsuit delayed the project for years? Boggs said the time lag wasn't her fault; it's up to the Forest Service to observe the nation's environmental laws.

"If they had done those things in the first place, I wouldn't have had to file the lawsuit," she said.

"Sometimes the only way you can get them to do the right thing, to follow the law and protect the species, is to file a lawsuit."

Boggs said she regularly receives hate mail and death threats. Conservation Congress took in just \$74,478 in donations in 2019, according to the nonprofit's IRS filing. Boggs, the organization's lone paid employee, earned \$47,000.

"I'm not getting rich off of this," she said. "I've been poor my whole life and I don't expect that to change."

Conservation Congress' finances could be getting even thinner. After the judge dismissed her lawsuit over the Pettijohn project this year, the federal government petitioned to have Conservation Congress reimburse the government for \$16,614 in court costs.

The costs reflect the stunning amount of paperwork that had to be retrieved, reviewed and indexed for the lawsuit: 19,193 pages.

Boggs pleaded with the judge to turn down the request. "Granting an award of this size for a small public interest group would have a chilling effect on groups such as the Conservation Congress, and would likely put us out of business," she wrote in a court filing.

A decision is pending on the court costs. In the meantime, Conservation Congress is still fighting over the thinning project itself: Based on new data about disappearing owl habitat, Boggs said she's demanded that the Forest Service re-examine the planned work. Depending on how the agency responds, Conservation Congress could sue the agency again.

Oases of green in a scorched forest

If thinning is so effective, Hanson argues that the Caldor Fire, for example, wouldn't have reached Tahoe in the first place. Before pouring into the basin, it roared through areas throughout the Eldorado National Forest that had been thinned over the years.

But fire scientists say Hanson, who makes similar claims about other recent California fires, including the Dixie Fire, is again being misleading.

They say that these thinned areas often hadn't been treated again after they were cut — a necessary step to ensure the woods stay in balance. Plus, if the treated areas were surrounded by miles of dense overgrown woods, there's little hope for them when fire is raging on all sides, said Prichard, the University of Washington scientist.

"If we have a lot of fuels on broad landscapes, sometimes these little postage stamp treatments have no chance," she said.

Experts say reducing fire danger usually requires multiple strategies, including making sure the woods are maintained in the years after they've been thinned. Defensible space immediately around properties helped save homes around Tahoe, said Cal Fire's Newman.

And while it's true that the Caldor Fire raced through areas of the Eldorado National Forest that had been thinned, Newman said that proves more work must be done.

"It does work, it's just a matter of we're needing to do it on a much grander scale," he said.

The results of a successful fuels treatment project can be striking.

Around the small Siskiyou County community of Tennant, the Klamath National Forest is a wasteland of scorched trees, a place where no green can be seen for miles. But a few small oases look very different after the Antelope Fire scorched the dry landscape in early August.

In these tiny parcels of federal land, the pines are still mostly green, though they're surrounded by the skeletons of scorched trees that died as 150-foot flames climbed up from the dense thickets of small trees and brush underneath them.

These green pines that survived the 145,632-acre Antelope Fire were no accident.

In those parcels, loggers with chainsaws more than 20 years ago thinned the dense stands of trees that grew back after the pines were almost all cut down in the 1920s and 30s.

The loggers in 1998 left the biggest pines standing, leaving ample space between groups of trees.

Then, after their log trucks pulled out, crews with drip torches set two fires, years apart, to the pine needles, downed limbs and small trees and brush that grew up underneath the timber the loggers didn't cut.

The thinning and burning was part of a years-long research project aimed at seeing how local wildlife responded to thinning projects and prescribed fire like the Karuk and other tribes had practiced on the Klamath before white settlement.

To Eric Knapp, the standing green timber was proof positive that more treatments need to be done across California and the West.

Knapp, a U.S. Forest Service research ecologist, is a co-author of several studies highlighting the benefits of more aggressive fire fuels management.

"To me, it just really illustrates that if you change the fuels," Knapp said, "you change the fire behavior."

Sequoia wildfires see containment grow as crews leave to assist Alisal Fire

By Joshua Yeager

Visalia Times-Delta, Thursday, Oct. 14, 2021

Containment of the KNP Complex Fire in Sequoia and Kings Canyon national parks jumped to 45% on Thursday as crews exit the Sierra Nevada to assist with other out-of-control fires scorching the Golden State, such as the Alisal Fire near Santa Barbara.

California Incident Management Team 2 has assumed full control of the 87,000-acre blaze effective Thursday. The KNP Complex had previously been divided into two zones to help fire managers better contain the wildland fire.

Nearly 1,600 personnel remain active on the KNP Complex.

Containment improved along the fire's northern tip. Tulare County Sheriff Mike Boudreaux on Wednesday lifted evacuation warnings for the popular Grant Grove and the historic Wilsonia communities.

The parks and Generals Highway remains closed to the public as fire crews continue working fire lines and repairing damage to the landscape caused by firefighting efforts.

The fire has scorched at least two giant sequoia groves, but the terrain remains largely inaccessible to firefighters. Until conditions improve, park officials will not be able to determine the extent of damages to

the groves, though scientists speculate as many as 400 monarchs may have perished based on the fire's intensity.

Engines will continue to patrol communities around the fire's perimeter — including Silver City, Cabin Cove and Mineral King — to ensure that buildings remain safe.

"Structure protection groups will be patrolling and monitoring the full perimeter of the fire, focusing on ensuring that previously identified values at risk are still intact and safe, and that suppression equipment is properly winterized," a Thursday incident report stated

Fire managers expect containment to improve through the weekend, though smoke could continue to fill nearby foothill communities.

Firefighters are focusing their efforts on building fire lines between Montecito Lodge and Stony Creek in Sequoia National Forest. This area, firefighters said, is extremely challenging because the terrain is overrun with dead trees.

Also known as snags, dead standing trees pose significant risks to firefighters. Last week, four KNP firefighters were airlifted to Valley hospitals after a tree fell on them, officials said. The firefighters were released from the hospital the next day and are "on the mend."

Gusty winds earlier this week caused massive dust storms across the Valley floor, grounding helicopters and aerial attack crews.

With the winds lifted and visibility restored, helicopters have taken to the air and are focusing remote, unmanned areas of the fire near the Middle Fork of Kaweah River. In other dangerous or inaccessible areas of the fire, firefighters are deploying drones and other unmanned vehicles.

While fire activity has slowed following two winter storms that dusted the Sierra with rain and snow earlier this week, firefighters are reminding the public to stay vigilant and be mindful of heavy equipment as crews exit the fire lines.

"Although fire activity has slowed, safety of firefighters and the public is the top priority. Residents and visitors are reminded to remain vigilant to changing conditions, increased emergency response activity, and changing weather patterns which may impact weakened trees and create additional overhead hazards or ground instability," incident managers said.

California Is Banning Small Engines. Here's What It Means

CARB says there are 16.7 million small engines in the state compared to 13.7 million passenger vehicles, drastically affecting emissions.

By Rob Stumpf

The Drive, Thursday, October 14, 2021

California Governor Gavin Newsom has signed legislation that aims to ban the sale of gas-powered lawn equipment, generators, and other small engines designed for off-road use.

This new law builds from the executive order signed by Newsom in 2020 that bans the sale of new passenger cars powered by internal combustion engines in 2035. In the same order, Newsom calls for "100 percent zero-emission off-road vehicles and equipment," the phaseout of which must now be road mapped by the California Air Resources Board (CARB) in 2022 and officially put in place by 2024.

The text of the signed bill specifically calls for the banning of small off-road engines (SORE), calling out emergency response equipment and generators as well as both residential and commercial lawn equipment.

However, the SORE category expands past the named items. CARB officially defines SOREs as off-road spark-ignition engines that produce 25 horsepower or less. Other equipment examples given by the board include industrial, logging, golf carts, and specialty vehicles. It's not yet clear how this will affect small off-road recreational and sport vehicles like ATVs and dirt bikes, though most exceed that 25-hp threshold.

"Small gas engines are not only bad for our environment and contributing to our climate crisis, they can cause asthma and other health issues for workers who use them," said Assemblywoman Lorena

Gonzalez, a co-sponsor of the bill. "It's time we phased out these super polluters, and help small landscaping businesses transition to cleaner alternatives."

There are currently 16.7 million small engines in California, according to a fact sheet supplied by CARB. That's significantly more than the state's fleet of 13.7 million passenger vehicles. Approximately 77 percent is made up of residential lawn and garden equipment, while federally regulated construction and farming machinery make up 11 percent. The remaining 9 percent is attributed to commercial lawn and garden, which may be hit hardest by this legislation.

These fleets of small engines are responsible for a substantial amount of the state's emissions. In fact, CARB says that running a leaf blower for an hour is equivalent to driving a 2017 Toyota Camry for 1,100 miles.

Marc Berman, author of the legislation, recognizes that the transition to battery-powered equipment will be a hardship for some small businesses. He says that California will pledge approximately \$30 million to aid commercial businesses, but given that there are around 50,000 outfits in the state that'll be affected by the change, that works out to around \$600 each.

According to financial figures supplied to the Los Angeles Times by Andrew Bray, vice president of government relations for the National Association of Landscape Professionals, that simply isn't enough. A gasoline-powered commercial riding mower could cost a business anywhere from \$7,000 to \$11,000, while the zero-emissions equivalents often cost more than twice that.

Equipment cost aside, there are also logistical concerns. For example, Bray believes that a three-person crew would need to carry as many as 40 fully-charged batteries to complete a full day's work. Additionally, these small companies may even need to upgrade their workshops to handle the daily charging of this equipment.

Legislators have their concerns as well. Given California's history of brownouts and power grid problems, some lawmakers like Senator Brian Dahle say that banning critical fuel-based power backup mechanisms like generators makes no sense.

"[Fuel] is very sustainable. It's easy to access. And when the power is off, you can still use it," said Dahle. "You can still run a generator to keep your freezer going, to keep your medical devices going. But when your battery's dead and there's no power on, you have nothing."

California will require that the ARB determine the regulations which will govern small engines no later than July 1, 2022. The adopted regulations will be put in place 18 months later on Jan. 1, 2024.

Q&A: La Nina's back and it's not good for parts of dry West

By Seth Borenstein

The Business Journal, Thursday, Oct. 14, 2021

For the second straight year, the world heads into fall and winter with a La Nina weather event. This would tend to dry out parts of an already parched and fiery American West and boost an already busy Atlantic hurricane season.

Just five months after the end of a La Nina that started in September 2020, the U.S. National Oceanic and Atmospheric Administration announced a new cooling of the Pacific is underway.

La Nina's natural cooling of parts of the Pacific is the flip side of a warmer El Nino pattern and sets in motion changes to the world's weather for months and sometimes years. But the changes vary from place to place and aren't certainties, just tendencies.

La Ninas tend to cause more agricultural and drought damage to the United States than El Ninos and neutral conditions, according to a 1999 study. That study found La Ninas in general cause \$2.2 billion to \$6.5 billion in damage to the U.S. agriculture.

HOW STRONG AND HOW LONG WILL IT LAST?

There's a 57% chance this will be a moderate La Nina and only 15% that it will be strong, said Mike

Halpert, deputy director of NOAA's Climate Prediction Center. He said it is unlikely to be as strong as last year's because the second year of back-to-back La Ninas usually doesn't quite measure up to the first.

This La Nina is expected to stretch through spring, Halpert said.

WHAT DOES THIS MEAN FOR THE WEST?

For the entire southern one-third of the country and especially the Southwest, a La Nina often means drier and warmer weather. The West has been experiencing a two decade-plus megadrought that's worsened the last couple of years.

But for the Northwest — Washington, Oregon, maybe parts of Idaho and Montana — La Nina means a good chance rain and drought relief, Halpert said.

“Good for them, probably not so good for central, southern California,” Halpert said.

The Ohio Valley and Northern Plains could be wetter and cooler. La Nina winters also tend to shift snow storms more northerly in winter while places like the mid-Atlantic often don't get blockbuster snowstorms.

WHAT ABOUT ATLANTIC HURRICANE SEASON?

During last year's La Nina, the Atlantic set a record with 30 named storms.

This year, without La Nina, the season has still been busier than normal with 20 named storms and only one name left unused on the primary storm name list: Wanda.

The last couple weeks have been quiet but “I expect it to pick up again,” Halpert said. “Just because it's quiet now, it doesn't mean we won't still see more storms as we get later into October and even into November.”

La Ninas tend to make Atlantic seasons more active because one key ingredient in formation of storms is winds near the top of them. An El Nino triggers more crosswinds that decapitate storms, while a La Nina has fewer crosswinds, allowing storms to develop and grow.

WHAT ABOUT THE REST OF THE WORLD?

Much of both southeast Asia and northern Australia are wetter in La Nina — and that's already apparent in Indonesia, Halpert said. Central Africa and southeast China tend to be drier.

Expect it to be cooler in western Canada, southern Alaska, Japan, the Korean peninsula, western Africa and southeastern Brazil.

PG&E: About 700 residents in Kern could face power outages Thursday

The Bakersfield Californian

High winds have prompted Pacific Gas & Electric Co. to announce the utility plans to turn off power early Thursday morning to 655 customers and 34 medical baseline customers in Kern County, according to a PG&E in a news release.

The weather conditions, combined with exceptional drought conditions and extremely dry vegetation, could run the risk of wildfires, the company stated.

'You can't just hold your breath.' Toxic smoke, fueled by wildfires, chokes California

By Cresencio Rodriguez-Delgado

PBS NewsHour, Wednesday, Oct. 13, 2021

FRESNO, Calif. — A new analysis of air quality in the United States clears up just how far smoke from wildfires burning in the western part of the nation can travel, as the fires continue to pose significant health risks to nearby communities.

Wildfire smoke produced in the west reached as far east as Washington, D.C., and Philadelphia, increasing the number of smoky days in the east by 40 percent, according to an analysis released in September by NPR's California Newsroom and Stanford University's Environmental Change and Human

Outcomes Lab. Researchers analyzed more than 10 years of data from the National Oceanic and Atmospheric Administration.

While the smoke was dispersed widely, California communities closest to the wildfires have experienced high amounts of air pollution lasting for days in the past two months. In some cases, pollution indexes reached levels unlike any seen before, according to health and education officials who spoke to the PBS NewsHour.

On Monday, an entirely different phenomenon overtook the skies in the San Joaquin Valley. A large dust storm visible from space swooshed through the Valley with winds of up to 40 miles per hour, leaving downed trees and small wildland fires in its wake, and lowering visibility to as low as a mile in some places.

The wind was part of a cold system that developed over the Pacific Northwest and brought some rain earlier on Oct. 8 but later weakened to a dry system. While it helped push out the smoke, winds picked up dust from fields and dry areas in the Valley from as far north as Sacramento down to Bakersfield — areas experts say are historically dry this year.

The smoke and dust that has battered California in recent weeks comes after one of the hottest summers recorded, and as the state experiences extreme drought conditions. Before the dust storm, the National Weather Service's Storm Prediction Center had raised the wildfire threat to "critical" in most of the Central Valley region of California due to the dry conditions.

"As long as we remain with no wetting rain that comes into the Valley, we'll continue to see those dust storms with any dry system that comes through," said Modesto Vasquez, meteorologist with the National Weather Service in Hanford, California.

Recent rain storms in the Sierra Nevada have helped slow the growth of the burning wildfires. For almost a month as the KNP Complex and Windy fires have raged in the Sierra Nevada, air pollution has fluctuated from dangerous particulate matter on some days, and clean blue skies on other days. Together, the fires have burned 185,000 acres as of this week.

'The worst I've seen it'

On a clean air day, the Sierra is visible to the east from any city or town in the Valley. But the smoke creates a wall that obscures the view of the mountains, turns the sky brown and gives the sun a locally infamous reddish hue. Flurries of ash fall like snowflakes onto the Valley, and within days will dust vehicles and street curbs.

At first it's just the sight of another wildfire nearby. But shortly after, patients begin to come in to see doctors.

"The pollution is really so bad that you can literally feel like you are eating pollution," said Dr. Malik Baz, an allergist and immunologist at the Baz Allergy, Asthma and Sinus Center in Fresno. "This is the worst that I've seen it."

Regular patients and new patients have come in through the start of the month with a litany of complaints: a cough, headache or burning sensations in their chest, eyes or nasal passages.

Baz, who has lived and worked in the Central Valley for 40 years, said there has been a roughly 20 to 30 percent uptick in patients in recent weeks, since smoke from wildfires began setting in. Across the Valley, the 14 Baz Allergy offices between Modesto and Visalia sometimes aren't enough to help all the patients. Baz said there isn't enough staff.

"We are trying to see our own existing patients, and some other patients, but a lot of the time we either have to turn away the patient, or we can give them an appointment for the next two or three weeks, which is not the best thing to do, but there is nothing much we can do about it," Baz said.

Last week, as smoke levels were high, monitors from the San Joaquin Valley Air Pollution Control District recorded pollution made up of microscopic particles — known as PM2.5 — reaching levels that are hazardous to all groups of people. The Environmental Protection Agency considers PM2.5 to be one of the most dangerous forms of pollution because the particles, which are fine particulate matter smaller than 2.5 millionths of a meter, are so tiny they can easily pass through the respiratory tract and reach the

lungs and bloodstream. The particles that make up this pollution typically can come from smoke or dust during crop harvests. Monday's dust storm also elevated the pollution levels for a few hours.

Short-term health effects of exposure to PM 2.5 pollution includes eye irritation, sore throat, coughing, sneezing and runny nose, Baz said. Long-term effects include reduced lung function and an increase in deaths from heart disease. Researchers believe the longevity of residents in the San Joaquin Valley is lower because of chronic exposure to pollution.

Questioning health and exercise under pollution

The San Joaquin Valley Air Pollution Control District outlines the risks with each level of air hazard. The agency reports that the amount of PM 2.5 pollution that poses the need for limited time outdoors for people without underlying illnesses is usually below 75 micrograms per cubic meter. Also, sensitive individuals — a category that includes people with asthma, or other heart or lung conditions — are encouraged to exercise entirely indoors under these conditions.

That wasn't the case on Oct. 3, when Fresno recorded 104.6 micrograms per cubic meter of PM2.5 pollution — far above the most unhealthy level for all groups of people. That day, about 1,000 runners raced in the California Classic Half Marathon through downtown Fresno.

Kendra Lopez, 33, said she ran the half marathon as training for the Chicago Marathon that took place Oct. 10. Lopez said some of her friends decided at the last minute the air was too unsafe to run, but she decided to race because she had already practiced in early mornings and under the smoky air.

"I wasn't out there to run fast," Lopez said a day after the event, which she finished in an hour and 58 minutes.

Lopez grew up in Fresno but moved to Los Angeles before moving back to the Valley two years ago, where she has been active in the running community since. Reflecting on the race through the smoke, she said she has always had to make adjustments based on air quality to determine when she could run.

She used to wonder why more people didn't run in the city or around her east Fresno neighborhood, but she now believes year-round pollution along with the sharp rise of particulate matter from the wildfires may be a major deterrent.

"I think when it comes to health and wellness, people want to be outdoors. We've had a hard year, Lopez said. "How come we always have to be in these situations like, 'Well, we want to do these things, but we can't.' And if we do these things, we're obviously risking [our health]."

Dr. Rais Vohra, interim health officer for Fresno County, has considered the region to be "always one disaster away" from a surge in hospitalizations. In COVID-19 briefings, he has addressed the impacts of lingering smoke, saying doctors are worried about the health of the runners or other large groups who may be exposed to the smoke long term.

Baz told the NewsHour that symptoms from PM2.5 exposure are similar to those of COVID-19, and that of a cold or flu, which he said makes it that much more difficult for residents to seek immediate care if they don't know what is causing their symptoms. He called the situation a "triple whammy."

Protecting students from bad air

Preventing exposure to the smoke has become a challenge for officials at schools who now are tasked with making sure students don't breathe in the toxic smoke.

Bryan Wells, assistant superintendent for student engagement in the Fresno Unified School District, said the unusual and fast-changing conditions have made staff and teachers extra cautious during a school year when students are having to relearn how to be back in the classroom, and as teachers also try to protect against COVID-19 infections.

On Oct. 1, the PM2.5 pollution level in Fresno reached 146 parts per billion, way above the most extreme level.

"It was amazing to see how fast we went from a level three to a level five above in an hour," Wells said.

The following week, California Gov. Gavin Newsom visited a Fresno elementary school to sign a \$123 billion education bill. Wells said the event was supposed to be held outdoors, but the smoke still had not improved by the middle of the week and the governor spoke indoors. Earlier that day, Wells had gotten an email from a teacher at 6 a.m. local time already concerned about the air quality level.

Within hours, Wells said, the district moved into a “smoke advisory” day which essentially works similar to a “rainy day schedule” for students. Outside activities were limited and students were kept in classrooms, gymnasiums or cafeterias during their breaks. The district has had to cancel nighttime football games because air pollution reached high levels even during the evening hours.

“In my 35 years in education, it’s never been this bad,” Wells said. “Looking at what we need, we need rain, almost of biblical proportions, without flooding out our brothers and sisters that live in the foothills or up in the mountains because of the burn scars [from previous fires].”

A storm system that moved into the region last Friday brought rain and some snow to the mountains in addition to the high winds that arrived this week and carried dust through the Valley.

The San Joaquin Valley Air Pollution Control District issued an advisory Monday night for hazardous levels of PM10 pollution. PM10 is made up of slightly larger particles than PM2.5, and usually comes from dust or pollen.

Dust can also increase the risk of valley fever. According to the Centers for Disease Control and Prevention, breathing microscopic fungal spores from dust can sicken people. The fungal lung infection is most common in the southwestern U.S.

‘You can’t just hold your breath’

There hasn’t been measurable rainfall in Fresno for many months as the state experiences extreme drought. Last week’s showers on Oct. 8 brought only .40 inches of rain to the Fresno area. The last time the area recorded considerable rain was April 25.

Pollution was a constant problem in the Valley, even before the wildfires started getting bigger and pushing smoke for longer periods of time, said Catherine Garoupa White, executive director of the Central Valley Air Quality Coalition and professor of geography at California State University, Stanislaus. The only difference is the “seasonality” of the pollution has been fading.

“What we’re having now, with accelerating climate impacts on an extension of the fire season, is that we’re having particle pollution year round at this point during ozone season,” Garoupa White said. “So it can be really hot, ozone pollution can be getting really high, and now we have [particulate matter] from fires.”

Ozone pollution is created when ground-level pollutants from sources such as cars, chemical plants or refineries mix with sunlight. While ozone pollution typically forms in hotter months, PM2.5 forms in colder months.

Local efforts to bring air monitoring to the community level is meant to better inform people about what they’re breathing and when, she added. She said air pollution isn’t distributed equally across the Valley, and if people are able to understand the air quality impacts in their own neighborhood, fewer may end up in the hospital.

A Stanford University study, released in August, looked at individual behaviors during periods of wildfire smoke and found that direct experiences and access to wildfire smoke information were helpful tools to form perceptions of the threat from smoke pollution. According to the study, “social norms and social support interact in complex, nonlinear ways to influence threat and efficacy perceptions, and directly affect protective health behavior.”

The weeks-long presence of pollution has led local organizations to distribute N95 masks for farmworkers. Air advocates have encouraged others to use air purifiers indoors, since pollution can also enter homes with poorly sealed windows and doors.

Still, Garoupa White said many face pollution impacts even after visible smoke has cleared. She said the warehouse industry and presence of large heavy trucks in parts of south Fresno pose an air quality danger for communities even after the skies turn blue again.

For this reason, Garoupa White said she worries air pollution can become normalized in communities despite the presence of dense smoke from wildfires growing each year. She said information needs to be distributed on a wider scale for people, not just on how unsafe pollution can be, but ways and resources to protect from it.

As director of CVAQ, "It's incredibly depressing to go tell people, 'Well, the air is unhealthy.' Because you can't just stop breathing, right?"

"You can't just hold your breath until the air gets safe," Garoupa White added.