

Prescribed fire gains momentum

In recent decades, California has made sparing use of fire as a land management tool. But policy changes, partnerships and attitude shifts are creating conditions for expanded use of prescribed fire.

A large, billowing plume of smoke and ash rises from a wildfire, casting a shadow over the landscape. In the foreground, a firefighter in a green vest stands in a field of tall, dry grass, monitoring the fire. The background shows rolling hills under a clear blue sky.

As Californians know too well, the 2018 wildfire season was historically severe. But for *prescribed* fire — fire set deliberately to achieve management objectives — 2018 was historically important.

California's fire management regime needed change — a strong conviction to that effect had developed in state government by 2018. The previous year's fire season had been unusually fierce, with the wine country fires rampaging in the north and the Thomas Fire, the state's largest-ever wildfire until that time, raging in the south. Leaders throughout state government recognized that climate change was exacerbating the state's perpetual wildfire problem — and would continue to do so. So it was that advocates for prescribed fire found the Legislature and former Gov. Jerry Brown broadly receptive to policy proposals that might mitigate the wildfire crisis. "Conversations were wide open," says Nick Goulette, former chair and current member of the steering committee at the Northern California Prescribed Fire Council. "Committees said 'Anything is on the table. What do we need to do?'"

In September 2018, the Humboldt County Prescribed Burn Association conducted a burn at the McBride Ranch near Cape Mendocino in Humboldt County, targeting about 350 acres of coyote brush that had invaded coastal rangelands.

Jeffery Stackhouse,
a Humboldt County
UCCE livestock and
natural resource
advisor, participates in
a restoration-focused
prescribed fire in
deciduous oak woodlands
on a ranch in eastern
Humboldt County.

They did a lot. It started in May, when Gov. Brown issued an executive order on forest health that, among its many provisions, instructed the California Department of Forestry and Fire Protection (Cal Fire), as well as the California Air Resources Board (CARB), to increase opportunities for projects in prescribed fire (Brown 2018). Then in September, the Legislature passed and the governor signed four pieces of legislation related to fire and forest health. One law, Senate Bill (SB) 901, provides Cal Fire \$1 billion over five years for forest health and fire prevention activities — including \$35 million a year for prescribed fire and other fuel reduction projects (the \$1 billion in funding is generated by California's greenhouse gas cap-and-trade program). The same law specifies that Cal Fire and UC Cooperative Extension (UCCE) will cooperate to deliver technical assistance on wildfire resilience to nonindustrial timberland owners. SB 1260 requires Cal Fire to cooperate on prescribed burns with public and private landowners. It also instructs Cal Fire to create a program for pre-certification of "burn bosses" — individuals who direct operations at prescribed fires — so that vetting of burn bosses needn't be conducted for each proposed burn. SB 1260 also, along with Assembly Bill 2091, aims to ease the way for prescribed burners to purchase private insurance.

In recent years, prescribed fire has played a very modest role in California's land management practices. It wasn't always so. Native American tribes conducted burns to manage resources long before Europeans arrived in the Americas. As recently as the 1980s, Cal Fire burned 30,000 to 65,000 acres a year (Quinn-Davidson 2018). In recent times, however, Cal Fire has burned fewer than 10,000 acres a year, and the acreage treated by all prescribed burners — Cal Fire, nongovernmental organizations, tribes, private landowners and so forth — has been inadequate to slow the ongoing buildup of fuels across California's forests and rangelands. Now, however, change is afoot — and the new laws and the executive order are only part of the story. To be sure, important policy changes now being implemented by Cal Fire are mandated by 2018 governmental directives, but changes at the agency also seem part of a cultural shift in attitudes toward prescribed fire. This cultural shift — which Lenya Quinn-Davidson, a Humboldt County UCCE fire advisor, has watched develop over her years as a prescribed fire practitioner — has itself been nurtured through partnerships established among stakeholders across the prescribed fire landscape. Today, prescribed fire seems on course to play a larger role in California's land management regime and — ideally



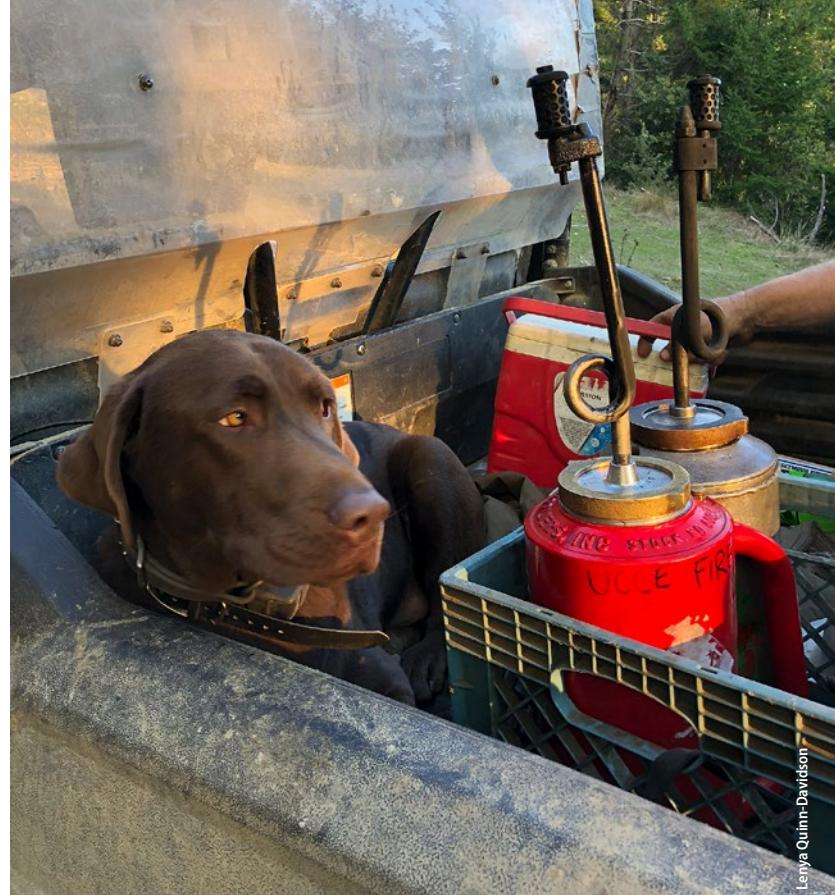
— to reduce the risk that wildfire seasons such as the last two become a permanent phenomenon.

Why to burn (and why not)

Prescribed fires can be conducted to achieve a variety of management objectives. For example, they can reduce fuel loads in forests so that high-intensity fires become less likely. Prescribed fire can establish diverse ecosystems in which threatened species thrive. In other contexts, they can help control invasive species. A recent study involving researchers from UC Irvine and UC Merced suggests that burning off water-hungry vegetation in the Sierra Nevada could increase California's water abundance (National Science Foundation 2018; Roche et al. 2018). Prescribed burns may also, by reducing the overall severity of wildfires, decrease the potential for erosion and sedimentation after fires. Over time, because low-intensity fires produce much less air pollution than do infernos feeding on dense accumulations of fuel, prescribed fire could even improve average air quality (Long et al. 2017; Schweizer et al. 2017).

Prescribed fire, then, can be a powerful tool for land management. But for a formidable set of reasons described by Quinn-Davidson and Goulette, California has made only modest use of prescribed fire in recent years. According to the state's Forest Carbon Plan — a May 2018 document developed by state agencies that partially underpinned Gov. Brown's executive order — only 17,500 acres of nonfederal land in California have undergone "forest restoration and fuels treatment" in the average recent year. Moreover, "forest restoration and fuels treatment" includes not just prescribed fire but mechanical thinning as well.

The greatest impediment to prescribed burning in California is the climate — the state's hot, dry summers and damp winters allow "burn windows" only during brief periods at the beginning and end of each fire season, and during intermittent periods over the rest of the year (Quinn-Davidson and Varner 2011). Even when conditions would seem to allow prescribed burning, permits are required from Cal Fire during fire season (typically, from May 1 through October 31) and from air quality management districts at all times. Cal Fire has often been skittish about issuing permits because, according to Goulette, "they worry about liability. What if they don't put out [an escaped] fire you started?" Permits from air quality management districts, meanwhile, can be challenging to obtain because of the state's persistent air pollution problem — and permits can be rescinded at the last hour if CARB declares a "no burn" day. (In 11 of the state's air basins, local air districts issue permits for specific burns but CARB decides whether burning is allowed at all. In the remaining four basins, local air districts have authority to declare their own "burn" and "no-burn" days.) The state also suffers from a shortage of people trained in conducting prescribed burns. The bottom line is that,



Leinya Quinn-Davidson

though California desperately needs to reduce fuel loads across its forests, the state has lagged far behind other areas — Quinn-Davidson points to the Southeast and the Great Plains — in its willingness to embrace prescribed fire.

But things are changing fast — especially at Cal Fire, an agency that sits at or near the center of any prescribed fire discussion in the state. All prescribed fires on nonfederal land in California require a Cal Fire permit during fire season. Advocates for any policy change related to fire, Goulette says, must negotiate with Cal Fire. That's why prescribed fire supporters are glad that — according to Craig Thomas, the recently retired conservation director at Sierra Forest Legacy — "Prescribed fire is back in the realm for Cal Fire. They are regaining their burning skills." By November of last year, Ken Pimlott — the since-retired chief of Cal Fire — was telling the national radio program "Science Friday" that "Putting prescribed fire back out on the landscape at a pace and scale to . . . actually make a difference is a high priority" (Science Friday 2018). Indeed, in accordance with SB 901, Cal Fire is now establishing 10 year-round crews dedicated solely to prescribed fire and fuels reduction.

Thomas is grateful for the new crews — but he'd like to see more of them. "We need a robust Cal Fire prescribed burn crew," he says, "in every county with significant vegetation." Goulette, meanwhile, argues that Cal Fire should institute what he calls an "objective permitting process" to make permit issuance more predictable. Hugh Scanlon — Cal Fire's former unit chief for Humboldt and Del Norte counties — finds Goulette's permitting suggestion generally reasonable. He cautions, however, that any statewide permitting

A dog protects drip torches in the back of a truck. With prescribed fire, land managers can achieve objectives that range from reducing fuel loads in forests to establishing diverse ecosystems in which threatened species can thrive.



Due to legislative action, an executive order and changes in attitudes toward controlled burning, prescribed fire seems set to play a larger role in California's land management practices.

process must be broad enough to account for the variable conditions — climatic conditions especially — that can exist across the state. Otherwise, a permit might be denied in one part of the state because conditions are wrong in a different part.

Burning together

The new laws, the executive order, the changes at crucial agencies — all of it seems bound up with the recent cultural shift that Quinn-Davidson discerns in California's attitude toward prescribed fire. The cultural shift in turn seems inseparable from partnerships established over recent years among key players in fire policy and practice. An example is the Northern California Prescribed Fire Council — the first organization of its kind in the West — which Quinn-Davidson cofounded in 2009 and directs today. A key element of the council's work, Quinn-Davidson says, has been building relationships among Northern California's large users of prescribed fire, including federal and state agencies, tribes, nongovernmental organizations and so on. A second key has been demonstrating to Cal Fire, among others, that prescribed fire enjoys widespread support in Northern California and in fact is already in use.

A more ground-level cooperative initiative is the Humboldt County Prescribed Burn Association, a group that Quinn-Davidson formed last year with Jeffery Stackhouse, a Humboldt County UCCE livestock and natural resource advisor. Prescribed burn associations are collectives of property owners who pitch in to burn one another's land. Burns conducted under this model produce all the land management benefits usually associated with prescribed fire and also provide burn training to nonprofessionals. In a state such as Nebraska, Quinn-Davidson reports, one encounters

nonprofessional but well-trained individuals who have participated in as many as 200 burns through prescribed burn associations. In California, such associations are new. But Quinn-Davidson and Stackhouse are working to expand them — with help from a grant program administered by UC ANR and originating with the federal Renewable Resources Extension Act. Funds from the grant program have helped Quinn-Davidson and Stackhouse further their objectives with the prescribed burn association in Humboldt County — and also perform outreach efforts in other counties, where they have conducted prescribed fire programs that include a daylong indoor workshop and a day of real, live burning. This June, again with the help of money distributed through the grant program, the pair will host a prescribed fire training session in Humboldt County for UCCE advisors and specialists.

Another node of cooperation is known as the Fire MOU Partnership. This initiative, according to its underlying memorandum of understanding, focuses on cooperation among entities "to increase the use of fire to meet ecological and other management objectives" (USDA 2015). The partnership includes a broad range of organizations, from Cal Fire to the U.S. Forest Service to the Nature Conservancy; since its 2015 inception, the partnership has grown from 12 to 36 members. Thomas was the primary drafter of the memorandum of understanding, though the Forest Service, Cal Fire and Scott Stephens — the widely known UC Berkeley forestry expert — also provided input. "What's exciting," Thomas says, "is that the air districts are joining. Previously, the fire managers and the air quality regulators weren't as collaboratively engaged."

Collaboration will need to flourish if California, so often ahead of national trends but lagging other regions in controlled burning, is to take full advantage of prescribed fire's benefits. "We always think we know best," Quinn-Davidson says of her state and its people — but "we're gaining some humility, which we need to do. We've got a lot to lose." **CA**

—Lucien Crowder

References

- Brown EG. 2018. Executive order B-52-18. State of California Executive Department. www.gov.ca.gov/wp-content/uploads/2018/05/5.10.18-Forest-EO.pdf
- Long JW, Tarnay LW, North MP. 2017. Aligning smoke management with ecological and public health goals. *J Forest* 116(1):76–86. <https://academic.oup.com/jof/article/116/1/76/4746805>
- National Science Foundation. 2018. Billions of gallons of water saved by thinning trees. News release 18-029. https://nsf.gov/news/news_summ.jsp?cntn_id=245128
- Quinn-Davidson L. 2018. Bringing fire back to California's private lands. UCCE Sonoma blog, UC Agriculture and Natural Resources Division. <https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=27800>
- Quinn-Davidson LN, Varner JM. 2011. Impediments to prescribed fire across agency, landscape and manager: an example from northern California. *Int J Wildland Fire* 21(3):210–8. www.publish.csiro.au/wf/WF11017
- Roche JW, Goulden ML, Bales RC. 2018. Estimating evapotranspiration change due to forest treatment and fire at the basin scale in the Sierra Nevada, California. *Ecohydrology* 11(7). <https://onlinelibrary.wiley.com/doi/full/10.1002/eco.1978>
- Schweizer D, Cisneros R, Traina S, et al. 2017. Using national ambient air quality standards for fine particulate matter to assess regional wildland fire smoke and air quality management. *J Environ Manage* 201:345–56. www.ncbi.nlm.nih.gov/pubmed/28692834
- Science Friday. 2018. Can California use more planned burns to prevent catastrophic wildfires? www.sciencefriday.com/segments/can-california-use-more-planned-burns-to-prevent-catastrophic-wildfires/
- [USDA] US Department of Agriculture, Forest Service. 2015. Memorandum of understanding for the purpose of increasing the use of fire to meet ecological and other management objectives. www.sierraforestlegacy.org/Resources/Community/PrescribedFire/Fire-MOUSigned.pdf