## CALIFORNIA FOREST STEWARDSHIP PROGRAM



FORESTLAND STEWARD IS A JOINT PROJECT OF CAL FIRE, PLACER COUNTY RESOURCE CONSERVATION DISTRICT, UC COOPERATIVE EXTENSION, AND USDA FOREST SERVICE TO PROVIDE INFORMATION ON THE STEWARDSHIP OF PRIVATE FORESTLANDS IN CALIFORNIA

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**EDITOR:** Cordi Craig NEW DESIGN, SAME GREAT CONTENT

The Future of Forestry

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In the mid-20<sup>th</sup> century, two 'one-hundred-year storms' caused devastating landslides in small Northern California logging towns, where entire hillsides sloughed off the surrounding clear-cut mountains. In response to the public outcry for forestry reform, California enacted the Professional Forester's Law and the Z'berg-Nejedly Forest Practices Act. Since 1973, these new laws set in motion a series of strict requirements for California's forest resource management, including the development of the Registered Professional Forester (RPF).

These laws were intended to serve the public interest and regulate forest management professionals to ensure a high level of expertise and knowledge in the treatment of forest resources throughout the state. As such, private landowners are legally required to have an RPF oversee and sign off on forestry-related project plans. Industrial timberland owners are no exception and any landowner pursuing forest management or working with cost share programs such as the CAL FIRE California Forest Improvement Program (CFIP) are required to work with a licensed forester.

# The Dilemma

Persistent drought, catastrophic wildfires, and climate change are impacting forests at an extraordinary pace and scale. In the last two years, more than 6.5 million acres burned in wildfires throughout California – an area roughly the size of Massachusetts. For forests to endure in a form that meets our expectations for resources and recreation, active and immediate management is required. State and Federal agencies are triaging the wounded landscape by utilizing licensed foresters for rehabilitation, leaving few RPFs available for private landowner consultation.



Although the changes to our forests over the last few years has exacerbated the RPF shortage, the challenge of finding a licensed forester in California isn't new. Numbers have been falling since the early 2000s, in part because many foresters have retired over the last two decades. "And our current situation is projected to get worse," stated Dan Stapleton, RPF #2707 and Assistant Executive Officer of Foresters Licensing for the Board of Forestry. "Nearly half of the registry has been licensed for at least 30 years and are likely to retire in the next 10 to 15 years."

Compounding this shortage is recruitment of students to a career in forestry. "Forestry isn't sexy," admitted Yana Valachovic, RPF #2740 and UC Cooperative Extension Forest Advisor in Humboldt County. As a member of the Professional Foresters Examining Committee (PFEC), she and others on the board are finding "more students opting to pursue degrees in climate science, ecology, or natural resource management."

# The Fallacy

This downward trend, however, may also be attributed to misguided perceptions of the field. Provocative photos documenting the Timber Wars in the 80s and 90s set in motion a long-standing rift between environmentalists and loggers. From the environmentalists' perspective, industrial timber operations are comparable to land piracy, pillaging the forest for the pursuit of capitalistic profit, with the forester sitting at the helm. But from the logger's perspective, forestry represents the cornerstone of the rural economy of the American West.

"Forestry often gets associated with unsustainable practices," Stapleton continued. "However, I think here in California, nothing could be further from the truth. California has high standards."

For example, for logging to occur in California, licensed foresters must develop a Timber Harvest Plan (THP) for each site, a process that can take 6 to 8 months, and sometimes up to 2 years. THPs are dense volumes, often upwards of 300 pages, that catalog biological, archaeological, and hydrological features of the site to verify that any potential negative effects to the environment have been considered and mitigated. A panel of representatives from agencies including CAL FIRE, the CA Department of Fish and Wildlife (CDFW), the CA State Water Resources Control Board (SWRCB), and the California Geological Survey (CGS) review and analyze each THP multiple times before any activities are permitted on the ground. Preharvest field inspections are conducted to examine the proposed logging site and a public comment period is required before any final recommendation from the review team. Still, work cannot begin on the harvest until the document is approved or denied by the CAL FIRE Director. After approval, RPFs are required to ensure that all management activities comply with these environmental safeguards. If violations are suspected, an RPF risks the revocation of their license.

# **Potential Solutions**

The field of forestry provides tools that incentivize proactive forest management, wood resources used for energy and infrastructure, and a foundation for rural economies. However, logging and forestry are not the panacea that will resolve all of California's forest health challenges. Solutions rarely come in one-size-fits-all. Having a thorough understanding of the land's history and a willingness to learn from mistakes, combined with a range of tools including education, research, and policy, California stands a chance at managing our forestland in ways that alleviate the pressures of climate change.

> "Nearly half of the registry has been licensed for at least 30 years and are projected to retire in the next 10–15 years."

– DAN STAPLETON RPF #2707 & Assistant Executive Officer of Foresters Licensing for the Board of Forestry

# Timber Harvest Plan (THP) Review Process

# Fieldwork

RPF conducts biological and cultural surveys, conducts a timber inventory, designates silvicultural prescriptions, maps plan areas, and designs road construction and maintenance.

# Sign & Submit

Once the RPF writes the THP, signatures are required from the landowner, RPF, and timber owner. Once signed, the THP is sent to the CAL FIRE regional review office, assigned a number, and the review begins.

# Pre-Harvest Inspection (PHI)

Review panel physically examines proposed plan area. A PHI report is submitted to the review team and includes first review questions. The PHI marks the start of the 30-day public comment period.

## Public Comment Period



Period Public comment period lasts 30 days after PHI. Within 15 days of the end of the public commen

of the end of the public comment period, the CAL FIRE director must make the final decision and approve the plan if it aligns with the Forest Practice Rules.

# Begin Harvest



Once a THP is approved, representatives from CAL FIRE or the review panel may inspect the harvest periodically. A THP is valid for 5 to 7 years.

# Notification

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Letters of Intent are sent to notify local tribal representatives and landowners within 300 ft of the proposed harvest. Landowners within 1,000 ft downstream of a proposed harvest are also notified.

# Confidential Archeology Review

RPF requests survey records from the CA Office of Historic Preservation, conducts field surveys, and writes archeology report that is reviewed by a CAL FIRE archeologist. Findings are not disclosed to the public to protect sensitive information.



## Agency Review

CAL FIRE distributes the THP to a Review Panel comprised of CDFW, CGS, and the CA Regional Water Quality Control Board.



## RPF Response

The panel submits questions, clarifications, and comments. Panel may request as many review periods as necessary, but RPFs generally work through two or three reviews.



Logging requires the use of a certified License Timber Operator (LTO) whose signature is required for a complete THP. There can be more than one LTO per THP.

The THP process ensures that logging operations are compliant with all environmental laws and regulations. Any violations are promptly addressed and may result in civil penalties, fines, criminal proceedings, or the revocation of an RPF or LTO license.



# Homeowner's Basics

The following tools are helpful for basic fuels reduction and forest health improvement projects for landowners. Large machinery can be expensive, so rentals are a great option. Cost estimates are for new equipment and rental prices but may not include necessary tool accessories such as ropes, tow straps, blades, or fuel. *Listed prices are estimates and actual cost may vary based on location, size, brand, and availability.* 

NAME	USE	PRICE ESTIMATES (BUY/RENT)	рното
12" Tow Behind Chipper	Process unwanted vegetation or small trees that pose risks as ladder fuels for wildfire.	<u>Buy:</u> \$20 - \$25,000 <u>Rent:</u> \$150 - \$265 / day	
Masticator / Brush Mulcher	Grind and mulch understory vegetation and small trees to reduce ladder fuels.	Attachment only <u>Buy:</u> \$6,000 - \$9,500 <u>Rent:</u> \$200 - \$250 / day	
Walk Behind Tracked Mini Skid Steer (with grapple attachment)	Move large logs or piles of vegetation.	Attachment only <u>Buy:</u> \$2,000 - \$3,000 <u>Rent:</u> \$250 - \$350 / day	
Stump Grinder	Grind the stumps to prevent resprouting species, such as oak or toyon, from returning.	<u>Buy:</u> \$1,600 - \$4,500 <u>Rent:</u> \$115 - \$300 / day	
Honda Winch	Clear that steep, stubborn corner of your property without vehicle access. Drag large piles of vegetation up or downhill for processing.	<u>Buy:</u> \$1,200 - \$1,500 <u>Rent:</u> N/A	
Portable Sawmill	Put your felled trees to work. A portable mill uses a chainsaw bar on tracks to guide cuts along the top of the log.	<u>Buy:</u> \$200 - \$700 <u>Rent:</u> N/A	



The UC Cooperative Extension has great information on the cost effectiveness of various forest fuels reduction techniques. See table below, taken from **UCCE's Fire in California webpage.** 

# CAL FIRE

CAL FIRE recently **announced** that several million dollars will be allocated for the California Forest Improvement Program (CFIP) over the next 3 years. Private forest landowners in California who own between 20 and 5,000 acres may be eligible for up to 90% cost share assistance to improve forest health and fire resilience. CFIP has been incentivizing investments in California's forest resources since 1978 and has encumbered more than \$75 million for landowner assistance since its inception. Find out if you're eligible for the program by visiting CAL FIRE's **website** and speaking to your local Forestry Assistance Specialist.

	COST/ ACRE	TREATMENT Effectiveness	REMOVE Woody Plants	REMOVE Small Shrubs	REMOVE GRASS	SUPPRESS New Plants
Mechanized	\$\$	5 - 7 years	Х	Х		
Herbicide	\$ - \$\$	5 - 7 years			Х	Х
Grazing	\$\$ - \$\$\$	1 - 3 years		Х	Х	Х
Prescribed Fire	\$\$ - \$\$\$	1 - 7 years		Х	Х	Х
Manual (Handwork)	\$\$\$	1 - 2 years	Х	Х		

# Becoming

Finding a balance between fiscal and biological sustainability is never simple but navigating forest management amidst escalating challenges requires investment in capacity building, and more specifically, the promotion of forestry as a career among young and innovative minds. Becoming a licensed forester in California requires 7 years of forestry experience or 7 years of combined forestry experience with an applicable degree, and passing a comprehensive examination.

If you or somebody you know is interested in a career in forestry, explore the **California Licensed Foresters Association (CLFA)** website to find out more about the application process and mentorship resources.

# Forest Health

# Guest Author: Michael I. Jones, PhD

Michael Jones is an expert on forest pests and pathogens. After earning his bachelor's degree studying sudden oak death, he worked as a research associate in the UC Davis Department of Entomology and participated in collaborative research projects with the US Forest Service involving native and invasive forest pests. Before joining the UC Cooperative Extension in 2018, he earned a PhD in Entomology from the State University of New York, College of Environmental Science and Forestry (SUNY ESF) for his work on the invasive emerald ash borer. Currently, as a Forest Advisor with UCCE, Jones is devoted to helping landowners sustain healthy forests that are resilient to insects, diseases, fire, and climate change.

As somebody who has studied forest health for a while, I have developed the rather unfortunate habit of noticing only the red and brown canopies that appear in a sea of green (my wife says it makes visiting the forest with me rather depressing). Unfortunately, over the past few years, the tell-tale sign that a tree just died has become a common sight in California forests. While there is a suite of forest health issues (invasive species, fire suppression, and climate change to name a few) that are contributing to this dieback, there is one that I am most concerned about: Drought.

Many California native tree species are well-adapted to drought and have an incredible ability to survive through hot and dry seasons. But the continued and severe drought conditions are worsening already widespread forest health issues, resulting in new insect and disease outbreaks. This includes the common maladies like sudden oak death and mountain pine beetle. But more recently, tree species and forest stands that have been relatively unimpacted, such as oak woodlands, are showing signs of stress. While tree mortality is an inevitable and important part of dynamic and healthy forests, the rate and scale of mortality has become concerning.



# **Ponderosa Pine**

I first noticed that drought stress was becoming an issue in early spring, when ponderosa pine began to die in eastern Mendocino County. Upon investigation, I found extensive western pine beetle and red turpentine beetle activity. Conifers in coastal forests largely escaped the bark beetle outbreaks experienced in the Sierra, so the recent mortality in these stands was a surprise. I suspect the insects had established in fire stressed trees and their populations had built up over the years. Now they can spread to trees with little to no fire damage and even those that had not seen fire for decades. Ponderosa pine mortality is now reported



from northern Mendocino to northern Napa, suggesting we are at the early stages of a western pine beetle outbreak. We may see a significant increase in pine mortality into the next year, especially if drought conditions persist.

# Douglas-fir

Over the past few years, there has also been noticeable Douglas-fir decline, especially in young trees that have encroached into oak woodlands and rangeland. In some areas of the Sierra, Incense cedar or other conifers are filling a similar role in other forests. This is an indication of unhealthy forest conditions and stressed trees, but not necessarily a serious forest health issue caused by insects or disease. The encroachment of these trees into other habitats is the result of forest succession in the absence of fire. In my opinion, the decline of some trees is an important natural process resulting from growing in low quality sites, at high densities, and competing for water and nutrients. Drought further increases water stress, facilitates insect and disease infestations, and accelerates the rate of failure. However, I have yet to see extensive Douglas-fir mortality in high quality sites such as north facing slopes with moist, mild climates.

# Oak Woodlands

Interior live oak and California Black oak mortality in southern Mendocino County is another indicator of severe drought stress. Upon investigating several clusters of declining trees, dieback was not associated with sudden oak death, but instead appeared to be caused by outbreaks of western oak bark beetle, a native beetle that is attracted to stressed trees. Many of the declining trees had evidence of bark beetle activity, however several trees with only a few galleries were covered in cankers. Foamy bark canker, a disease caused by a pathogen the bark beetle vectors, exploits trees that can't fight back due to stressful conditions. I have only observed this decline in a few areas, though western oak bark beetle is found throughout California and could easily spread to other areas where oaks are experiencing severe drought stress.

# What Can We Do About Forest Health and the Drought?

Many of the pests I mentioned are native. They are simply acting as natural disturbances to help cull stressed trees and begin the process of nutrient cycling. While eradicating these pests or preventing them from infesting trees is extremely difficult, pruning or removing and destroying heavily infested material may help control their populations. Suppressing insect and disease populations will not prevent all tree mortality but may reduce outbreaks that spread to healthy trees.











Thinning is another way to improve forest resiliency. It can promote tree vigor through the reduction of competition and enable greater access to water and nutrients. Removing understory competition or thinning the dominant canopy to increase spacing between trees may facilitate establishment of the next cohort. However, in oak woodlands or savannahs, where thinning doesn't play a significant role in stand management, hopefully the evolved drought adaptations will be enough to help them survive.

Practicing and implementing sustainable management practices can improve forest health. Consult with a local forester to further explore forest management strategies. For more information check out the **UCCE Mendocino - Forest Health** webpage or contact me (or your local UC Extension Forest Advisor) with any questions.

# Can Wildfire Smoke CONTAMINATE BACKYARD GARDENS?

The shift of California wildfires from rural to urban environments in the last few years has sparked concern over how smoke contaminants may affect backyard gardens and chicken eggs. According to research conducted by the University of California Cooperative Extension (UCCE), however, smoke contamination of backyard gardens does not appear to be significant. The study, which began in the fall of 2017, followed the string of fires that ravaged the North Bay, including the devastating Tubbs fire.

"It was the first of a series of urban wildfires, where the ash had contaminants beyond those of wood smoke," recalled Julia Van Soelen Kim, MS, MPH, North Bay Food Systems Advisor for the Napa County UC Cooperative Extension.

# What's in Wildfire Smoke?

When structures, vehicles, and electronics burn, the smoke can carry lethal chemicals. Chemicals from wildfire smoke most directly enter the body through inhalation, however there are chemicals in the soil and water that can also be ingested or absorbed through the skin once they enter plant tissues. Once in the blood, these chemicals can move to other organs and cause significant health problems. The primary contaminants of concern are heavy metals, polycyclic aromatic hydrocarbons (PAHs), and consistent organic pollutants such as dioxins, furans, and polychlorinated biphenyls (PCBs).

# **Research Methods**

To test for contaminants, the research team collected plant tissue and soil from around affected areas and used the state's Proposition 65 "no significant risk level" (NSRL) as a baseline for unsafe consumption. NSRL is a highly conservative risk threshold and is defined as "a daily intake threshold that would cause fewer than 1 in 100,000 people in the exposed population to get sick."



# **Relieving Results**

The results were encouraging. No produce samples had detectable levels of lead, arsenic, mercury, or chromium and no samples with PAHs or PCBs. Of the 13 samples, 1 sample contained nickel at levels that exceeded the Prop 65 NSRL. However, several different forms of nickel exist, and the detection may have been completely benign. Smoke contaminants in soil were also a low concern. None of the soil samples had any PCBs, but the site closest to the Santa Rosa fires had levels of dioxins and furans that exceeded soil screening levels.

"Of the multitude of things to worry about following a wildfire, produce safety does not appear to be a top concern," Van Soelen Kim continued. In fact, the cancer risk reduction from eating vegetables far outweighs the risks associated with smoke contamination.

The results suggest that there is little reason for concern, although experts encourage community members to consider how the land was used in the past and test their soils. "It is general best practice when starting a garden to look into the site history," Van Soelen Kim stated. You can find affordable at-home soil testing kits for general indicators of soil health such as percent organic matter, nutrients, soil pH, and heavy metals. If you start to see red flags, then explore additional resources.

# How About Chicken Eggs?

Since chickens spend most of their days pecking at the soil for insects and grubs, the researchers also analyzed whether smoke negatively affected the toxicity levels in chicken eggs. Ingested toxins from the soil may present themselves in the eggs that we cook and consume. Based on samples from nearly 350 sites throughout California, lead was found in chicken eggs at several isolated sites. The high lead levels were attributed to contaminated water from old pipes or lead paint from older homes but were not associated with areas impacted by wildfire smoke. The results indicate that people raising chickens should test their sites for potential lead contamination, but smoke exposure does not seem to be a primary contributing factor.





"The results were encouraging, but preliminary," Van Soelen Kim concluded. "As urban wildfires are likely to increase, this is a topic that will only become more relevant."



If you're interested in testing your soils, reach out to your local Master Gardeners chapter or UC Extension Office

# Health is Complex

There remains a lot to learn of the effects of urban wildfire smoke on food safety, but at the end of the day, the researchers emphasize perspective and personal risk. Children, pregnant women, elderly people, and those with preexisting conditions are at an increased risk of adverse effects from wildfire smoke. Generally, the best defense is to follow basic health and hygiene practices including 1) wearing an N95 mask when outside gardening in smoky conditions, 2) washing your hands before and after harvesting, and 3) washing your produce before consumption.

Factors that determine an individual's health are complex and layered. However, there is evidence that building local food systems and a strong local economy can contribute to good nutrition and social support, all protective factors that enhance regional health and resilience.

# Learn More About the Research Design and Findings

## **CLICK HERE**

## **CAL FIRE**

John Ramaley, Deputy Chief of Forestry Assistance; john.ramalay@fire.ca.gov

### CAL FIRE Forestry Assistance Specialists (FAS)

### Find the FAS for your county.

*Guy Anderson* (Fresno, Imperial, Inyo, Kern, Kings,Los Angeles, Merced, Mono, Monterey, Orange, Riverside, San Benito, San Bernardino, San Diego, San Francisco, San Joaquin (East), San Luis Obispo, San Mateo, Santa Barbara, Santa Cruz, Stanislaus (East), Tulare, Ventura); 559-243-4109

**Topher Byrd** (Alameda, Contra Costa, San Joaquin(West), Santa Clara, Stanislaus (West)); 408-499-4255

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Dawn Pederson (Colusa); 530-528-5199

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## California Association of Resource Conservation Districts (RCDs)

916-457-7904; staff@carcd.org

### **Natural Resources Conservation Service (NRCS)**

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## **Events Calendar:**



## California Wildfire and Forest Resilience Task Force

RESILIENCE Task Force has developed a comprehensive

implementation strategy to track goals, actions, and achievements identified in the California Wildfire and Forest Resilience Action Plan.

### Upcoming Meetings:

March 24, 2022; Virtual, 1 pm - 3:30 pm May 5, 2022; Sonoma, TBD July 21,2022; Sacramento, 1 pm - 3:30 pm September 15, 2022; Sierra, TBD November 17, 2022; Sacramento, 1 pm - 3:30 pm

## California Forest Vegetation Management Conference

Discuss improvements in forest health management and exchange information on management techniques, methodology, and research with local, state, and federal agencies.

June 1 - 2, 2022 REGISTER HERE

# California Forest Stewardship Workshops

## **Placer and Nevada Counties**

Online beginning March 15 - May 10, 2022 and in-person Saturday, April 2, 2022

Join the workshops to understand and protect your forests by developing a Forest Management Plan. Registration for the workshops is \$60. Sign up online. For questions, contact Kim Ingram, **kcingram@ucanr.edu**.

## Forest Landowners of California (FLC)

FLC is hosting "The Challenges Facing our Private Forestlands," a technical session on forest stewardship and lessons learned from recent wildfires. In-person, May 6 - May 7, 2022

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