

Licensing News

Office of Professional Foresters Registration



Summer 2019

Volume 31 - Issue 1

CURRENT PROFESSIONAL FORESTERS EXAMINING COMMITTEE COMPOSITION

Professional Foresters Registration shall protect the public interest through the regulation of those individuals who are licensed to practice the profession of forestry, and whose activities have an impact upon the ecology of forested landscapes and the quality of the forest environment, within the State of California.

Mr. Otto van Emmerik, Chair – RPF (Industry, Retired)
Mr. Dan Sendek – RPF (Public)
Mr. William Snyder – RPF (Cal Fire, Retired)
Mr. Gerald Jensen – RPF (USFS, Retired)
Mr. Jason Poburko – RPF (Cal Fire)
Mr. Larry Forero – CRM (Certified Specialty)
Mr. James Hawkins - RPF (Industry)
Mr. Frank Mulhair – RPF (Industry)
VACANT – (Public Member)
VACANT – (Consulting Member)

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CURRENT BOARD OF FORESTRY & FIRE PROTECTION COMPOSITION

The Board's mission is to lead California in developing policies and programs that serve the public interest in environmentally, economically, and socially sustainable management of forest and rangelands, and a fire protection system that protects and serves the people of the state.

Dr. J. Keith Gillless, Chair (Public Representative)
Ms. Darcy Wheelles (Public Representative)
Mr. Richard Wade (Timber Industry Representative)
Ms. Susan Husari (Public Representative)
Mr. Marc Los Huertos (Public Representative)
Mr. Mike Jani (Timber Industry Representative)
Ms. Katie Delbar (Range/Livestock Representative)
Mr. Christopher Chase (Timber Industry Representative)
One Public Representative position remains unfilled

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The View from the 15th Floor *by Dan Stapleton, Asst. Executive Officer*

Once again, it was a record year for California wildfires in 2018. With the addition of the Camp Fire, four of the top twenty largest wildfires ever recorded and six of the top twenty most deadly fires in California history have all occurred within the last two years. This has moved the California Legislature to chapter legislation in 2018 to include:

- SB 901 Wildfires
- SB 1260 Fire Prevention & Protection: Prescribed Burns
- AB 2911 Fire Safety
- AB 2518 Innovative Forests & Mass Timber

With powerline maintenance and clearance contributing to many of these fire starts, Pacific Gas and Electric has filed for bankruptcy and Californians are searching for solutions. The Board toured the town of Paradise in May this year and it was disturbing to see how the fire impacted so many in so little time, claiming 89 lives and destroying 18,000 structures. As in the management of forests, it was evident that creating fire safe communities requires all the possible tools in the toolbox, from forest thinning to revised building codes, emergency planning to support for community fire safe councils

through a more streamlined permitting process.

It was an emotional presentation, with our host, CAL FIRE Unit Chief David Hawks, pausing momentarily before revealing that he grew up in Paradise and that both he and his parents lost their homes in this wildfire. The tour wound its way through the town where the destruction was evident everywhere. Site restoration was ongoing and there were trucks and excavators on every block. It was not uncommon to find houses that appeared to be perfectly intact and untouched surrounded by others that were completely lost. There was no obvious reason one was spared over the other, but many on the tour surmised a change in wind direction and a random fire brand entering an attic soffit vent, or a roof gutter that was not recently cleaned, that may have led to the destruction.



The local Fire Safe Council efforts did help reduce the fire mortality to trees in areas that were treated and helped to protect some structures. However, the 25 to 50 mile an hour gusts and dry conditions easily allowed fire brands to start spot fires beyond those treated areas. Near Paradise Lake, an SPI shaded fuel break retaining 50 square feet of basal area and located on the periphery of the fire successfully kept the fire's spread in check. But many experienced fire fighters didn't think even shaded fuel breaks of similar size containing such aggressive vegetative treatment would be able to withstand a direct push from the head of this fire. In this case, it functioned as intended and kept the fire on the forest floor resulting in the survival of the majority of the overstory while protecting several structures and the beneficial uses of nearby Paradise lake.

The trip ended with a viewpoint over Butte Creek canyon, north of Paradise. This canyon, which burned in the fire, is deep and wide and full of resurging grasses and sprouts. Fuel for a future fire that could easily run up slope through the steep terrain channeled by local wind patterns. Although this area would appear to have the highest risk and potential for destructive wildfire, several newer homes remain largely untouched, possibly due to more contemporary building standards.

The lessons learned from this fire will be used to formulate protection measures for communities and wild lands in the coming decades as we contemplate a warming environment and an expanding populace in our state's fire evolved landscape.

Mark Andre retires from the Board of Forestry

In other news, the composition of Board membership changed slightly in 2018 as Public Representative and RPF Mr. Mark Andre retired from his position on the Board after nine years of service. Mark continues in his role as the Director of Environmental Services with the City of Arcata. His experience and guidance on Board issues as both

member and Vice-Chair will be hard to replace. We wish Mark all the best and thank him for his dedicated service to the Board and California forestry.



Mark Andre, presented with a resolution from the State Legislature for his service and dedication to the Board of Forestry and Fire Protection. Pictured left to right: Board Executive Officer Matt Dias, Board members Marc Los Huertos, Susan Husari, Katie Delbar, CAL FIRE Director Thom Porter, Board members Mike Jani, Rich Wade, and Darci Wheelles.

Russ Henly Retires from the Resources Agency

In January, Assistant Secretary of Forest Resource Management Mr. Russ Henly, retired after 26 years in state service. Russ is an RPF with a BS in Forest Science and an MS in in Forest Policy and Economics from the University of Minnesota. He received his PhD in Wildland Resource Science from the University of California Berkeley. Russ has been instrumental in the development of the Effectiveness Monitoring Committee (EMC), an advisory committee to the Board charged with assessing the efficacy of the Forest Practice Rules and other related laws and regulations. Russ worked closely with all stakeholders to ensure the most comprehensive analysis of potential impacts from forest management activities. Russ received a Distinguished Service Award from the Board of Forestry in January 2019 in recognition of his contributions to California Forestry. The staff here at the Board wishes Russ well in his retirement.



Russ Henly (left) receives a Distinguished Service Award from Board Chair Keith Gilles.

PFEC Notes



In May, RPF and Professional Foresters Examining Committee (PFEC) Vice-Chair **Dr. Kimberly Rodrigues** stepped down from her Public Member position. Kim spent 14 years on the committee and brought balance and insight to issues related to licensing and regulation. Her breadth of knowledge and her perspective as the only female member of the PFEC added a needed element to committee discussions as the numbers of female forestry students and exam applicants continue to grow. In the June 2019 PFEC meeting, committee Chair Otto van Emmerik accepted a Distinguished Service Award from the Board for Kim, recognizing her dedicated service to foresters licensing. We wish Kim all the best in her retirement.

In January of this year, the Board re-appointed **Jason Poburko** (RPF, Cal Fire) to the PFEC. Jason has been instrumental in reviewing exam study materials to ensure they are up to date and is willing to think outside of the box when contemplating contemporary issues facing Registered Professional Foresters.

May 31 was the last day for **Shuhani Patel** as Assistant to the Executive Officer Foresters Licensing. Shuhani began working for CAL FIRE late in 2012 as an Office



Technician (OT) and was later promoted to a Staff Services Analyst (SSA), managing renewals, withdrawals, revocations and all things related to the Foresters Licensing Program. In December 2018, Shuhani graduated from Eastern Oregon University with a Master of Business Administration (MBA) degree. In 2019 Shuhani accepted a limited term position with the Office of the State Fire Marshal then accepted a permanent assignment in CAL FIRE's EMS Program. We wish her well in her

new career path.



Brandi Goss joined the Board Staff late in 2018. Originally from Pennsylvania and later Florida, Brandi attended college at Florida State University and graduated Summa Cum Laude with a Bachelor of Science in Biological Sciences and minors in Chemistry and Environmental Science. Brandi admits "I needed a change of scenery and didn't want to work with quite so many venomous snakes (yikes!) in Florida, so I moved to Yreka, California for my first real job after graduation as a fisheries technician. I have immersed myself in forestry for the last 6 months or so with the

Board of Forestry and Fire Protection and I am so excited to keep working on the varied and many projects before me with the Board". We are all very glad to have Brandi's help here at the Board.

David Ludwig joined the Board staff in the spring of 2019 as a Forestry Assistant II working under Forester III Eric Hedge. David was born in Buffalo, NY and grew up in a nearby suburb. He studied Environmental Policy and Governance at Cornell University and moved to Davis, California upon his graduation. "Forestry and wildfire policy were among my areas of study. My experience includes NEPA compliance for federal agencies, integrated pest management for agriculture and forests, extension, and work with the Office of the New York State Attorney General's Environmental Protection Bureau". Additionally, David has four years of experience volunteering as an Emergency Medical Technician. He has interests in naturalist outreach, raptor husbandry, birding, hiking, and music. "I look forward to working with the Board and learning as much as I can about my new environment". Welcome to the Board David!



Snapshot in History



Executive Committee, Association of State Foresters Meeting, Madison, Wisconsin, September 1962. Left to Right: Ray Shirley (Georgia), Ralph Wible (Pennsylvania), John Beale (Wisconsin), Francis Raymond (California), Tom Borden (Colorado).

Thomas Porter Appointed Director of CAL FIRE

Chief Thom Porter was appointed Director by Governor Gavin Newsom on January 8, 2019 after being designated as Acting Director of the California Department of Forestry and Fire Protection by Governor Edmund G. Brown Jr. on December 14, 2018. He had been serving as Chief of Strategic Planning in CAL FIRE Sacramento Headquarters since January 1, 2018. Previously, he served as the Southern Region Chief, Assistant Region Chief, and San Diego Unit Fire Chief. Chief Porter also held positions as the Southern Region Forester, Unit Forester and Prevention Division Chief, and Forestry Assistance Specialist.



Chief Porter is a Registered Professional Forester (RPF No. 2567) with a Bachelor of Forestry Degree from the University of California Berkeley. He has worked in private industry as a forester for Menasha Corporation in Grass Valley, California, and as a field forester with Weyerhaeuser Company in Cosmopolis, Washington. I asked the Chief about his experience and background in forestry and what he thought about the future of forestry in California.

"I have always enjoyed the woods. Growing up in the mountains of Southern California gave me the opportunity to spend countless hours in the woods with friends and alone. I developed a deep respect for the natural landscape and the need to manage it in a responsible way. I am influenced by my conversations with Native Americans who I grew up with and the fact that wildfire is a permanent and enduring part of California's story. Further, I have deep roots in forestry, my great grandfather was a student of Carl Alwin Schenck. Herbert K. Porter left his medical practice to join the first class of foresters trained at the Cradle of Forestry in North Carolina. He has been a great source of inspiration to me in my career as a public servant in this field. I believe that foresters have a unique point of view and training that is necessary in the management and preservation of the natural things that make California one of the most diverse and important landscapes in the world. Forestry and fire protection and prevention are inextricable and CAL FIRE is in a position to continue leading the world in this space."

I agree with the Chief's assessment that RPFs by training and experience have a unique perspective, one that will be important going forward in managing and protecting the diverse natural resources and infrastructure here in California.

Registered Professional Foresters & Certified Rangeland Managers

RPF and CRM Rolls

The table below indicates the known status of all current and former registrants by license type as of June 21, 2019.

STATUS	RPF's	CRM's
Valid	1,138	87
Withdrawn	178	7
Revoked (non-payment or disciplinary action)	758	11
Voluntarily Relinquished	679	10
Suspended	0	0
Deceased	319	6
TOTAL	3,065	121

REGULATIONS EFFECTIVE JANUARY 1, 2018

In 2018, the Board approved the first re-adoption of emergency regulation to assist in post fire salvage in the counties of Napa, Sonoma and Mendocino and approved additional emergency regulation to assist in post fire salvage in the Counties of Lake, Siskiyou, Mendocino, Shasta, Trinity and Napa in 2018. A full list of 2018 approved regulation can be viewed at the [Board website](#).

REGULATION FILES (new addition to Board's website)

All regulation files are now available at the Board website [here](#).

RPF and CRM Examination Announcements

The Winter 2019 examination has been scheduled for October 4th, 2019 and the deadline for NEW applications will be August 9th, 2019. The Spring 2020 Examination has been scheduled for April 3rd, 2020 and the deadline for NEW applications for that exam is February 7th, 2020. The [examination notices](#) can be located online on the Professional Forester Registration webpage.

NOTICE: Due to funding restrictions, the RPF examination in October 2019 is planned to be conducted in Sacramento only. However, ongoing discussions with CLFA are examining the possibility of having additional exam locations in Eureka and Redding. If there are any changes in the exam location, a revised Exam Notice will be posted at the following link prior to the exam application deadline:

<https://bof.fire.ca.gov/projects-and-programs/professional-foresters-registration/rpfcrm-examinations/>

Those interested in taking the RPF or CRM examinations are encouraged to contact Dan Stapleton with any questions about qualifications prior to submitting an application and exam fee. Dan may be reached at 916-653-6634 or by email at dan.stapleton@bof.ca.gov.

Welcome to New Registrants

The following individuals passed the RPF or CRM Exams held in October 2018 and April 2019 and were approved for registration by the Board of Forestry and Fire Protection. Congratulations and welcome!

October 5, 2018 Exam

Madeline Green - RPF No. 3069
Joseph King Jr. - RPF No. 3071
James 'Christian' Eggleton - RPF No. 3073
Jerrold Sharp - RPF No. 3075
Jonathan Szecsei – RPF No. 3077

Jacob Harrower - RPF No. 3070
Ivy Kostick - RPF No. 3072
Robin Bellows - RPF No. 3074
Timothy Montgomery - RPF No. 3076
Allison Rofe - CRM No. 121

April 5, 2019 Exam

Anthony Melia – RPF No. 3078
Cory Drenon – RPF No. 3080
Lindsey Holm – RPF No. 3082
Timothy Moreno – RPF No. 3084
Brady Dubois – RPF No. 3086
Jonathan Fitch – RPF No. 3088

Meghan Breniman – RPF No. 3079
Allison Erny – RPF No. 3081
Aaron Sawyer – RPF No. 3083
Jeremiah Steuterman – RPF No. 3085
Kyle Mills – RPF No. 3087
Kristina Wolf – CRM No. 122

In Memoriam

This section is devoted to the memory of those fine foresters who have passed from our ranks. Regrettably, I am sometimes late in getting this information posted. So that I may provide timely remembrances, if you have knowledge of an RPF or CRM passing, please forward this information to my Board email address at dan.stapleton@bof.ca.gov so that I can pay tribute to these individuals at the next Board of Forestry meeting and in the next edition of Licensing News.

James B. Nile, RPF 11

Jim was born in Nevada City, California in 1926 and graduated from Grass Valley High School in 1944. Following high school, he enlisted in the US Navy and served on the USS Shipley Bay during World War II. Following his service Jim attended UC Berkeley where he obtained his forestry degree in 1952, the year he joined SAF. He worked for Southern Pacific Land Company and Santa Fe Pacific from 1953 to 1986. Following retirement, Jim became a tree farmer and small timberland owner in Siskiyou County, California. He will be remembered for his sense of humor, and his support for foresters and the profession. He was California Registered Professional Forester #11 and SAF Member #2024.

Robert J. Malain, RPF 40



Born on April 30, 1927. Bob transferred to UC Berkeley in 1948 to further pursue a career in Forestry. After enlisting in the U.S. Navy in April of 1945, Bob earned a Bachelor of Science degree in Forestry at UC Berkeley. Bob was hired by the U.S. Forest Service and later by the California Department of Forestry. He worked in various positions, rising through the ranks, in Mariposa County and Fort Bragg before moving to Redding. He retired in 1991 from a career he dearly loved with exactly 40 years' service in CDF. Bob passed away peacefully at his home on January 17, 2018.

Harry Collin Abraham, RPF 203



Hank Passed away April 5, 2019 at the age of 98. He received his degree in Forestry from Cal Berkeley in 1942. Hank loved the high Sierra and spent much of his youth there skiing, hiking and participating in the Boy Scouts. Hank was active in SAF and in the California Alumni Association. He retired as Chief Forester for American Forest Products after 25 years in the South Sierra Division. Hank participated in Cal Forestry's "Voices from Camp" centennial video production detailing his experience as a young forester felling a seven-foot diameter sugar pine with unintended consequences. The video can be seen [here](#).

Paul Kirkenadall, RPF 163



Paul Kirkendall passed away peacefully on February 22, 2019, after a long and joyous life. He was born in Cebu, Philippine Islands, and later moved to San Diego. He attended University of California at Berkeley, majoring in forestry. He then served in the military for 3 years, mainly stationed in Germany. While there, he took trips to many other countries on selected weekends. During his time in the army, he learned to fly army aircraft as a hobby. He then worked 45 years for an aerial photography company in Oakland.

Michael S. Howell, RPF 2030



Michael Howell died November 2, 2018 at the age of 67 from pancreatic cancer. He was born on July 14, 1951 in Berkeley, CA. Mike is a graduate of Napa High School and Humboldt State University at Arcata, CA. Mike worked for Shuster Logging right out of college then a number of years as forester at Masonite in Ukiah. Mike Howell Consulting Forester, located in Boonville, has been the name of his own business for over thirty years, servicing clients in Mendocino, Sonoma and Humboldt County. He enjoyed rehabbing his old vineyard, developing additional vineyards, making wine, drinking wine and wine

sales. Mike was a long-time member of the California Licensed Forester Association (CLFA), a board member of the Mendocino County Planning Commission and Airport Commission and the Farm Bureau.

Harry. W. Camp Jr., RPF 342

Harry Camp passed away quietly in his home April 22, 2019, at 108 years old. He was born September 20, 1910 at Ft. Totten, N.D. but grew up in the State of Washington. He



graduated from the University of California, Berkeley in 1933 with a degree in forestry, and spent the next 42 years working with the U.S. Forest Service. He received numerous awards including the highly prized John Beale Award for service to the Society of American Foresters. Harry retired in 1974 as Regional Director of the Pacific Southwest Forest and Range Experiment Station, with headquarters in Berkeley, California. Harry and Neva

Gerdes (preceeded in death) were married for 48 years. He is survived by his son, Gordon Camp of Elk Grove, CA and daughter, Wendy Camp of Napa, CA. He has five grandchildren and three great grandchildren. Harry married Myrna Anderson in June, 1983. They lived in California for 26 years before moving to North Oaks, MN in 2009. When Harry passed he was the oldest man in Minnesota and the 14th oldest man in American. He was also known as a runner up at an infamous cribbage competition against a younger, 105 year-old challenger as detailed in this [news article](#). Way to go Harry and thank you for your contributions to California forestry.

David Arthur Bischel, RPF 1746

David Passed away April 25, 2019 at the age of 68 in Auburn, California. David had an exemplary 44-year career dedicated to forest management and sustainability. He was



the forestry manager for Southern Pacific Land Company's 220,000-acre Mt. Shasta District and served 22 years as the President and Chief Executive Officer of the California Forestry Association (CalForests). He served in a leadership capacity with many professional and community organizations including Chairman of the National Forest Industry Associations Council, President of the California Licensed Foresters Association, and Chairman of the Northern California Society of American Foresters. He also served as Chairman of the National Council of Forestry Association Executives and the Executive Officer of the California State Board of Forestry's Professional Foresters Licensing Program. David was well known here at the

Board of Forestry. Our condolences go out to his family along with our thanks for his many contributions to California forestry.

Geri Bergen, RPF 885

Born in Brooklyn New York in 1930, Geri passed away October 12, 2018. Geri lived most of her young life in the town of Nutley New Jersey. Some of her favorite childhood



memories were her visits to the Poconos and Catskill Mountains where she loved the smell of the woods after summer rain. Geri selected the University of California to complete her forestry studies because it was one of the few schools in the nation that allowed women in the forestry program. She received her Bachelor of Science degree in forestry with highest honors in 1962 and went on to complete two years of graduate study receiving a Master of Arts degree in Botany in 1965. Geri went on to launch her career with the United States Forest Service (USFS) as a Research Forester for the Pacific Southwest Forest and Range Experiment Station. She rose through the ranks to

eventually became the first female District Ranger and Forest Supervisor in the history of the USFS. She retired in 1994 in Nevada City, California. Geri's accomplishments were so varied and broad that the Francis H. Raymond (FHR) Award Committee unanimously selected Geri as the 2019 FHR award recipient for excellence in forestry. The award will be presented posthumously at an upcoming Board of Forestry meeting.

Outreach for Future RPFs by Dan Stapleton

I truly love the opportunity to reach out to young folks and let them know about forestry as a career. Our recent online survey of RPFs and CRMs revealed that our registry is aging with 48% of those who responded to the survey indicating they will retire in the next decade. This provides an enormous opportunity for forward thinking college and high school students to prepare themselves for a career in California forestry.

So far this year I have only had two outreach presentations. One was at Cal Poly San Luis Obispo and another was at Cabrillo College in Aptos, CA. I am prepared to tailor my presentations to all potentially interested groups from high school to university level students, to Boy and Girl Scouts or FFA. Please help me to pass the word about careers in forestry and send me any suggestions you may have about groups who may be interested in hearing about career development and opportunities in the forestry field. Call the Office of Foresters Registration 916-653-8031 or email me at dan.stapleton@bof.ca.gov.

Disciplinary Actions Report

Since the last issue of the Licensing News, no new complaints have been filed and

one case remains open as follows:

CASE NUMBER:

335

ALLEGATIONS:

It is alleged that from 2017 through 2018 the RPF on numerous occasions did not sufficiently survey for and protect archaeological resources on numerous Emergency Notices.

AUTHORITY:

The Executive Officer is currently investigating the complaint for violations under PRC 778(b).



SKOOKUM FORESTER

This edition of licensing news includes a new section titled "Skookum Forester" which is dedicated to those wise and seasoned foresters who remain registered and involved in the forestry community and in forestry issues well past normal retirement age. In this issue we introduce Ralph Osterling, RPF No. 38, owner, President and CEO of Ralph Osterling Consultants Inc. I asked Ralph some questions about forestry and his experience working in the woods:

"My initial interest in forestry began as a kid growing up on the SF peninsula where I did gardening work for neighbors and climbed trees just to get to the top. As a family we went camping in the Sierras and on the coast in the redwoods; special places and special outdoor times. After graduating from high school in '59, I thought it best to go to college, so I went to College of San Mateo and took the basics including chemistry and biology. Bingo, in biology the instructor, Fred Klyver, asked me what I wanted to do during the summer and I told him working for the USFS would be great, but I understand that jobs were really tight. He told me to get the federal applications and send them to the forests that I would like to work in. All of the applications I sent out were turned down except for one sent to the Klamath National Forest. One of Fred's former students was the Supervisor for the Klamath! CFI plots were the tasks of that summer and we walked the sole off our boots and loved it and my career was launched. Probably the most exciting experience was being chased by a bear and the most rewarding was receiving a full year National Science Scholarship. Some of what I experienced at the Forest Sciences Lab at OSU are useful today even at my old age of seventy-seven.

My beliefs in forestry and fire management is that they are dependent upon each other. The narrow minded and short-sighted ESA and special interest groups are effectively

killing the forests with their ideas and abilities to delay projects through the courts. The forests and CA are suffering now in part by those narrow-minded attitudes. Fire is a needed and necessary part of the ecosystem and we must include it in management activities. Sorry Smokey Bear, we do not want to put all the fires out! The air quality folks also are problematic, for we were told the only burn days was when it was raining, (ugh). Ironically the area we wanted to burn was later consumed by a wildfire.

My message for new RPFs, it is important getting the word out and participating at all levels including in grade schools. In one of my classroom adventures while working at PG&E in San Francisco, a 3rd grade student asked me what I wore in the field and I told him of our norm. During that session I was wearing a business suit, so it is clear why he asked the question. Remember that Forestry is both an art and a science in ecosystem management. The RPF freshman class should focus on communication skills including writing and public speaking to convey your scientific skills. Get into the mainstream and brag about being a Forester. My bragging has sent me to international projects and into non-forestry biological projects. Keep your ears open and your blinders turned out wide to get a broader scope. Keep active and offer your expertise."

Thank you Ralph for sharing and keep up the good work!

Opinion: Managing for disturbance stabilizes forest carbon

Matthew D. Hurteau, Malcolm P. North, George W. Koch, and Bruce A. Hungate

PNAS May 21, 2019 116 (21) 10193-10195; View [Full Article](#) at PNAS.

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Forest ecosystems sequester approximately 12% of anthropogenic carbon emissions, and efforts to increase forest carbon uptake are central to climate change mitigation policy (**1**). Managing forests to store carbon has focused on increasing forested area, decreasing area lost to logging and clearing, and increasing forest carbon density. Warming, drought, and wildfires challenge the stability of carbon stored in forests (**2, 3**). By contrast, natural cycles of low-intensity fires in dry forests can, over the long term, promote forest carbon storage by protecting carbon in soil and in large, old trees. The conundrum is how to balance immediate, disturbance-driven carbon loss with long-term, stable carbon storage and account for these risks in policies for forest carbon management (**Fig. 1**).



Fig. 1.

Carbon-management policies would do well to use disturbance ecology to factor in tree mortality risk. For wildfire and other impactful disturbances, researchers now have the capability to incorporate these risks into policy mechanisms that enhance forest carbon storage. Doing so would substantially improve global forest carbon policies aimed at climate change mitigation. Image credit: Shutterstock/Christian Roberts-Olsen.

What has been missing is the explicit use of disturbance ecology to factor in tree mortality risk. For wildfire and other impactful disturbances, our understanding is now sufficient to incorporate these risks into policy mechanisms that enhance forest carbon storage. Doing so would substantially improve global forest carbon policies aimed at climate-change mitigation.

Governments currently use our understanding of natural hazards and societal risk to inform building codes for earthquakes (4) and wildfires (5) and for national flood insurance (6). Underlying these policies are the quantification of the probability of a natural hazard occurring and an assessment of the societal impact. Current carbon policy and management need to use stability and risk accounting based on our understanding of disturbance probability and severity.

For example, one of the largest carbon markets is California's cap and trade program, which is being closely watched by several US states and other countries as a potential model for developing their own markets. California companies can buy forest carbon offsets that may be anywhere in the United States (7). Out-of-state offsets are valued by bid price and standing carbon stores. Yet, this pricing does not account for reversal risks because of disturbance and size variation in tree susceptibility to mortality.

Including these factors in pricing will create incentives to manage forests for greater resilience.

To illustrate this point, we highlight fire because it is the most common disturbance in dry forests worldwide. A combination of changing climate and fire suppression is significantly increasing carbon loss as trees in high-density, fuel-loaded forests die from drought and larger, hotter fires. Failure to account for these factors can destabilize carbon markets and undercut climate-change mitigation efforts.

Small Trees, Big Problem

Compared with large, overstory trees, small trees accumulate carbon at a much slower rate and have higher rates of mortality, yet they compete for resources with large trees. In seasonally dry forests, fire reduces small-tree density, spurring growth in large, long-lived trees that store more carbon. Fire suppression in these forests favors small-tree establishment and survival, boosting carbon stores to temporarily exceed that of frequently burned forests.

This additional small-tree carbon, however, is unstable and prone to shifting the natural disturbance regime from low- to high-intensity fire while increasing drought susceptibility that puts the stand's major carbon stocks, the large trees, at risk. By this approach, a short-term increase in a vulnerable pool of forest carbon increases the risk of carbon loss from an otherwise more resistant pool. Current forest carbon policy does not recognize the disproportionate contribution of large trees to carbon uptake and the risk of large-tree loss from fire and drought when forests are dense with small trees. Near-term carbon loss from management activities that restore natural disturbance regimes is required to achieve long-term carbon stability in the world's dry, fire-prone forests.

The combined economic, social, and climate costs of increasing area burned by high-severity wildfires are substantial. Over the past 2 decades, forest fires have emitted approximately 167 TgC in temperate North America (8). US federal fire-suppression expenditures for the 3 warmest years on record, at more than \$7 billion, accounted for 20% of total federal suppression expenditures since 1985 (9). Economic losses from individual fire events can be in the billions.

The Right Price

Pricing risk into forest-based mitigation efforts is not new. Voluntary carbon offset programs (e.g., Verified Carbon Standard) and the California compliance program require an evaluation of non-permanence risk and the set-aside of forest offsets generated by the project to insure against reversal risk. Yet, natural disturbance risk ratings are determined based on past data, and the potential for extreme events that cause widespread tree mortality are absent.

The scientific community's understanding of natural disturbance has developed to the point that we can account for this risk in policy and quantify the value of mitigating these risks. For example, our research group employed publicly available data from LANDFIRE (10) to evaluate wildfire risk and thereby weigh carbon stores in different forests across the United States (Fig. 2A). Using the mean fire return interval to estimate a probability of wildfire and a measure of how departed current vegetation is from its pre-fire suppression state to estimate the potential for uncharacteristic wildfire, we show that across the United States, the risk of carbon loss from wildfire ranges from a 1-in-1,000 chance to a 1-in-10 chance. The majority of forests south of 42°N latitude have a 1-in-25 chance or greater of being impacted by an uncharacteristic forest fire.

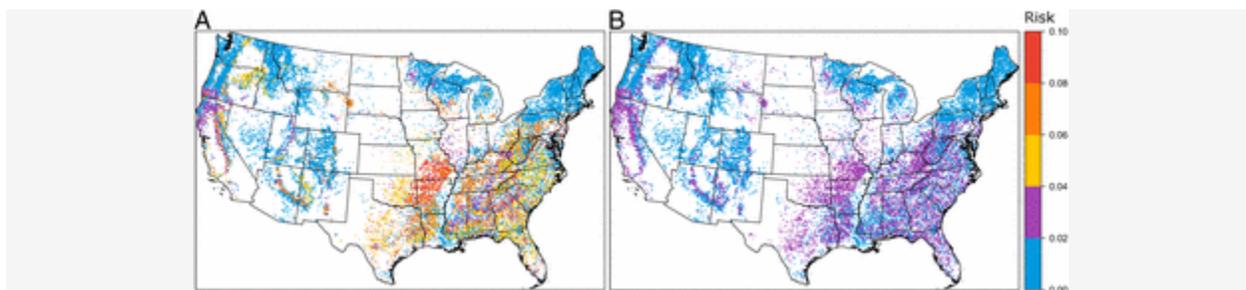


Fig. 2.

The risk rating of different forested areas within the United States. (A) Risk is calculated as $VD \times 1/mFRI \times VD \times 1/mFRI$, where mFRI is the pre-fire suppression fire return interval and VD is an index of how departed the current forest is from that maintained by regular fire. (B) The risk rating declines in frequent-fire forests when management intervention decreases VD to 0.2.

Decades of research in dry forests have demonstrated that management to remove small trees reduces the risk of large, hot wildfires (11), and the efficacy of these activities is central to US national strategy for managing wildfire (11). The approaches for doing so—mechanical thinning, prescribed burning, and managed fire—reduce forest carbon density and emit carbon to the atmosphere (12, 13)—and carry considerable economic costs. Yet, the value of these management activities can be quantified in terms of their contribution to reducing the risk of uncharacteristic wildfires that emit much more carbon than the management activities. Restoring surface fires to dry forests can yield a 60 to 80% decrease in the chance of uncharacteristic wildfires (Fig. 2B).

Better Management, Better Policy

Pricing the reduction in risk conferred by management provides a financial mechanism to stabilize forest carbon stores. The carbon costs of thinning are well established and vary as a function of thinning intensity (12). The choice between no action and management intervention is not binary. With the research community's understanding

of fire, we can allocate more expensive mechanical thinning treatments to the highest-risk areas and use prescribed or managed fire elsewhere, decreasing both the carbon loss and economic costs of treatment (**14**).

Implementing our understanding of disturbance risk to forest carbon storage can be accomplished directly in forest carbon accounting mechanisms—such as the forest protocol for California’s compliance market—and in voluntary programs by developing national-level–data products to quantify the probability of disturbance. Further, this approach could be included in the National Environmental Policy Act (Public Law 91-190) process, which requires that the Federal Government “attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences” (Sec. 101 [42 USC § 4331]). Accomplishing this would require the evaluation of management actions, or lack thereof, on the stability of forest carbon.

Much uncertainty surrounding both carbon stores and uptake in these systems lies in how ongoing climate change will influence the probability of wildfire and the ecosystem trajectory following wildfire. Although some forest loss in semi-arid systems is likely to occur as a result of hotter droughts (**15**), reducing the chance of large, hot wildfires has the potential to slow the rate of loss. The bottom line: There is considerable potential to sustain forests’ role in climate mitigation by assigning economic value to management actions that employ forest disturbance ecology to mitigate the risk of large fires. By doing so, we stand to mitigate extreme fires and encourage better carbon sequestration worldwide.

Acknowledgments

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Footnotes

Any opinions, findings, conclusions, or recommendations expressed in this work are those of the authors and have not been endorsed by the National Academy of Sciences.

Meetings of Interest and Special Announcements

PFEC Meeting Date

The next PFEC meeting will be scheduled for the first week of September 2019. The specific date will be forthcoming on the Board website under announcements. The public is free to attend open session meetings in person. This meeting will focus on renewal and other fees. Agendas and other information can be found 10 days prior to the meeting date at this link: <https://bof.fire.ca.gov/board-committees/professional-foresters-examining-committee-pfec/>

Board of Forestry and Fire Protection Meeting Dates.

The Board's next meeting is scheduled for August 20 and 21 in Sacramento, CA at the Resources Building. The full Board meeting is on the 21st. The remaining 2019 Board meeting schedule has been set and can be viewed online at the following web link: <https://bof.fire.ca.gov/business/meeting-agendas-and-annual-schedules/>

WORKSHOP ANNOUNCEMENT:

The Range Management Advisory Committee (RMAC) will be hosting a workshop titled "The Role of Grazing in Today's Fire Regime – Sustainable Vegetation Management" on **September 16th, 2019**. The workshop will be held in the auditorium of the California Natural Resources Building and will begin at 7:45AM. This workshop will gather representatives from the University of California Cooperative Extension team, CAL FIRE, the California Cattlemen's Association, CalPac SRM, and the Natural Resources Conservation Service for a thorough discussion of the utility of grazing on the landscape, how it is currently being used as a fuel reduction tool across California, and opportunities for the expansion of this tool given California's current fire regime. We hope you will consider attending. For questions or additional information please contact Brandi Goss, Environmental Scientist and staff for RMAC (brandi.goss@bof.ca.gov).

CAL VTP (Vegetation Treatment Program)

The Board of Forestry and Fire Protection (Board) as lead agency pursuant to the California Environmental Quality Act (CEQA) has prepared a Draft Program Environmental Impact Report (PEIR) for the proposed California Vegetation Treatment Program (CalVTP). This PEIR is prepared to provide the public, responsible and trustee agencies, and other interested parties with information about the potential environmental effects of the proposed CalVTP. This PEIR was prepared in compliance with CEQA and the CEQA Guidelines (California Code of Regulations, title 14 [CEQA Guidelines], section 15000, et seq). The Board invites public comments on the adequacy and completeness of the environmental analysis in the document.

IMPORTANT NOTICE: The Board will only respond to comments exclusively pertaining to the CalVTP filed under State Clearinghouse number 2019012052.

PUBLIC REVIEW PERIOD: The CalVTP Draft PEIR is available for a 45-day public review and comment period, which begins June 24, 2019 and ends on August 9, 2019. Please send comments at the earliest possible date, but postmarked no later than August 9, 2019, in order for your comments to be considered.

Written comments are preferred via email and may be submitted to CalVTP@bof.ca.gov. Comments may also be mailed to the following address:

Board of Forestry and Fire Protection
Attn: CalVTP
PO Box 944246

Sacramento, CA 94244-2460

For more information please visit the Board's website at:

<https://bof.fire.ca.gov/projects-and-programs/calvtp/>.

CLFA Meetings and Events 2019 - 2020

CLFA Board Meetings:

- July 27, 2019 - 9:00 am to 3:00 pm – Lyme Redwood, Fort Bragg
- August 24, 2019 - 9:00 am to 12:00 pm - GoToMeeting
- September 21, 2019 – 9:00 am to 3:00 pm – Sonoma – location TBD
- October 12, 2019 – 9:00 am to 12:00 pm - GoToMeeting
- November 7, 2019 - 11:00 am to 4:00 pm – Gaia Hotel & Spa, Anderson
- January 25, 2020 – 9:00 am to 3:00 pm – Granzellas Hotel, Williams
- February 15, 2020 – 9:00 am to 12:00 pm – GoToMeeting
- March 5, 2020 – 11:00 am to 4:00 pm – Gaia Hotel & Spa, Anderson
- April 18, 2020 – 9:00 am to 12:00 pm – GoToMeeting
- May 15, 2020 – 6:00 pm – CLFA Audit – Granzellas Hotel, Williams
- May 16, 2020 – 9:00 am to 3:00 pm – Granzellas Hotel, Williams

CLFA Events:

- November 8, 2019 – 9:00 am to 5:00 pm - Fall Workshop, Gaia Hotel & Spa, Anderson
- November 13, 2019 – RPF Exam Prep Class – Granzellas, Williams
- January 24, 2020 – 10:00 am to 2:00 pm – Cal Fire Meeting, Granzellas Hotel, Williams
- March 6 & 7, 2020 – Spring Workshop, Gaia Hotel & Spa, Anderson

CLFA President's Message

The new President for the California Licensed Foresters Association (CLFA), Christopher Dow, has formulated a letter to the membership noting this year's achievements for CLFA in remaining active in Professional Foresters Licensing and Forest Practice issues. Below is an excerpt from that letter. The full letter can be accessed at www.CLFA.org.

"CLFA has been working to recruit the next crop of foresters. We continue to support the expanding Forestry Challenge program for high school students and are working out the details of certifying forestry technicians through a program administered by the California Agricultural Teacher's Association and Future Farmers of America. We have added a third scholarship and increased the award amounts for all three. The 30 Second Forester videos will hopefully draw in recruits and we are looking for more ways to present the videos to the public. In addition, after the success of our Spring Conference and the devoted support of our membership to develop opportunities for future foresters, we are developing new scholarship programs to further engage our student membership, as well as our students that are working towards their forestry

degree. This year, I aided a student from San Diego who was developing a video documentary about the devastation of the fires in Redding and Paradise. The quality and impact of that video truly hit home for me, as many family and friends of mine lost everything in those fires. The impact these short documentaries could make on educating the public, as well as fostering interest in the forestry field, is a new tool we have in our toolbox, and we are developing a scholarship to highlight it."

It has been a great year for CLFA. The Office of Professional Foresters Registration and the Board look forward to working further with Chris and CLFA in matters relating to California Forestry.

CLFA Archaeology Refresher Courses

Course 171R November 6, 2019 and 172R November 7, 2019 @ Granzella's Conference Center in Williams, CA. Sign up at the link below:

[CLFA November Archaeology Refresher Course](#)

RPF EXAM PREP SEMINARS

We have dates already scheduled for this year to conduct RPF Exam Preparation Seminars. To sign up, click on the attached links. Information and fees will be posted in the coming month.

November 13, 2019 - CLFA Exam Prep Seminar, Granzellas Hotel, Williams California <https://www.clfa.org/workshops-continuing-education/>

November 14 & 15, 2018 - Southern Region Exam Prep and Field Forestry seminar, Mountain Home Demonstration Forest <https://bof.fire.ca.gov/projects-and-programs/professional-foresters-registration/rpfcrm-examinations/>

Renewal Issues

With the conversion to CalTREES, the departure of long time Licensing Assistant Shuhani Patel, and some RPF-CRM Card contract printing errors, mailing of ID cards and renewal receipts has been delayed late into July. We hope to start mailing these items in the coming week. Thanks for your continued patience.

We currently have approximately 80 Registrants who have not sent in their renewal or payment. Renewals sent after July 31 can expect to have a late payment penalty applied to the renewal fee. Please get your renewals mailed ASAP to avoid delinquency and penalty fees.

In Remembrance of Virginia Harwood

Former Board of Forestry member and California timber industry icon, Virginia Harwood, passed away recently. Virginia served on the Board of Forestry under the first



administration of Governor Edward G. Brown Jr. from 1977 to 1985.

Virginia was one of the first woman to serve on the Board and quite possibly the first. Virginia with her husband Bud were the owners and operators of Harwood Products. Harwood Products operated sawmills in Mendocino County for over 60 years, providing much needed jobs to the communities of Branscomb, Fort Bragg and Willits. Harwood closed its operations in January of 2008.

During Virginia's time on the Board and with Harwood Products, she was an ever-present contributor to both California Forestry and Harwood's operations. An interesting link to Harwood's operations can be found [here](#).

Even though Virginia was appointed as an Industry representative, she often displayed independence reflecting a belief that forestry's contribution to California had to be a balance of environmental and economic concerns. Virginia worked with both industry and environmental representative to find common ground which could provide the Board with workable effective regulation.

For those young foresters who have come to know Fort Bragg and Mendocino County only recently, the area was once a bastion of timberland and sawmilling operations. It continues today as an important part of the timber industry. Visiting Mendocino County in the late 90s to witness the steam operated Georgia-Pacific large log mill, the vast decks of logs on prime coastal real estate, and the prominence of the timber industry in general, was truly like stepping back into a different era. Virginia Harwood and Harwood Products were once part of that era, belonging to a cadre of dedicated family-owned timber and sawmilling operators that competed with fortune 500 companies. Today family-owned businesses comprise most of the industrial timberland ownership and sawmill capacity here in California.

XX END XX