



# FORESTLAND STEWARDS

## *Community Resilience*

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Proactive Prep
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Photo Source: Adrian Klein Photography





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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## Home Improvement

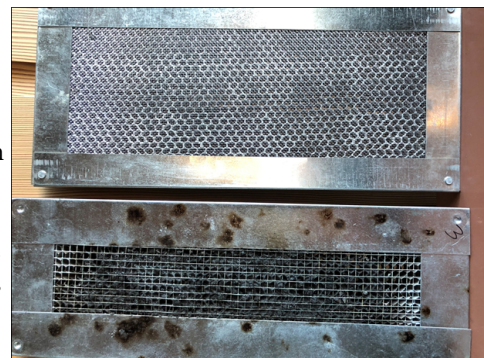
The 2020 California fire season was another record setting year. With more than 4 million acres burned and a significant number of homes that have been damaged or destroyed over the last 4 years, wildfires are no longer bound to the wildlands.

The wildland-urban interface (WUI) is a zone where human development meets or intermingles with undeveloped vegetative fuels. It is the fastest growing land use type in the lower 48 states and has added a new layer of complexity to fighting wildfires in California. What can we do to further protect our homes and communities from wildfire?

In short, buildings must be able to resist three different wildfire exposures - wind-blown embers, radiant heat, and direct flame contact. Most homes are ignited from embers, burning pieces of vegetation or parts of burning buildings, that are carried in the wind and deposited in front of the fire - sometimes up to a mile away. Ember wash can ignite new spot fires on or near buildings. The solution is to help harden homes through fire-resistant construction materials and create defensible space.

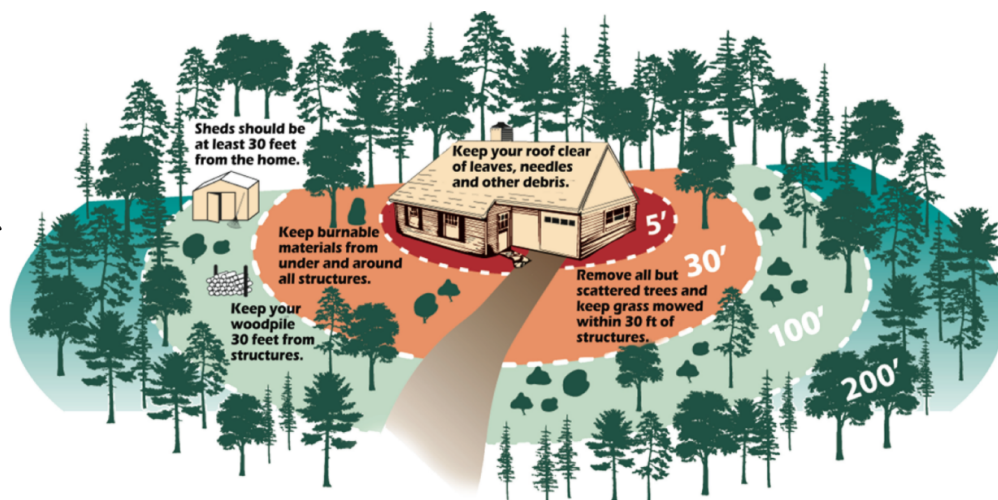
There are low-cost retrofits that homeowners can implement to harden their homes for the range of wildfire exposures, such as installing finer mesh screen over the vents on a house or installing the new flame and ember resistant vents. The table on page 3 summarizes the latest guidance on these issues and incorporates the new critical defensible space information. "This guidance is not getting ahead of ourselves, because over the coming years, Californians will begin to see changes in defensible space guidance and standards as a result of AB 3074 (2020)," said Yana Valachovic, UC Cooperative Extension Forest Advisor. This bill requested that the California Board of Forestry and Fire Protection develop a new defensible space zone within the first five feet of the house and around any attached deck.

"Structures have a much better chance of surviving wildfire through a combination of awareness, good defensible space, and home hardening by incorporating fire- and ember-resistant construction materials," said Valachovic. UC Cooperative Extension has resources available to help. Materials that meet the California Building Codes for construction in the Wildland Urban Interface (WUI) can be found at the California Office of the Fire Marshall. Use the table below to identify priority areas to work on this winter. Keep in mind that the priorities depend on your location and neighborhood. For example, if your home is located very close (<30 feet) to your neighbor's house or to an outbuilding, the 'lower' priority items (such as upgrading windows and siding) rise in importance because of the increased potential for radiant heat exposures.



*Fire-resistant vents. Note how the intumescent film melts under intense heat and closes off vent.  
Photo: Y. Valachovic*

Source: Oak Hill Area Fire Safe Council



**Don't wait for the state – think ahead and improve your defensible space before next fire season!**

Priority	Location	Purpose
1	Roof	Your roof is the most vulnerable part of your house to ember wash. Regularly inspect, maintain, and clean your roof. Make sure to block spaces between roof decking and covering to prevent embers from catching. Clean gutters and consider installing metal gutter guards. When it is time to upgrade, make sure your new roof meets Class A standards.
1	Vents	Vents allow for critical air circulation in a building; however, they can be penetrated by embers and ignite content within the home, especially through roof or under-eave vents. Upgrade existing 1/4-inch vent screens to 1/16-inch or 1/8-inch metal mesh or install the new flame and ember resistant vents. As a temporary strategy, prior to wildfire evacuation, cover vents with plywood or metal tape.
1	Vegetation	Start with the house and work outwards. Remove or relocate combustible plants and mulch within the first five feet of the home and attached decks or stairs. Providing this buffer around the home reduces the potential for ember ignition in this zone and protects the siding and windows from flame contact. Grouping plants into islands in Zone 1 (5-30 feet around the home) will reduce the potential for flames to burn directly to the home.
2	Decks	Remove debris that accumulates on or in between deck board gaps. Do not store combustible materials under the deck. Outdoor furniture, door mats, brooms, umbrellas, and plants should all be relocated in the event of an oncoming wildfire. Decks that overhang slopes are particularly vulnerable and increased defensible space is highly recommended. For new deck installation, when non-fire-retardant treated wood is used, increase the gap to 1/4-inch between deck boards and joist spacing. Apply foil-faced self-adhering flashing tape on the top of each joist.
3	Windows	Remove vegetation immediately outside of the windows. Where radiant heat exposures are possible, install or upgrade to multi-pane tempered glass windows. If the window is within 30 feet of a neighboring home or structure, consider installing noncombustible shutters to close upon evacuation or cover windows with temporary plywood.
4	Eaves	Inspect eaves for gaps around rafter roof tails and blocking. Make sure to plug or caulk gaps. If possible, replace open-eave designs with soffited-eaves and upgrade your vents.
5	Siding	In addition to a 5 foot noncombustible horizontal zone, maintain a 6-inch noncombustible vertical zone between the ground and the start of the siding. Inspect all siding and plug or caulk existing gaps and joints. If another house or structure is within 30 feet, consider replacing your siding with noncombustible or ignition-resistant materials. Gel coatings are not recommended because they are difficult to install and only provide a limited amount of protection time.

***Make sure first responders can easily identify and access your home. Post your address on a noncombustible sign in a highly visible location and make sure your ingress route is wide enough and clear of vegetation to allow firefighting equipment to access your home.***



### INTENSITY VERSUS SEVERITY

Though often used interchangeably, fire intensity and fire severity have different meanings. **SEVERITY** refers to the physical change in the area caused by burning, including impacts to vegetation, litter, or soils. Fire severity is rated on a spectrum from low to high. **INTENSITY** refers to the amount of heat at the flaming front of a fire and is expressed in terms of temperature or heat yield.

Source: The Northwest Fire Science Consortium



Low severity



Medium severity



High severity

## Tools & Tips: Proactive Prep

Preparing for wildfire requires a proactive approach at every level: strategic fuel breaks, defensible space, access for fire crews, water source development, home hardening, go bags, and good family communication plans. In this vein, having tools on hand for use if you accidentally start a fire can help while you wait for fire professionals to arrive to address an oncoming fire.

To maximize the utility of your fire tool kit, consider how it fits in your broader fire management plan. How is the accessibility of your ingress and egress routes? It may save your life during an evacuation. Create an evacuation plan. Drive it a few times to make sure you are familiar with it. Also consider the defensibility of your home. First responders need to triage and make best use of limited resources. The better prepared your property, the higher likelihood that firefighters will be successful in defending it.

- Make sure that there is enough space for firefighting equipment to move onto your property and get as close as possible to your house.
- During incidents, power lines and trees falling across roads are not uncommon. Multiple access points into and out of your property are critical to provide alternate routes in the case of an emergency.
- Roads should be accessible year-round with a 20-foot width and dead ends must have plenty of turnaround space.
- Larger fire engines have difficulty maneuvering steep roads. If you build a road on your property, make sure it has a grade that is less than 5%.



Source: Carol Fall

An accessible and well-marked water source is helpful for incoming resources on a fire. Consider building a small structure that holds hoses and nozzles for water delivery. Keeping equipment out of the elements can help prevent weathering damage or potential vandalism. Make sure that it is unlocked prior to evacuation and your key is accessible for easy access when you are working outside. In the event of a fire, follow evacuation orders to ensure the safety of you, your family, and first responders. Accidents do happen. Transformers blow, fuel leaks on a hot muffler, or burn piles can get out of control. First call 911 to report the fire and initiate an emergency response. If a small fire has started on your property, having the tools available to take immediate action will greatly improve the chances of the fire remaining small and manageable when firefighters arrive on scene.

## The Basics

Tool	Purpose	Cost	Photo
Basic garden hose: 50-ft length; ¾-in diameter	Water is your most valuable resource - keep things simple and have a garden hose and nozzle marked and easily accessible	\$30 - \$200	
Nozzle for ¾-in diameter hose	Water delivery	\$10 - \$30	
Hoe	Hand tool; great for scraping around heated vegetation to prevent spread or putting in control line	~\$70	
Personal Protective Equipment (PPE): Leather gloves, Nomex fire- resistant clothing (cotton pants can be used as a less expensive alternative)	Protection for your skin against heat; do not use synthetic materials as they can melt on your skin and cause severe injury.	\$20 - \$200	
Vertical Water Storage Tank	Water needs to be ample and accessible to give firefighters a water source that can aid them in defending your home	\$200 – \$5,000	
	<b>TOTAL COST RANGE</b>	\$330- \$5,500	

## Got the basics? Consider advancing your fire toolkit with these additions:

Tool	Purpose	Cost	Photo
National Hose ("NH") Single Jacket Hose: 100-ft length, 1-in diameter	Water delivery - Greater diameter and more durable than basic garden hose	\$120 - \$250	
NH Forestry Nozzle Dual Range: 1-in diameter	Water delivery; More durable nozzle for 1-in diameter hose	\$30 - \$80	
Reducer: 1-in to 3/4-in	This reducer will connect 1-in hose to your 3/4-in garden hose for versatility and greater length	\$30 - \$50	
Pulaski	Great for clearing soil in landscapes with thick organic layers and tough roots	\$60 - \$70	
	<b>TOTAL COST RANGE</b>	<b>\$280-450</b>	

**Important Note:** These tables simply represent recommendations of equipment that may be helpful if a small, accidental fire is ignited on your property. If a fire starts, always call 911 and report it before acting. Having these tools on your property is not an excuse to ignore evacuation procedures or local burn restrictions. Follow first responders' directions.



# Managing Erosion

Erosion is one of the most critical issues to address following fire. If your property burned this year, take time to walk around and assess the impacts. While reviewing your property, consider the following:

## How severe was the burn?

Fire severity refers to the effects of a burn on the environment including tree mortality, scorching, and soil impacts. It is dependent on the amount and duration of heat produced. Low-severity fires cause minimal tree mortality, and have a limited effect on overstory trees, shrubs, and soils. Moderate-severity burns have more variable effects on trees and average between 30% – 80% mortality rates with moderate soil exposure. High-severity fires are defined by more than 80% mortality rates and extensive mineral soil exposure. Burned logs and buried wood also cause significant soil heating. Intense heat can change the physical and chemical properties of the soil, which, in turn, may affect the movement of water.

Schedule a site visit with an expert to help determine whether management interventions are required. Sometimes, fire can have positive impacts on the soil and plants by removing thatch, stimulating seeds and cones, and releasing nutrients like nitrogen into plant-accessible forms. Many trees are capable of surviving low-severity burns. Their root systems also help to hold soil and slopes in place. Even partially dead vegetation protects soil from falling rain and reduces winter runoff.

## How does my existing infrastructure look?

Inventory existing infrastructure on your property such as culverts and roads. Look for dirt and rocks blocking drainages, culvert inlets, and outlets. Burned wood may have fallen into the fill base of roads, causing instability. Most significantly, inspect all plastic culverts for damage, as they can burn or melt during wildfire (see photo).

Roads can disrupt natural flows and concentrate water to form damaging gullies. To learn more about the effects of roads on erosion and possible mitigation tactics, reference the Handbook for Forest and Ranch Roads. If control lines and fuel breaks were constructed on the property, seek technical assistance from local agencies to determine whether you need to install water bars.

## EROSION MITIGATION

### Culverts

A common issue following fire is culvert damage. If your culvert is not damaged structurally, but is blocked by sediment or debris, remove the block before the winter rains. A debris rack at the inlet of the culvert may help reduce the probability of developing future blocks, although they can be an expensive fix. Critical dips may also be a potential management option. Culverts with properly constructed critical dips can help keep the water flowing in a stream and prevent diversions should a culvert become plugged with debris or topped by flood flows. However, before building new infrastructure or altering waterways and drainages, make sure you have the proper permits in place. Any alteration to rivers, creeks, or streams that divert or obstruct the natural flow of water requires a Section 1600 Permit from the California Department of Fish and Wildlife (CDFW).

**A myriad of erosion management techniques and strategies exist. Erosion mitigation can be complicated and is often determined on a case-by-case basis. Contact your local Forest Advisor for help.**



*Burned out plastic culvert (30" diameter; 80' length).  
Source: Dr. Ajay N. Jain, Spring Mountain, Glass Fire 2020*

# The Perfect Burn Pile

In California, one of the most effective ways of improving your defensible space and decreasing fuel loads on your property is to pile and burn it. A well-built burn pile encourages full consumption of vegetative materials, reduces the risk of escape, and decreases your exposure to smoke. Burning a pile that is dry with good airflow during proper weather conditions can ensure that smoke rises and minimizes impacts to you and your neighbors.

## Timing

Ideally, start building your burn piles in the summer or early fall before the rainy season begins. After making your piles, throw a tarp over the top to protect it from moisture. This will help the vegetation remain dry until it is time to burn.

## Personal Protective Equipment (PPE)

You should have the following: leather gloves; closed toed footwear; masks covering the mouth and nose; and proper eye protection. Have a shovel, charged garden hose, or buckets with available water nearby just in case.

## Location

Find or construct a wide, flat location on your property. Make sure there are no trees or power lines overhead. Your pile should be at least 10 feet away from surrounding tree trunks and at least 50 feet away from homes or structures. Scrape a 10-ft wide perimeter (yes! 10 feet!) down to mineral soil from the edge of your burn pile prior to igniting. Make sure the perimeter reaches mineral soil and is devoid of burnable debris to prevent potential spread.

## Size

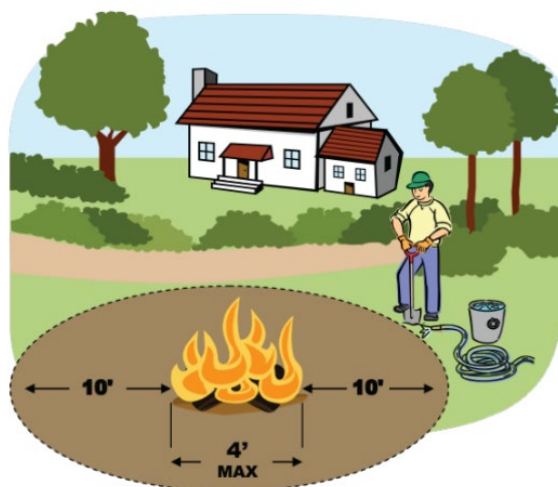
According to CAL FIRE, the maximum pile size is 4 feet x 4 feet. For good consumption and smoke management, make a pile equal in height and width. Larger piles are not advised as they increase the risk of escape. You can neatly stack large “feeder piles” on the side. Once the pile starts burning down, add branches from the feeder piles.

### Reduce the Risk of Escape

Escaped burn piles are a common cause of wildfire.

### Douse It Out

When you are finished burning, spray the spot with water, stir it up, and make sure it's cold to the touch before leaving it unattended.



Source: CAL FIRE

## Structure

After you decide on an appropriate location, start piling brush. Small, dry kindling works well at the bottom of the pile. Pile branches and tops with the butt ends toward the outside of the pile. As you build up, alternate the angle of brushy branches to avoid a lopsided look. After every few layers, use heavier wood to compact the pile, then continue building up. You should end up with a dense, tight pile. Save some heavy wood to place on the top of the pile, especially if you are saving your burn for a later time.

Do not rake wet leaves, needles, and bark into the pile right away. This causes the thick, black smoke that upsets your neighbors! Wait until the fire has grown and use a pitchfork to add small amounts of debris at a time. Do not include vegetative waste like oleanders or poison oak as the smoke is hazardous. Garbage or other manmade materials should not be burned because they emit toxic vapors.

## Clean It Up

If you want to go above and beyond, before igniting, use a chainsaw or pair of loppers to clean up the sides of your pile. This reduces the probability of escape. Add the cut pieces that you trim off to the top. The result should look neat and almost boxy in shape. You want to avoid piles that resemble messy balls of yarn.

## Ignition

If you gathered yard waste during the winter, cover your pile with a tarp so that it remains dry until you're ready to burn. When fuels are dry, ignition should be simple and your kindling should light quickly with just matches and a large ball of newspaper placed within the bottom of the pile. If your fuels are still partially green or the pile is wet from rain or melting snow, you may have to wait until fuels are dry before igniting. Do not use pure gasoline for ignition.



## Check All The Boxes Burn Permits

Prior to burning, ensure that all the proper permits are in place. CAL FIRE permits may be required and are specific to your local CAL FIRE jurisdiction. Reference the CAL FIRE website to apply for a permit and check your county's

"Current Burn Status" prior to pile burning.

If the status in your county is marked as "Burning Allowed," you must still confirm that it's a permissive burn day through your local air quality management agency.

*Violations of any burning permit terms are a violation of state law.  
(Public Resources Code 4421, 4422, 4423, and 4425)*

## Fate of the Redwoods

This past August, the CZU Lightning Complex fire ripped through Santa Cruz and Sonoma Counties, igniting concern throughout the nation about the fate of the iconic redwoods. These resilient trees bear the scientific name *Sequoia sempervirens*, which translates to "always living." Redwoods were given this name, in part, because they have fire-resistant traits like thick bark and an ability to sprout and produce new branches or leaves through adventitious buds. The question many are asking this year is whether the compounded effects of climate change and a century of fire suppression will significantly impact survival rates of second- and old-growth redwoods at Big Basin State Park and other locations in Sonoma, San Mateo, Monterey, and Santa Cruz counties.

"Right now, we have more questions than answers," Angela Bernheisel, State Forest Manager for the Soquel Demonstration State Forest, Santa Cruz Mountains, stated regarding the effects of this summer's burn. "We can't say much about survival rates until we see how the redwood trees respond over the next couple of years, but we do know that the effects are variable across the fire area."

Patience is crucial as foresters, ecologists, and scientists navigate management, rehabilitation, and change. Warmer winters, longer summers, and decades of unbridled vegetative growth may affect our ability to predict the impacts of severe burning on mortality and regeneration rates. Yana Valachovic, Forest Advisor for the UC Cooperative Extension for Humboldt and Del Norte Counties, encourages that the results of past fires may help us glean some insight into redwood survival. In 2003 and 2008, lightning storms ignited the Canoe Fire in Humboldt County and the Mendocino Lightning Complex Fires in Mendocino and San Mateo Counties. The Canoe Fire in Humboldt Redwoods State Park burned during September and October with mixed fire severities. "In general, all of the redwood trees survived except for those in the smallest diameter size classes (< 5 inches)," Valachovic stated. "A few of the old-growth trees failed because fire burned in their basal cavities." In 2008, the heat

effects from the fire scorched and killed many branches. The base of the trees also sustained prolonged heat. After these fires, foresters determined that the level of burn intensity around the tree base functioned as an accurate indicator of impact. Generally, smaller redwood trees, or those less than 9" in diameter, died when more than 25% of the tree bole burned. Larger trees survived unless more than 50% of the tree bole burned.

Since redwoods can sprout new branches, sometimes it is difficult to determine when a management intervention is needed. For those managing for redwood sawlogs, the new branches negatively affect future lumber quality. "If damaged redwood trees survive with a significant amount of defect, then that will be carried on in the stand until those trees are eventually harvested," noted Bernheisel. "The defect will have a negative impact on the value of the timber."

For landowners affected by the 2020 fires who are managing timber for commercial uses, it is important to consult with a Registered Professional Forester (RPF) and discuss whether a salvage operation is needed. "Redwood trees are highly resilient to wildfire, though growth may be impacted for some time," Valachovic concluded.



*Epicormic sprouting on redwood trees several months after the Meyers fire (August 2020) in Sonoma County. Source: Y. Valachovic*

As the Managing Editor for the Forestland Steward Newsletter for nearly 3 years, Kate Campbell was a dedicated environmental writer and photographer. Prior to writing in the interests of private forestland owners, Kate was the assistant editor for the California Farm Bureau Federation's news weekly *Ag Alert*. She unexpectedly passed in September after publishing the Summer 2020 issue. We are grateful for Kate's contributions to this newsletter and we extend our deepest sympathies to Kate's family and friends. Cordi Craig, Conservation Project Coordinator for Placer Resource Conservation District (RCD), will be overseeing the editorial duties for future issues of the Forestland Steward Newsletter.



In fond memory of Kate Campbell. Thank you for your hard work and dedication to the Forestland Steward newsletter.

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Find the FAS for your county:  
<https://www.fire.ca.gov/grants/california-forest-improvement-program-cfip/>

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## Virtual Events Calendar

### Prescribed Fire for Foresters

**Details:** This workshop provides attendees with skills to develop smoke management plans, increase understanding of liability and permit development, and highlight management examples. This series was designed for foresters, resource managers, and anybody with an interest in Rx fire on private lands.

**Contact:** Recordings available on the UC Extension website:

[http://cehumboldt.ucanr.edu/Programs/Fire/Workshops/Prescribed\\_Fire\\_for\\_Foresters/](http://cehumboldt.ucanr.edu/Programs/Fire/Workshops/Prescribed_Fire_for_Foresters/)

### California Oak Health Online Workshop

**Details:** Oak enthusiasts, landowners, natural resource managers, and foresters will enjoy a series of virtual presentations discussing the challenges faced by CA oak woodlands.

**Contact:** Visit the UC Extension website to find the recordings: <http://ucanr.edu/OakHealth>

### UCCE Forestry Resources

**Details:** Various classes and workshops are featured on the UC Extension YouTube channel. Learn about emergency preparedness, post-fire recovery, forest management and more!

**Contact:** Visit the UC Extension Forest Research and Outreach page: <https://ucanr.edu/sites/forestry/> or check out the UCCE YouTube channel and learn at your leisure: <https://www.youtube.com/user/UCExtensionForestry/playlists>

### Ongoing: Sierra Nevada Conservancy Grant Writing Workshops

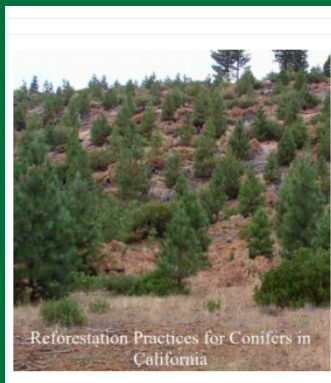
**Details:** Designed to help build the capacity of organizations that serve the Sierra Nevada Region. Workshops are now available as an online webinar.

**Contact:** To organize or attend a workshop, contact your SNC Area Representative, online at <https://bit.ly/2Mpg3pB>

### Online Forest Steward Workshops

- Online weekly classes from 6:00 pm to 7:30 pm.
- In person classes are also offered.
- The latest session (Nov. 3, 2020 - Jan. 11, 2021) is complete, but check the UC Cooperative Extension website for more information: <http://ucanr.edu/forestryworkshops/>

## Reforestation Practices for Conifers in California



*"A practical manual for landowners and managers that explains the why, where, who, when, what, and how of getting sustainable forests back into California's diverse landscape."*

Read full press release here.  
Free download at [www.fvmc.org](http://www.fvmc.org)

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For address changes, please send this box or contact Stewart McMorrow via e-mail, standard mail, or fax. Be sure to reference Forestland Steward newsletter.

*Adapted from original publication: UC Davis Health Newsroom 9/10/2020;*

## Coping with COVID fatigue 2.0: Tips for processing wildfires, smoke, blackouts and more

“With everything people are facing now, sometimes the best strategy is to just do the little things you need to do to survive,” [Kaye Hermanson, UC Davis Health clinical psychologist in the Department of Physical Medicine and Rehabilitation]. “When we feel like there is so much we can’t do, we have to shift our focus to what we can do.” Some of her suggestions [include]:

- **Take it day by day, or moment by moment:** “Don’t look too far down the road,” she said. “Realize you will have good days and bad days, or good moments and bad moments. Realize these things can come in waves. It’s OK to say, ‘Right now, it’s bad.’ Just hang in there and ask, ‘What can I do to help feel better, or less bad?’”
- **Be compassionate with yourself:** Don’t expect perfection and don’t wallow in mistakes or missed chances. “Nobody prepared us for this,” Hermanson said. “We’re all making this up as we go along.”
- **Be creative about finding things to look forward to:** It could be a walk (when the smoke clears), or finding repeats of a TV series you love, or, as in Hermanson’s case, gathering a group of friends for a Zoom trivia night. “We write down our answers then show them. There’s a certain amount of honesty involved,” she said. “We have to remember the purpose is to have fun, not to win.”
- **Find reasons to laugh:** “There is a healthy physical reaction to laughing,” Hermanson said. “If nothing else works, put on your favorite comedy.”
- **Exercise:** “It’s still the No. 1 best thing we can do for coping,” she said. “It releases endorphins and gets some of the adrenaline out when the frustration builds up. Just go for a walk, if you can. If the smoke is bad, exercise indoors. Pull up a yoga or workout video. It helps so much.”
- **Look back, but carefully:** “Don’t think all the way back to...those weeks you spent at the lake,” Hermanson said. “But think about the past few months. We’ve really come a good distance. If you had told me in March what we were about to go through, it would have felt overwhelming. But think about how far we’ve come. Look at all the things we’ve managed. Look at how resilient we’re becoming.”



*Source: UC Davis Health*

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