

Pepperwood's Sentinel Site: A critical asset for understanding the 2017 Wine Country fires

When the Tubbs Fire hit Pepperwood, our Sentinel Site was tracking weather and ecosystem indicators, as it has been day-in and day-out for over five years. This network of sensors, including weather instruments, below-ground probes, and motion-activated cameras, paints a vivid picture of the natural environment as it unfolds on our 3,200 acre research preserve. It generates a gold mine of data on everything from soil moisture to wildlife presence. For half a decade, this data has been used by local and regional agencies and organizations to help maintain our water supplies, keep our forests healthy, and help wildlife survive and thrive. The significance of this platform for assessing fire behavior, impacts, and strategies for recovery has been profiled by the *Press Democrat*, the *Napa Register*, *Scientific American*, and others.

The data we are downloading from our Sentinel Site is critical to better understanding fire behavior in Northern California. While most empirical studies of wildfire behavior have been based on observations in Southern California, now we have an opportunity to improve models of wildfire for our local region. For example, we've been able to use Sentinel Site data in conjunction with Google Earth to map how the fire moved across the Pepperwood landscape. This data can inform response strategies and the deployment of resources in the future.

Given the importance of Pepperwood's Sentinel Site as a primary data source on landscape behavior over time, we have been focused on rapidly restoring the data collection infrastructure damaged by the fire. Staff members have been dedicating their days to restoring Sentinel Site operations throughout the preserve. A silver lining of having to replace the system due to fire damage is that our technology upgrades will utilize current advances in distributed data collection methods using radio relay systems tied to wireless internet communications—allowing us to collect data more efficiently.

Timing is critical for post-fire research

The Pepperwood staff science team mobilized rapidly to conduct time-sensitive assessments of the ecological impacts of the fire on our grasslands, chaparral, and forests. We have been collaborating with multiple university, federal, state and local agencies as well as fellow nonprofits to coordinate post-fire assessments, building off of pilot studies at Pepperwood. These include an assessment of watershed impacts in conjunction with the Sonoma County Water Agency and the US Geologic Survey, forest monitoring with David Ackerly's lab at UC Berkeley, and pre- and post-fire biological surveys of reptiles, amphibians and birds with Sonoma State University.



An oak near the entrance to Pepperwood, post-fire
photo by Michelle Halbur

Stressed? Spend more time in nature!

By Sandi Funke, Education Director

The recent fires have generated incredible levels of emotional stress for our North Bay community. Excess stress can cause serious health challenges. Luckily for us, a cure is right outside our own front doors—nature! Researchers have found that nature immersion can reduce perceived stress levels and blood pressure. Even just looking at natural landscapes can help. As researchers Franco, Shanahan and Fuller (2017*) explain, "benefits associated with viewing nature include reduced anxiety and stress, shorter hospital stays, lower heart rate, and increased directed attention."

The Japanese have taken this knowledge to heart with the practice of Shinrin-Yoku, or "forest therapy." Doctors prescribe walks and guided meditation under the forest canopy to alleviate a myriad of stress-related symptoms. Researchers from Chiba University, who studied this approach, report measurable reductions in cortisol—a stress-inducing hormone—in participants who gazed at forest scenery for just 20 minutes a day.

Here at Pepperwood, we are creating safe opportunities for our community to heal by participating in the regeneration of our local landscape. As spring unfolds, take some time to get out in nature. Revitalize your spirits with delicious fermentations at Pepperwood's Spring Retreat on April 7-8, or wander our meadows on a wildflower walk. Head out to enjoy the land at your favorite local parks and open spaces—you won't regret it!

* Franco, L.S.; Shanahan, D.F.; Fuller, R.A. A Review of the Benefits of Nature Experiences: More Than Meets the Eye. *Int. J. Environ. Res. Public Health* 2017, 14, 864.

Flip to the last panel for highlights of upcoming classes and events.
View a full event listing and register for your favorites at www.pepperwoodpreserve.org.



Volunteers from the Watershed Stewardship Program help clear brush from downed trees
photo by Devyn Friedel

The process of recovery and rebuilding at Pepperwood

When the Tubbs Fire hit Pepperwood the night of October 8, 2017, it burned hottest near the main entrance, scorching the lower five hundred acres and destroying our red barn full of research and restoration equipment, the Hume Observatory, and two staff residences. The fire spread over the remainder of the preserve—at much lower intensities—over the next five days. We spent the initial weeks after the fire navigating the same challenges facing thousands of North Bay residents—finding new housing (in our case for displaced staff members who had lived at Pepperwood), taking stock of our losses, working closely with our insurance providers, and coordinating removal of toxic fire debris. Fortunately, our administrative base at the Dwight Center sustained minimal damage, and staff were able to return by Thanksgiving. Pepperwood's water and telecomm systems require a complete rebuild that is still underway.

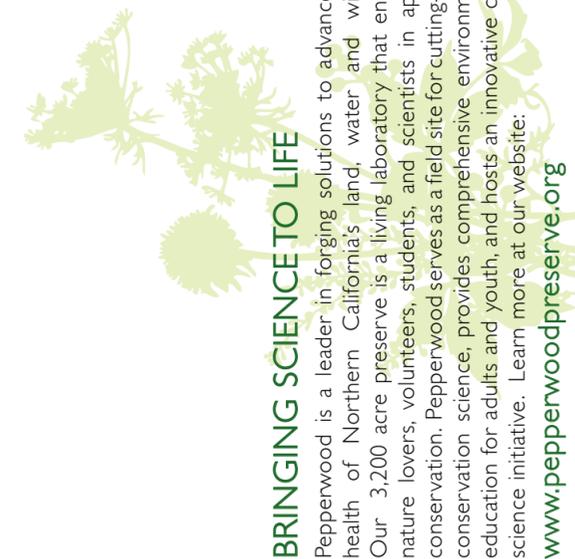
Another monumental task that lies before us is to assess the condition of our wooded areas and to make our trails accessible for time-sensitive research and spring educational programming. We are extremely grateful to the Natural Resources Conservation Service for financial and technical support for treating potentially hazardous trees. While many wooden trail features—including stiles and foot bridges—still need to be replaced, and there are miles of fencing to be restored, we have been able to once again open much of the preserve this spring for guided activities and scientific research.

Lend a hand at one of our upcoming Volunteer Workdays!
Saturday mornings: April 7, May 5, June 9, July 14, and August 4.
To RSVP or for more info: volunteer@pepperwoodpreserve.org.



Pepperwood
PRESERVE
Inspiring conservation through science

Dwight Center for Conservation Science
2130 Pepperwood Preserve Road
Santa Rosa, California, 95404



BRINGING SCIENCE TO LIFE

Pepperwood is a leader in forging solutions to advance the health of Northern California's land, water and wildlife. Our 3,200 acre preserve is a living laboratory that engages nature lovers, volunteers, students, and scientists in applied conservation. Pepperwood serves as a field site for cutting-edge conservation science, provides comprehensive environmental education for adults and youth, and hosts an innovative citizen science initiative. Learn more at our website: www.pepperwoodpreserve.org



Pepperwood
PRESERVE
SPRING & SUMMER 2018
NEWSLETTER



Visitors take in nature's incredible regenerative powers during Pepperwood's first Public Hike since the fires
photo by Nicole Barden

FEATURED ARTICLES:

- POST-FIRE RENEWAL AND REBUILDING
- A NEW FOCUS ON FIRE ECOLOGY

CLASS LISTING ENCLOSED

FROM THE PRESIDENT & CEO

Dear Friends,

As the voices of our elementary school students echo through the Dwight Center courtyard once again, we are filled with gratitude for your support in the face of perhaps the biggest collective challenge our community has ever faced.

Pepperwood has always served as a refuge for plants, wildlife, and people. This spring, as the hills turn brilliant green and the first wildflowers bloom, our hearts are filled with joy as we are now able to welcome you back to the preserve to enjoy healing hikes, workshops, and educational offerings.

We are inspired by our community's passion to reconnect with Pepperwood. Many of our spring classes, hikes and workshops are already sold out. In addition, participation in volunteer workdays has doubled, and corporations, including Levi-Strauss and Kendall Jackson Family Wines, have reached out to lend a hand with their own employees, to help us rebuild. We'd like to offer a special thank you to everyone who has come out to our post-fire volunteer workdays to provide crucial assistance with many time-sensitive restoration projects!

Given the challenges in front of Pepperwood as we rebuild, we are grateful to report that our 2017 year-end was our most successful giving season on record. You stepped forward to bring science to bear on the short- and long-term challenges facing our natural places. You recognized that the road ahead is long and full of obstacles, and you committed to nature and science-based decision making. THANK YOU!

Because of you, Pepperwood's core operations have been restored and we are integrally involved in region-wide rebuilding and resilience efforts. And while we are only just beginning our own infrastructure rebuilding process, knowing we are supported by you ensures we will emerge from these challenges stronger than ever.

Thank you for believing in the power of science as a catalyst for protecting the natural world.

Sincerely,

Lisa Micheli, PhD
President & CEO



photo by Andrea Laue

LEARNING TO LIVE WITH FIRE

Bringing fire ecology into environmental education

Education Director, Sandi Funke, is committed to ensuring Pepperwood's public programs remain not only relevant, but informative and healing. Sandi explains that "we have made major adjustments in response to the fires. We redesigned our public hikes to focus on the theme of ecosystem resiliency. During these on-the-land, interpretative experiences, our wonderful cadre of hike leaders highlight the renewal of the Pepperwood landscape. Our school program now incorporates fire ecology and new elements of reflection to enable our students time to absorb and integrate the changes they see on the way to the preserve and here at Pepperwood."

Sandi has been working with our research team to publish a series entitled *Fire Ecology for Non-Scientists* on our website and in the local press. These concise and informative articles reflect a commitment to educating our community about fire ecology and promoting a deeper understanding of our fire-adapted ecosystem. Sandi and her colleagues at the Sonoma Environmental Education Collaborative (SEEC) have also gathered and shared a compendium of resources for teachers about trauma-informed education and fire ecology, available through the SEEC website at www.sonomacountyee.org.

Day of the Child • Día del Niño

On April 29, Pepperwood and other SEEC partners will host Day of the Child • Día del Niño celebrations at a dozen locations throughout Sonoma County. At Pepperwood, you'll take in the incredible regeneration of the landscape as you enjoy family-friendly activities offered from 10am-4pm throughout the day. No reservations are necessary. Learn more about Pepperwood's celebration at www.pepperwoodpreserve.org, or those offered by other organizations at the SEEC website (see paragraph above).



Education Director Sandi Funke at Pepperwood, post-fire

THE NORTH BAY'S SCIENCE ADVISOR

Providing science to inform post-fire recovery and rebuild

Your support has put Pepperwood on the front lines of the North Bay's collective fire response and recovery efforts, enabling us to work closely with natural resource managers across the region to ensure our community recovers and rebuilds in ways that make us more resilient.

Sonoma County's Watershed Collaborative — Pepperwood serves as science advisor to many of the agencies charged with protecting and managing our natural resources—including local land trusts, open space districts, water districts, and parks—and now Sonoma County's new Office of Recovery and Resilience. Pepperwood provided critical technical support in the creation of the *Watershed Collaborative Report*, coordinated by Sonoma County's Agricultural Preservation and Open Space District. The report provides a set of short- and long-term natural resource management recommendations to the county's Board of Supervisors. Pepperwood President & CEO Dr. Lisa Micheli serves on the steering committee of the Collaborative, and Pepperwood staff members served in each of the working groups that contributed to the report, available at www.sonomaopenspace.org/watershed-collaborative/.

Sonoma County Forest Conservation Working Group — In Sonoma County, over 80% of forest land is privately owned. That means private landowners play an incredibly important role in the health of our forests, including in managing fuel loads. After the 2017 fires, Pepperwood added critical capacity to the Working Group to launch a *Fire-Resilient Forests Initiative* that provides technical resources and learning opportunities to private landowners. In February, Pepperwood held post-fire tree assessment workshops and hosted a community workshop for neighbors in the Franz and Knights Valleys. We're partnering with the California Fire Science Consortium, Sonoma State, Cal Fire, and the US Forest Service to present a *Living with Fire Symposium* May 7-9. For both the general public and conservation professionals, this event will provide insight into science-based solutions for fire resilience. For more information about the Symposium, please visit our website at www.pepperwoodpreserve.org.



Photo taken at Pepperwood by motion-activated camera, post-fire

BRING YOURSELF CLOSER TO NATURE

Demonstrate your love for Northern California

Pepperwood membership is a great way to show your commitment to conservation and the environment! Members are the foundation for our work on behalf of nature, and membership allows you to become part of a dynamic, environmentally-focused community. Our membership program strives to give you what you love best: opportunities to be out in nature!

2018 MEMBERSHIP LEVELS

- \$50 Individual (one adult)
- \$85 Couple (two adults)
- \$110 Family (two adults + children)
- \$35 Senior (aged 63+)
- \$25 Student (valid ID required)

GIFT MEMBERSHIP

Do you know someone who would enjoy being a Pepperwood member? Give them the gift of membership today!

Exclusive hikes • You'll be treated to at least one members-only hiking excursion each quarter to remote and pristine areas of Pepperwood not typically accessible to the public. Our staff and stewards will enrich your experience through their wealth of natural history knowledge.

Behind the scenes • Get in depth with two special events each year, ranging from updates with our President & CEO to intimate get-togethers with scientists discussing today's most important conservation issues.

Discounts and early registration • Pepperwood members receive early registration on all classes and a discount of at least \$5 on those with a fee.

Last, but definitely not least • With Pepperwood membership, you become part of a strong foundation working to secure a healthy and vibrant Northern California!

Already a member? Not a member but want to help us rebuild?

Every dollar you donate beyond your membership level will go directly toward rebuilding Pepperwood. Become a member or make a donation to help Pepperwood rebuild by using the enclosed donation envelope. You can also donate online at www.pepperwoodpreserve.org.

LEGACY GIVING PROGRAM

Interested in making a long-term investment in the health of Northern California's land, water and wildlife? Please consider including Pepperwood in your estate planning. Contact Julie Bartice for details at jbartice@pepperwoodpreserve.org or (707) 591-9310 x 202.

SPRING & SUMMER 2018 CLASSES & EVENTS

Register today at www.pepperwoodpreserve.org

There is no charge to attend the events listed here unless otherwise indicated. Donations are greatly appreciated! All classes require registration except for those marked with an asterisk (*). To view complete offerings including descriptions and registration details please visit our website.

APRIL

6 | DISCOVER NATURE
Deep Environmental Consciousness w/ Ben Benson, 7pm lecture *

7 & 8 | SPRING RETREAT
Fermentation and Foodies
2pm-11am (next day), \$200

14 & 15 | Family Overnight
2pm-12pm (next day), w/ Ginger Parish & Michael Gillogly, \$25

21 | Family Walk • Caminata para la Familia, 10am-12pm, ¡Hablamos Español!

29 | Day of the Child • Día del Niño, 10am-4pm, activities all day, ¡Hablamos Español!

WILDFLOWER WALKS
Select dates in April: 13, 15 & 20
10am-12pm each day, registration req.

PUBLIC HIKES
Select Saturdays:
April 14, May 12, & June 9
9am-1pm each day, registration req.

MEMBERS' EVENTS
Cradling our Future: Exhibit Opening Reception and Sunset Hike
Saturday, March 31, 5pm-8:30pm

Members' Wildflower Walk
Saturday, April 28, 9am-1pm

For more about membership visit www.pepperwoodpreserve.org.

MAY

4 | DISCOVER NATURE
Citizen Scientist: Heroes and Hope
w/ Mary Ellen Hannibal, 7pm lecture *

5 | Introduction to Lichen
9am-3pm, w/ Shelly Benson, \$30

6 | Reptile Round Up
9am-3pm, w/ Jeff Alvarez, \$30

12 | Water World: Aquatic Insects
9am-3pm, w/ Frederique Lavoipierre, \$30

19 | Family Walk • Caminata para la Familia, 10am-12pm, ¡Hablamos Español!

DAY OF THE CHILD • DÍA DEL NIÑO

Sunday, April 29 from 10am-4pm*
FREE, no reservations necessary, ¡Hablamos Español!

Join Pepperwood staff for a fun day exploring nature! This family-friendly event will include craft activities, short and easy guided hikes, microscope explorations with local insects, bug catching, bird box building, and more!

Day of the Child • Día Del Niño will also be celebrated at 11 other sites around Sonoma County! Learn more at www.sonomacountyee.org.