Pepperwood PRESERVE

Annual Report 2018

2018 TeenNat interns help assess the impacts of the Tubbs Fire on Pepperwood's redwoods

Advancing the health of Northern California's land, water and wildlife

From the President

Dear Friends,

Without a doubt, the theme of 2018 has been how to bounce back from the shock of our 2017 wildfire season. This includes the Pepperwood team's efforts to restore the facilities and landscapes of the preserve—over 90% of which burned in October of last year. Further, we have been deeply engaged in regional strategies for Sonoma, Napa, and Mendocino counties to build resilience in the face of a rapidly changing climate that is creating increased fire risks.

None of this work could have been accomplished without the incredible support of our community. This year we reflect on Pepperwood's accomplishments through that lens, with great appreciation for the many critical roles you have played.

Here we share the amazing flurry of activity among our staff and research affiliates to utilize the preserve as a living laboratory for studying fire impacts. We are filling a critical data gap, because current statewide fire protection policies are based largely on scientific models derived from studying the behavior of fire in Southern California and the Sierra Nevada. Thanks to you, we are now conducting critical field analyses to improve those models and increase the information base available for those working to mitigate fire hazards and enhance forest health in our region of the Bay Area and beyond.

In response to our community's desire for a better understanding of wildfire, Pepperwood helped produce a *Living with Fire* symposium in May 2018 to answer questions about the causes of wildfire and what people can do to be more prepared to respond to the next event. We achieved this through incredible partnerships with the California Fire Science Consortium, the Sonoma County Forest Conservation Working Group, Sonoma State University, and our diverse science affiliates. The proceedings, presentations, and support materials now comprise an educational treasure trove for individuals and collectives throughout our region responding to this challenge. View these resources online at the link below. *

Pepperwood also completed an inspiring project in partnership with our local land trusts, parks, and open space districts to identify habitat corridors critical to climate resilience across the region spanning from the Mayacamas Mountains to the new Snow Mountain Berryessa National Monument. These corridors also provide an important opportunity for coordinating the kind of landscape-level forest management that will be needed to reduce future fire risks.

Our education team has done an incredible job of rapidly refining our curricula to integrate key messages about fire science. Our elementary school program, SCENIQ, was adapted to serve children impacted by trauma. Working with Save the Redwoods League, we empowered our TeenNat summer interns to conduct unprecedented research on redwood response to fire. Our Conservation Science Interns from the Santa Rosa Junior College are helping to assess the impacts of the fire on wildlife.

None of this could have been achieved without the support of you—
our donors, members, volunteers and partners. For this we are ever indebted.

With gratitude,

Lisa Micheli, PhD
President & CEO
Pepperwood Foundation

* Full-length expert presentations on fire ecology and building community resilience from the *Living with Fire* symposium are now available at www.pepperwoodpreserve.org/livingwithfire

The power of community

A vibrant and growing family of people from all walks of life come together at Pepperwood to make a difference in the future of the natural world

For elementary through postgraduate studies, Pepperwood serves as a living laboratory supporting exploration of the natural world with hands-on science experiences, and in turn, diversifies the field of conservation practitioners.

A growing network of volunteers and interns inspire and support Pepperwood's research, education and restoration programs, as they grow their expertise and serve as ambassadors of the natural world.

Each year, over 6,500 people take part in Pepperwood programs. From preschool to retirement, our community can apply what they learn here wherever they roam.

Thank you for bringing science to life!

Over 30 studies underway by Pepperwood staff and science partners from the Bay Area and beyond are advancing our understanding of how local ecosystems are being impacted by climate change and related threats of drought and fire.

Research conducted at Pepperwood drives how we manage our 3,200 acres. These results are informing strategies for local land trusts, parks, and open spaces—and private landowners.

We take complex science and translate it into conservation action, empowering our region's natural resource managers to make better, evidence-based decisions.

Left: Dr. Lisa Micheli, photo by Joshua Asel. *Background:* View of Mount Saint Helena from Pepperwood in June 2018, photo by Gerald & Buff Corsi, Focus on Nature, Inc.

Helping the wild things roam

You support a growing network of innovators applying science to protect wildlife

After the 2017 fire season many people asked, "what about the wildlife—are they safe?" The plants and animals of California have evolved with fire for over 10,000 years. Within days of the fire, our motion-activated cameras captured the return of wildlife. Within weeks, we recorded black bear, mountain lion, bobcat, and many other amazing creatures that call the preserve home. This question illustrates the importance of collecting data on wildlife populations—a critical data gap Pepperwood has been a pioneer in filling using the internationally-adopted Wildlife Picture Index methodology. Using non-invasive cameras, we can scientifically quantify wildlife abundance over time, enabling us to measure wildlife response to environmental changes and inform strategies—such as habitat corridor protection—to ensure the survival of our wild neighbors for decades to come.

Wildlife camera monitoring

Since establishing North America's first Wildlife Picture Index (WPI) in 2012, we are analyzing data and continuing to monitor Pepperwood and Audubon Canyon Ranch's Modini Mayacamas Preserves to our north. Through our Wildlife Observer Network, we have stimulated at least five other WPI projects in the region with partners. We are now working with Conservation International on a cloud-based data hub platform that will combine data from the growing number of WPI sites to inform habitat corridor protection strategies for our region as a whole.

Career-building experiences

In Spring 2018, four interns from the Santa Rosa Junior College (SRJC) helped catalog over 286,000 images from our WPI cameras! They carefully classified each image and identified species present to build vital conservation data. This partnership provides hands-on experience to local college students interested in conservation careers, including those in the SRJC's Mathematics, Engineering, Science Achievement (MESA) program. Thanks to MESA and the generosity of Pepperwood donors, this paid internship enables diverse students to participate and gain valuable experience.

Above: Black bear and cub, photo by Pepperwood motion-activated camera. *Bottom:* Pepperwood Wildlife Specialist Steven Hammerich *(top)* with Spring 2018 Conservation Science Internship participants *(from left to right):* Eli Krause, Gonzalo Arcidiácono, Louis Williams, and Allie Smith. *Opposite:* Map of M2B Focal Corridors by Morgan Gray, *Data sources:* California Protected Areas Database.

Conserving habitat corridors is key to ensuring the flora and fauna of Northern California can adapt to climate change

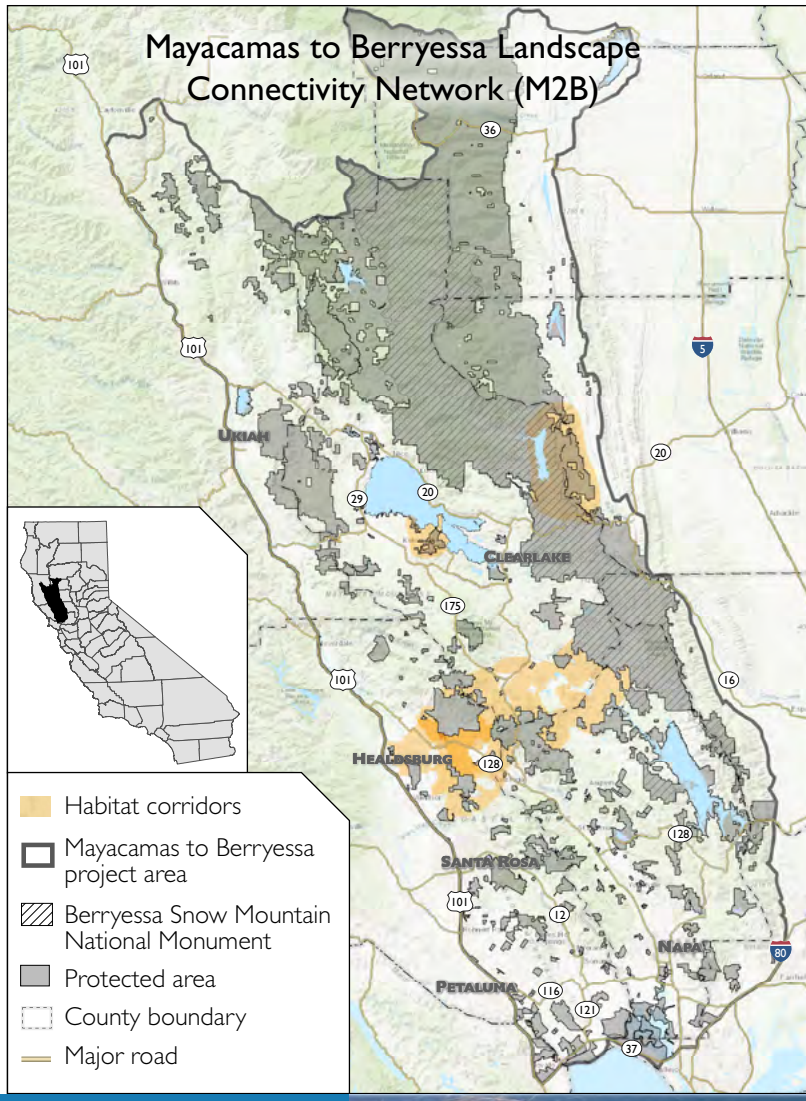
Science shows that plants and animals have always adapted over time to historical shifts in climate by changing their geographic distributions. But with the climate changing faster than ever before, will the natural world be able to keep up? Working with local, state and federal land managers, and UC Berkeley researchers, Pepperwood's Mayacamas to Berryessa Landscape Connectivity Network (M2B) is enhancing tools and strategies for landscape-scale conservation in our region.

Making data matter

Pepperwood is a leader in working directly with land and water managers to co-create "actionable" science products. As the lead on the M2B project, we are the glue between the scientists, managers, and different county teams, as we co-create cutting edge science tools for habitat corridor identification and protection. Results combine the latest climate projections with landscape maps that define corridors providing pathways for plants and animals to adapt to a changing climate. This science-based assessment identified and evaluated critical corridors across our Coast Range region—an internationally-recognized biodiversity hotspot subject to ever-increasing development pressures.

Habitat corridor action plans

In 2018, Pepperwood's M2B project released a set of six priority habitat corridors for protection based on combining our landscape and climate data analyses with expert knowledge on ground-based conditions and emerging conservation opportunities. Each of these corridor projects has been adopted by local land trust and park management partners, who will proceed with action plans likely to combine outreach and land protection (acquisition and easements) with improved habitat stewardship and restoration. The project also lays a foundation for utilizing corridors as a vehicle for coordinating forest management for fire resilience.



Morgan Gray, PhD | *Pepperwood Conservation Analyst*

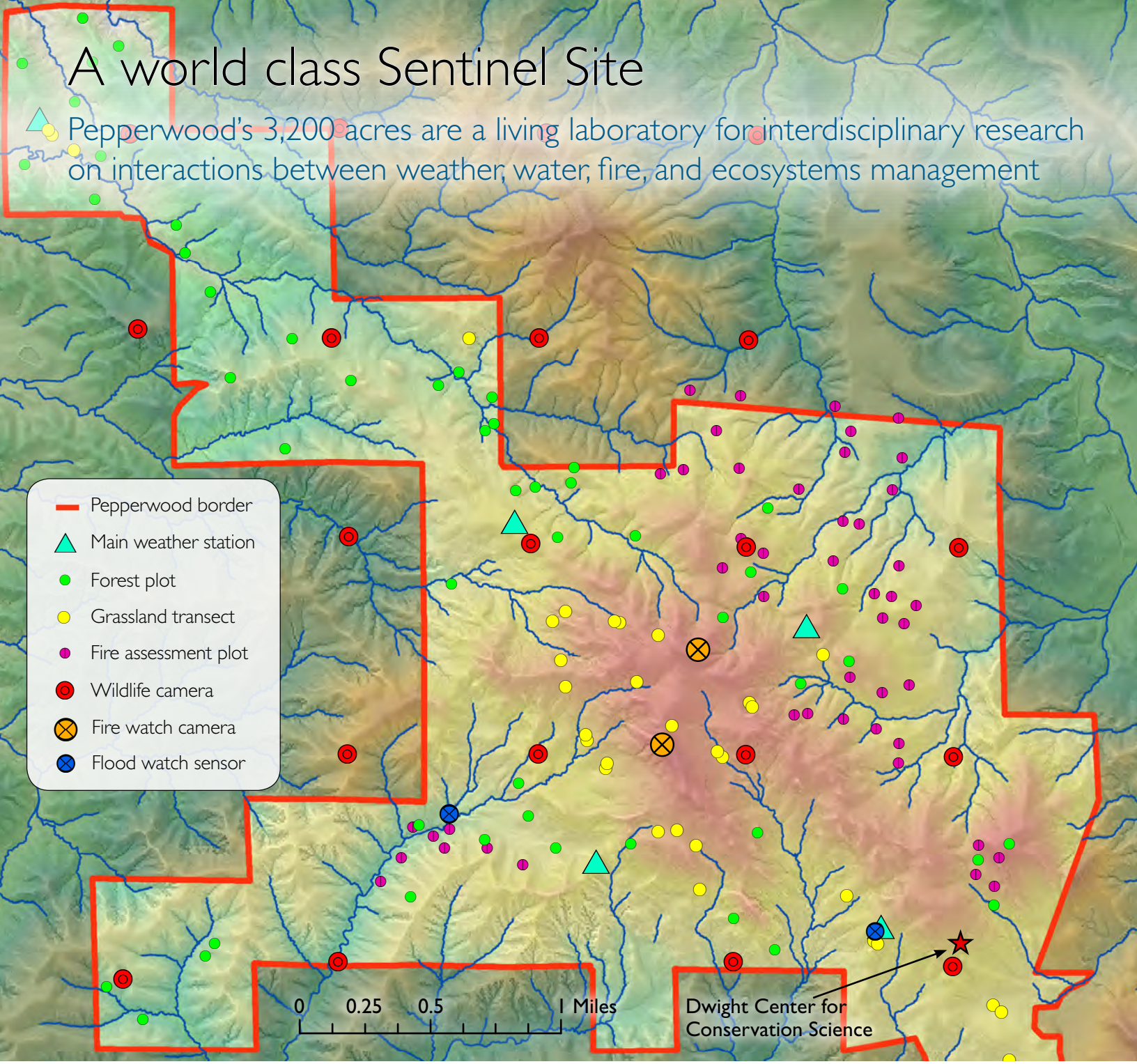
Dr. Gray is an international leader in applying the latest computer modeling techniques to better understand how climate change will impact wildlife. Since completing her PhD at UC Berkeley in the Merenlender Lab, she has been the lead analyst for Pepperwood's Mayacamas to Berryessa Landscape Connectivity Network. Her work involves identifying stretches of land that will provide the most benefit to plants and animals struggling to adapt to new climate regimes—landscapes that are therefore of top priority to protect.

By linking together large open spaces, we can provide plants and animals as much time as possible to adapt to the impacts of climate change. This project provides tools for prioritizing conservation lands based on their projected ability to reduce damaging climate impacts.

- Morgan Gray

A world class Sentinel Site

Pepperwood's 3,200 acres are a living laboratory for interdisciplinary research on interactions between weather, water, fire, and ecosystems management



Watershed, forest, and grassland health

Pepperwood is building a science-based encyclopedia of data on how our local ecosystems behave over time. We measure all aspects of the water cycle through a network of sensors, and track 54 long-term forest plots with UC Berkeley's Ackerly Lab, 32 grassland plots, and diverse wildlife stations throughout the preserve. While we suffered heavy equipment losses in the 2017 fire, thanks to your support we have salvaged data from the old system and are rapidly replacing the monitoring network with upgraded technology and an integrated data management system.

Defining effective land management

In Pepperwood's continued effort to ensure science is actionable and relevant, Sentinel Site data measuring long-term trends is complemented by studies targeted to assess the effectiveness of our land and water management strategies. These in turn help improve best management practices for our local natural resource agencies and private landowners. Management tools under evaluation include prescribed fire treatments, forest thinning, various methods of fuels reduction, conservation cattle grazing, and invasive species control.

Above: Map of Pepperwood's Sentinel Site prepared by Ryan Ferrell, *Data sources:* Sonoma Veg Map, County of Sonoma.

Thanks to you, Pepperwood rapidly adapted to the changing science needs of our community

Pepperwood's research projects were temporarily derailed by the fire, but thanks to your support and the spirit of our indomitable volunteers, we're back on track collecting real-time data and engaging the next generation in cutting-edge research. A silver lining of the fire is that in the rebuild process we are installing all new Sentinel Site infrastructure. This upgraded technology will wirelessly transmit climate and ecosystem data from across our 3,200 acre preserve to our research hub at the Dwight Center for Conservation Science, and in some cases directly to partners including Sonoma Water and the National Weather Service.

Early warning systems

Pepperwood is now hosting specialized equipment as part of two new early warning systems for fires and floods. This fall we are installing two fire watch video cameras, equipped with heat and near-infrared sensors, that will give Sonoma County emergency responders 360 degree views of all the surrounding hills and valleys. The live video stream, also available to the public, will help CAL FIRE and local officials better coordinate disaster response efforts. We have also installed a new standardized rain gauge with Sonoma Water as part of an enhanced warning flood detection system spanning the Russian River and Sonoma Valleys. Our Sentinel Site continues to paint a picture of the health of our preserve, providing high resolution insights into how climate change may be impacting our land, water and wildlife.

Understanding wildfire impacts

With 90% of the preserve impacted by the 2017 fires, we've deployed our own team plus visiting scholars to rapidly assess impacts on our watersheds, forests, grasslands, and wildlife. We are conducting one of the only studies of the fire's ecological impacts on our local iconic trees. In addition, surveys by four expert botanists discovered 12 "fire followers"—plants whose seeds lie dormant for years until a fire—never before documented at Pepperwood. And we helped assemble a team of earth scientists from the US Geological Survey and other partners to measure the impacts of this fire on runoff and erosion, thanks to the support of Sonoma Water. This research fills a critical data gap for our region, and is needed to better estimate post-fire flooding and landslide hazards.

Our partnership with UC Berkeley studies the impacts of climate change on forest health

Melina Kozanitas, PhD | *Postdoctoral Researcher, UC Berkeley, Ackerly Lab*

Dr. Kozanitas led a team of four local college students—two who are alumni of our TeenNat conservation science internship!—who conducted assessments of 54 plots in Pepperwood forests and woodlands. They measured the impacts of the fire on trees that are part of a long-term study by the UC Berkeley Ackerly Lab examining how climate change—and now wildfire—affect forest communities. We're grateful for her leadership and the team's help collecting critical data!

Above: Melina Kozanitas *(center)* with crew members Mic O'Neil and Jessica Diaz.

Stepping stones to science careers

You bring science to life for people of all ages and create unique opportunities for contributions to important research

Teens collect critical data

In its sixth season, TeenNat—our summer conservation science internship for high school aged youth—offered interns an exciting new opportunity to study the impacts of fire on redwoods for Save the Redwoods League. Preserve Ecologist Michelle Halbur trained our 26 interns to measure indicators including scorch height (how far up the trunk of the tree the flames reached) and resprouting (counting and measuring the length of new shoots growing up from the base of burned redwoods). Thanks to these teens—and thanks to all of you who make this program possible through your support—we now have a unique post-fire dataset. Future TeenNat interns and other researchers will continue this study so we can see how these amazingly resilient trees are recovering over time.

Community nature immersion

Our weekend hikes, lectures, and workshops truly offer something for everyone, from art classes to intensive biology explorations. Highlights from the past year include *The Art and Science of Fermentation* retreat—featured in local press—where participants were introduced to the ancient art of producing a variety of tasty ferments. Community members learned about fire ecology through revamped public hikes exploring the impacts of the fire at Pepperwood, and a series of *Fire Ecology for Non-Scientists* articles, which reached thousands of community members.

Committed to inclusivity

In 2018, over 200 family members celebrated Dia del Niño • Day of the Child at Pepperwood as part of a county-wide effort organized by the Sonoma Environmental Education Collaborative. Our school field trip program, Students Conducting Environmental Inquiry (SCENIQ), uses nature journals printed in English and Spanish, and a bilingual educator is present for SCENIQ, Budding Biologists summer camp, and select weekend classes and hikes.

Above: Pepperwood Environmental Educator Nicole Barden *(left)* with a SCENIQ class, photo by Sandi Funke. *Bottom:* TeenNat interns record post-fire data on redwoods, photo by Tom Greco.

Students Conducting Environmental Inquiry (SCENIQ)

In the 2017-18 school year, over 800 elementary school students discovered the natural world through a year-long program at Pepperwood.

TeenNat brings science to high school aged youth

This summer, 26 teens explored Pepperwood, conducting real conservation research and learning about careers in the sciences.

Internships for local college students

Each semester, Santa Rosa Junior College students help analyze wildlife camera data during a career-boosting internship.

Citizen scientists support critical research

Pepperwood Stewards and other dedicated volunteers support research, education, events, and land management throughout the year.

Community education for lifelong learning

Each year, members of our community delve deeper into nature through workshops on topics like mushrooms, reptiles, and landscape painting.

Hands-on experience in conservation science research is a cornerstone of Pepperwood's education programs

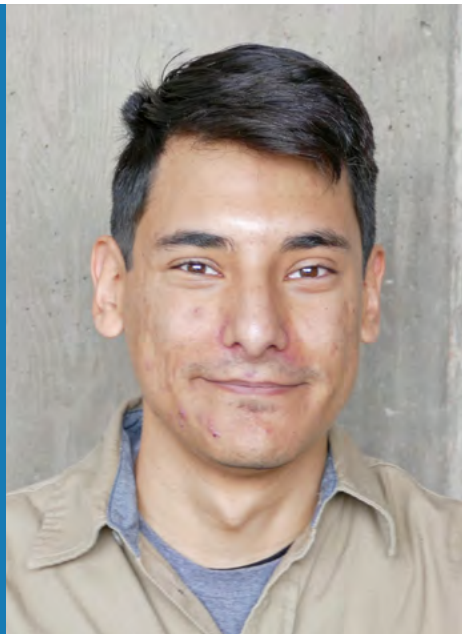
We create opportunities for community members of all walks of life to fall in love with the natural world, make meaningful contributions to research and education, and gain skills and experience transferable to the service of open spaces everywhere. Students and lifelong learners can come as they are and participate now, with more intensive volunteer and citizen science opportunities awaiting those who want to take the next step in their education, career, or retirement.

Gonzalo Arcidiácono | *Conservation Science Intern*

Gonzalo is a Santa Rosa Junior College student in the Mathematics, Engineering, Science Acheivement (MESA) program. For two semesters, he has helped Pepperwood catalog wildlife camera images. He'll be returning for a third semester this fall and will continue serving as a leader and mentor for new interns. We're proud of all that he has achieved, and are grateful for his excellent work toward a better understanding of our local wildlife!

Since starting this internship in Fall 2017, I've switched majors to biology and have learned much about the fauna here. I've been impressed by the resilience of the Pepperwood community in dealing with the wildfires, particularly the support of colleagues to one another. This beautiful place is almost as beautiful as the community that works here.

- Gonzalo Arcidiácono



The Pepperwood family

You are the magic ingredient to Pepperwood's success as an entrepreneurial force, delivering science where it is needed most

Pepperwood members

In 2018 Pepperwood members were some of the first to explore the post-fire landscape here. They also enjoyed an exclusive reception for the *Cradling Our Future* exhibit of Native cradle baskets, hosted by Clint and Lucy McKay of our Native Advisory Council. Members provide foundational support, and membership allows you to become part of a dynamic, environmentally-focused community. Visit our website to learn more about membership and its benefits at www.pepperwoodpreserve.org.

Powered by volunteers

From introducing the community to the recovery of Pepperwood's landscapes on our Public Hikes, to stepping into leadership roles on critical research studies including our post-fire Phenology Project, volunteers are an integral part of the Pepperwood family. Our Stewards program offers more intensive opportunities for our most committed volunteers who have completed the two semester Santa Rosa Junior College *Natural History of Pepperwood* UC California Naturalist certification course.

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 us for details at donate@pepperwoodpreserve.org or (707) 591-9310.

Above: Clint and Lucy McKay of Pepperwood's Native Advisory Council share insights on fire during a members event, photo by Gary Morgret.

Board and staff

Board of Directors

Officers

Herb Dwight, *Co-Founder, Chairman*

Jane Dwight, *Co-Founder, Secretary*

Paul Downey, *Treasurer*

Shannon Bennett, PhD, *Chief of Science, California Academy of Sciences*

Frank Chong, EdD, *President & Superintendent, Santa Rosa Junior College*

Jean-Pierre Conte, *Chairman & Managing Director, Genstar Capital*

William Dwight, *Founder & CEO, FamZoo.com*

Kate Ecker, *Consultant to Social Enterprises*

Roger Nelson, *President, Midstate Construction*

Lisa Micheli, PhD, *President & CEO, Pepperwood Foundation*

Pepperwood Staff

Operations, Communications & Development

Lisa Micheli, PhD - *President & CEO*
Tom Greco - *Communications Manager*
Kelly Kohrs - *Program Associate*
Cassandra Liu, MBA - *Finance & Operations Manager*
Sloane Shinn - *Community Associate*
Margie Shurgot - *Director of Advancement*

Environmental & Cultural Education

Margaret Boeger, MSEd - *Education Director*
Nicole Barden - *Environmental Educator*
Benjamin Benson, MA - *Cultural Resources Coordinator*
Holland Gistelli, MSEd - *Education Specialist*
Clint McKay - *Cultural Consultant*
Jesse Robinson, MAT - *Environmental Educator*

Research & Preserve Management

Tosha Comendant, PhD - *Conservation Science Manager*
Michael Gillogly - *Preserve Manager*
Sonja Barringer - *Facilities Assistant*
Ryan Ferrell, MS - *Research Technician*
Devyn Friedfel - *Natural Resource Specialist*
Morgan Gray, PhD - *Conservation Analyst*
Michelle Halbur, MS - *Preserve Ecologist*
Steven Hammerich - *Wildlife Specialist*

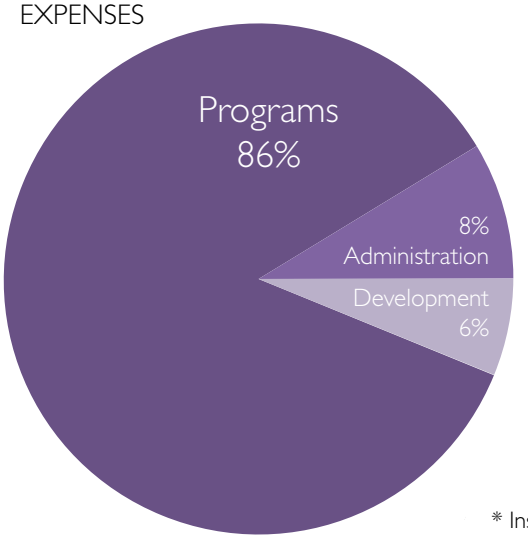
Above: Pepperwood staff *(from left to right):* Micheli, Shinn, Liu, Comendant, Gistelli, Ferrell, Halbur, Robinson, Friedfel, Gillogly, Barringer, Hammerich, Boeger, Kohrs, and Greco. *Not pictured:* Barden *(see page 7)*, Benson, Gray *(see page 4)*, McKay *(see page 9)* and Shurgot.

2017-2018 financials

Statement of Financial Position as of June 30, 2018

Assets	2018
Cash and cash equivalents	$1,889,027
Accounts receivable	8,690
Grants receivable	25,898
Pledges receivable	59,553
Prepaid expenses	31,905
Investments	3,099,801
Property and equipment	19,672,658
Total assets	24,787,533
Liabilities and net assets	
Accounts payable	50,692
Accrued liabilities	109,123
Total liabilities	159,815
Net assets	
Unrestricted	4,777,164
Unrestricted - property and equipment	19,672,658
Temporarily restricted	177,896
Total net assets	24,627,718
Total liabilities and net assets	$24,787,533

EXPENSES



Statement of Activities for Year ended June 30, 2018

Revenue and support	2018 Unrestricted	2018 Temporarily Restricted	2018 Total
Foundation grants	$339,760	$65,000	$404,760
Pepperwood Fund of Community Foundation Sonoma County	1,500,000	-	1,500,000
Contributions	635,439	-	635,439
In-kind contributions	116,993	-	116,993
User and program fees	54,730	-	54,730
Rental income	14,100	-	14,100
Easement revenue	25,000	-	25,000
Miscellaneous	19,928	-	19,928
Government grants	220,215	-	220,215
Unrealized gain on investments	216,656	-	216,656
Interest income	49,627	-	49,627
Special event revenue	190,138	-	190,138
Insurance reimbursements *	2,060,074	-	2,060,074
Net assets released from restriction	77,053	(77,053)	-
Total revenue and support	5,519,713	(12,053)	5,507,660
Expenses			
Program	2,404,026	-	2,404,026
General and administrative	214,482	-	214,482
Development	175,660	-	175,660
Total expenses	2,794,168	-	2,794,168
Change in net assets before depreciation expense	2,725,545	(12,053)	2,713,492
Depreciation expense	335,384	-	335,384
Change in net assets after depreciation expense	2,390,161	(12,053)	2,378,108
Net assets, beginning of year	22,112,698	136,912	22,249,610
Net assets, end of year	$24,502,859	$124,859	$24,627,718

Pepperwood Foundation is a public charitable organization under the 501(c)(3) tax code. The condensed financial data for the year ended June 30, 2018 presented above is subject to audit. Audited financial statements are available upon request.

* Insurance reimbursements represent advances received from our insurance company for replacement purchases and services needed to proceed with programming and rebuilding after wildfire losses.

Above: California newt, photo by Celeste Dodge. *Back cover:* Wildflowers abounded in Pepperwood's meadows after the fire, including this April 2018 California poppy display, photo by Gerald and Buff Corsi, Focus on Nature, Inc.

Pepperwood's mission is to advance science-based conservation throughout our region and beyond

Pepperwood's 3,200 acre scientific preserve and Dwight Center for Conservation Science are accessible to the public through robust environmental education offerings, volunteer opportunities, and a vibrant membership program.

Get involved with Pepperwood!

Volunteer • *Join a hike*

Become a member

Take a class • *Donate*

www.pepperwoodpreserve.org

Pepperwood is located in eastern Sonoma County, approximately 25 minutes from downtown Santa Rosa and just over an hour from San Francisco

Pepperwood PRESERVE

www.pepperwoodpreserve.org | (707) 591-9310
2130 Pepperwood Preserve Road, Santa Rosa, CA 95404

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