

Forest & River News

TREES FOUNDATION

60th Edition

SUMMER 2018

GRASSROOTS CONSERVATION & RESTORATION IN THE REDWOOD REGION

Best Practices in Action

- **A Community-based, Watershed Approach to Organizing Land Owners and Residents in the Emerald Triangle**
- **Eel River Recovery Project Targeting New Watersheds for “Best Practices” Implementation**
- **Patterns of Occurrence: Toxic Cyanobacteria in the Eel River**
- **David Nathan “Gypsy” Chain Memorial Scholarship**



Editor's Note

Summer is in full swing as the rolling hills of Humboldt change to various hues of gold. The rains have subsided and the landscapes that surround us give way to another season of farming. Some might say, “if only these hills could talk—the stories that they would tell.” The hills of Humboldt, Mendocino, and Trinity Counties have been the bearer of fruit for many families and individuals alike—providing a livelihood and a sanctuary. The start of 2018 has brought about a change to this livelihood and the sanctuary that many fled to and relied on for many decades.

Many questions have been posed: How will our county survive these changes? How will the cannabis industry coexist within our natural landscape? How will we, as a community, navigate these transitions and most importantly work together to implement best management practices within our rolling hills and watersheds?

The summer 2018 issue of *Forest & River News* highlights two articles that look at how community collaboration is working to restore, protect, and educate landowners in high risk watersheds that could be impacted by cannabis farms. The initiatives being taken by Sanctuary Forest and Eel River Recovery Project demonstrate the importance of community-based activism, and how starting locally and regionally can make an impact on a larger scale.

We hope that as you read these stories they manifest a sense of hope and pride in what our community is capable of; let them be a reminder that these golden hills rely on our voices and activism.

Cover photo: Harmony among cannabis, a frog hangs out in a cannabis plant.

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Tributary Collectives

A Community-based, Watershed Approach to Organizing Land Owners and Residents in the Emerald Triangle

By Galen Doherty

“Every time we turn around, look at our phone, or talk to someone, a new storyline is developing. We are collectively going through what history may ultimately describe as a once in a life transition.”

**– Terra Carver, Executive Director,
Humboldt County Growers Alliance**

Generation after generation have perpetuated a boom and bust cycle on the North Coast. The Tan Bark logging era at the turn of the century, the redwood lumber industry of the 1930's and 40's, the Gyppo logging industry from the mid 1940's to mid-60's, and the corporate timber industry of present day—each successive cycle has wrought further damage on the wild landscapes and river systems of Humboldt County. During the last go-around, these lands were hit hard, with the majority of merchantable timber removed and the economy contracting, land was sold for next-to-nothing, paving the way for the growth of the cannabis industry. This parcelization of the landscape into small, remote properties resulted in increased population growth and development, and, in some places, a rich counter-culture that valued openness, ingenuity, collaboration, and neighborly good-will. During this time many core community institutions were established, including watershed restoration councils, community centers, radio stations, and more. However, this development also resulted in further land use impacts from year-round use of poorly installed roads, higher water use, and a host of other urban-wildland interface resource management issues.

Many of these back-to-the-landers were “Mom and Pop” growers; pioneers of high-grade sensimilla. They developed distinct



Diversified cannabis and food production at Briceland Forest Farm
PHOTO COURTESY BRICELAND FOREST FARM

strains of high THC and CBD cannabis, earning the counties of Humboldt, Mendocino, and Trinity the “Emerald Triangle” name-brand recognition. Within a couple of generations, the back-to-the-land movement gave way to massive growth in this black market industry; more and more people flocked to the Emerald Triangle to join the green rush. Many growers continuously expanded production, purchasing, leasing, or subletting additional properties, and cutting corners to maximize profits at the expense of the environment and the people who brought this industry into existence.

In February of 2016, Humboldt County adopted the first commercial medical land use ordinance in the State of California. According to Terra Carver, Humboldt County Growers Alliance

Executive Director, “Stakeholders from all perspectives worked hard to develop a framework that protected the environment, public health, and public safety, while seeking the balance of industry needs.” This was followed with a huge spike in demand for ‘grow parcels’, skyrocketing land prices, and just eight months later, the passage of Proposition 64 (Adult Use of Marijuana Act). Now, as the cannabis industry is transitioning out of over 100 years of prohibition, overproduction (among other factors) is resulting in severe loss of profitability. At the same time, many growers are facing immense regulatory burdens to become compliant and operate in a new legal market.

Today, six months into legalization in California, things aren’t going well according to Hezekiah Allen, Cal Growers

Executive Director, “High regulatory cost and a multitude of barriers have prevented most growers in the state from getting permits and licenses. While there is certainly a segment of the population that chose to stay in the unregulated market, the barriers are having a disproportionate impact on the smallest, most modest grows.” In Humboldt, the same small 40-80 acre properties that would have sold for close to \$1M, have been listed with ‘price reduced’ for months, and local realtors feel that we have not yet hit the bottom of the market. During the final days of the timber boom, many loggers recognized they were cutting many times over the growth rate, driving profitability down through oversupply, and taking forestry jobs away from future generations. The green rush is only the latest boom in the North Coast economy. Now we are faced with an impending bust, and as before, many of these small rural communities, directly or indirectly reliant upon cannabis related income streams, will be substantially negatively affected by the loss of this primary economic driver. People who have lived their entire lives under prohibition are faced with an existential crisis: enter into a brand new market and one of the most regulated industries in the nation, or take your chances and continue to operate illegally. These growers face uncertainty with every step: a legal market dominated by big agricultural producers, increasingly strict environmental regulations, high fees and taxes, and a maze of permit requirements from a myriad of agencies.

“The regulatory burden, changing marketplace, and cultural disadvantages make it extremely difficult for small, heritage cannabis farms to survive. We need comprehensive reforms and methodologies for streamlining the process and lowering the cost for these small, marginalized businesses, otherwise, most will not survive.”

**– Casey O’Neil, Vice Chair,
California Growers Association**



McKee Creek Tributary Collective Meeting
PHOTO BY SANCTUARY FOREST

Increasing regulatory and enforcement pressures are not solely limited to the cannabis industry. With extreme low-to-no flows occurring in most streams in most years, higher than average temperatures becoming the new normal, and fish populations continuing to slide, resource agencies are increasingly concerned about addressing the cumulative impacts of all watershed residents, and all land uses. Want to store water diverted from the creek/spring for more than 30 days? You’ll need a Small Domestic Use Registration (domestic water right) for that. Want to sell that produce or trade it with your neighbor? You’ll need a Small Irrigation Use Registration (commercial water right) to do that. Both of these water rights may necessitate a 1600 Lake/Streambed alteration agreement with CDFW, and during a site visit they may tell you to upgrade all of the culverts on your property to their “new standard” 18” diameter, mandate strict forbearance protocols forcing you to stop diverting and invest in more storage (if you can), or require you to address legacy land use

impacts—many of which occurred 40-70 years previously. Between navigating the County, State Water Resources Control Board, North Coast Resource Quality Control Board, and California Department of Fish & Wildlife (CDFW), landowners often choose to get by without permits. And to date, a lack of adequate incentives, education, or enforcement by these agencies has only encouraged this behavior. These strict regulations come with the intention of protecting water sources for humans, fish, and wildlife and improving land management practices, but often times they are unnecessarily complicated, take several years to work through, are overly burdensome to small landowners, and lack any real incentives, especially for those just trying to make ends-meet.

“Officials need to recognize that there are simply too many people on the landscape to enforce their way to regulatory compliance... landowners need clear incentives from their local and state institutions that encourage adoption of best management practices, through tax

credits, or other financial incentives... otherwise the participation of small private landowners will continue to lag and resource management agencies will continue to struggle to make meaningful changes in land management practices"

– Sungnome Madrone,

Project Manager, Mattole Salmon Group

In 2015, thanks to funding from CDFW and the Grace Us Foundation, Sanctuary Forest began an outreach and education effort in six tributaries to the Mattole River with the purpose of increasing cooperative solutions to shared problems. Extreme low flows, poor roads, heavy fuel loads, and so many more resource management issues are bigger than any one landowner can address. To tackle these problems in a cost effective and timely manner people need to work together! Our vision was to facilitate the formation of Tributary Collectives; voluntary, non-regulatory associations of landowners and residents who all live within a given tributary watershed and agree to work collectively to address shared problems. We went about this by holding 2-3 meetings in each of these tributaries and collecting stream flow data to better understand the characteristics of each tributary. In addition, we conducted an anonymous survey to learn more about the residents/landowners: what they value about their watershed, how much water they use and where they get it from, and what issues/concerns they have about their community and environment. Chief among these shared issues was the need to establish road associations; however many participants also expressed interest in working together on shaded fuel breaks, emergency water storage for firefighting, and cooperative solutions to water scarcity. By getting folks together in the same room (generally one of the landowner's homes in the watershed), residents saw how interconnected they are with their neighbors, felt better equipped to apply best management practices (BMPs) on

their land (regardless of land use activity), and were more inclined to work together to address shared issues.

In today's economic climate, working more closely with your neighbors, and being a participatory member of your community may make the difference in being able to stay working on the land or taking up an off-property job to supplement household income. Throughout the North Coast, NGOs are working together with private landowners, not just on a parcel by parcel basis, but with a tributary by tributary approach to address water scarcity issues. A Coordinated Water Management Plan (CWM) is a template being developed by Sanctuary Forest, Trout Unlimited, Salmonid Restoration Federation, and the Nature Conservancy. The goal is for tributary residents to voluntarily commit to a simple workable framework to coordinate instream diversion rates (pumping less than 10gpm) and times (half the residents divert on odd days,

the other half on even days) to reduce cumulative impacts. By adopting a CWM and a shared set of stewardship practices (such as those outlined in the Sanctuary Forest Land and Water Stewardship Guides) folks are taking a big step towards being a Tributary Collective. What is more, they can experience an array of benefits including: water rights with reduced forbearance (no-pump) periods that will translate into cost savings (i.e. buying less water tanks), potentially expedited or group permitting of 1600 Agreements, bulk discounts on water tanks, and grant funding opportunities/shared costs for road work, fire safety, groundwater recharge, and more! Just getting to know your neighbors better can also be helpful with the many small day to day needs such as carpooling, shared child care, big push days on the farm or ranch, you name it!

"These tiny, marginalized businesses are the heritage producers who make up the traditional cannabis production methodology, and we



Streamflow sign on Dudyville Road, maintained by local Tributary Collective comprised of residents of the Mattole Canyon Creek watershed.

PHOTO BY SANCTUARY FOREST

are the most at-risk in the changing marketplace. We need to build models that can help support and maintain small farms; I have long believed that cooperatives are the way to do so. Helping to achieve economies of scale and amplifying shared goals and values, the cooperative model offers a chance for these businesses to work together to address shared circumstances and to thrive in a shifting landscape."

– Casey O'Neil, Vice Chair,
California Growers Association

This spring Sanctuary Forest was awarded additional funding from Humboldt Area Foundation, Grace Us Foundation, and CDFW to continue this important work in the same six tributaries and expand to three new tributaries. Starting this summer and over the next three years we will be conducting outreach and education efforts in collaboration with our Mattole partners and the California Growers Association. We will be

sharing streamflow data, and offering free consultations with permaculture consultants and water rights specialists.

🌲 If you are interested in learning more or would like to get involved please reach out! 707-986-1087 ext. 3# or www.sanctuaryforest.org.



Anna Rogers, Education and Development Director for Sanctuary Forest, stands next to the 2018 Mattole Headwaters Streamflow sign.

PHOTO BY SANCTUARY FOREST

Eel River Recovery Project Targeting New Watersheds for “Best Practices” Implementation

The Eel River Recovery Project (ERRP) is about to engage the community in the Tenmile Creek watershed, as covered in the previous issue of *Forest & River News*, to restore perennial flow, abate non-point source pollution, and to restore the riparian zone basin-wide. While this project is ambitious, ERRP recognizes the need to proceed more widely in other Eel River watersheds, if we are going to make progress on abating ecological impacts related to the cannabis industry.

The North Coast Regional Water Quality Control Board Waiver of Waste Discharge (Cannabis Waiver) for cannabis cultivation is intended to prevent water pollution and has some exacting requirements. Farmers must control all potential erosion sources, including replacing all old culverts on their property regardless of whether a road is in use. This can cost tens of thousands of dollars and rural residential land owners have never been required to meet a similar standard. The Cannabis Waiver also requires that cannabis farmers communicate with their neighbors and devise sub-basin plans for



Summer steelhead stuck at the mouth of Woodman Creek in June 2015.

restoring flow to their creeks, another standard far higher than any similar waiver for other agricultural activities.

These requirements are putting a huge strain on farmers at the same time there

is a major drop in the price being paid for cannabis. ERRP sees the need to bring technical assistance to communities of conscience to plan for compliance with Cannabis Waivers, to restore stream flow, and to abate erosion problems related to roads as well as to avoid all water pollution and restore watershed hydrology. Towards that end, ERRP applied for a Water Smart grant from the Bureau of Reclamation (BOR) in January 2018 to assist residents of the Chamise Creek and Woodman Creek watersheds to form watershed councils and make a plan for basinwide water conservation implementation and pollution abatement, including controlling erosion related to roads. BOR did not select the project for funding, which was not surprising given the Trump administrations unenlightened position on cannabis. However, ERRP is repackaging the grant and will be applying to the



Chamise Creek residents and ERRP contractors at Heartwood in June 2016.



ERRP volunteer and Chamise Creek resident Walker Wise and Woodman Creek Road Association Vice President Eric Voight at the ERRP booth at 2018 Summer Arts Fair.

State Water Resources Control Board for funding in the near future. The reasons for the choice of these two sub-basins as targets has to do with their ecological resilience and also the presence in each basin of cultures of conscience.

The fact that both Chamise and Woodman creeks have significant federal ownership, is a major reason that both streams retain very viable populations of steelhead, trout, and lamprey; and both now will have the potential to support spawning Chinook salmon in their lowest reaches in years with high flow. The big patches of old-growth forest on U.S. Bureau of Land Management lands act like a big water bank that provides higher baseflows in reaches immediately downstream. This means that surface flows in both creeks can be accomplished by winning cooperation of a relatively small number of farmers, when compared to more developed watersheds.

There is an extra incentive for Woodman Creek land owners to restore flows

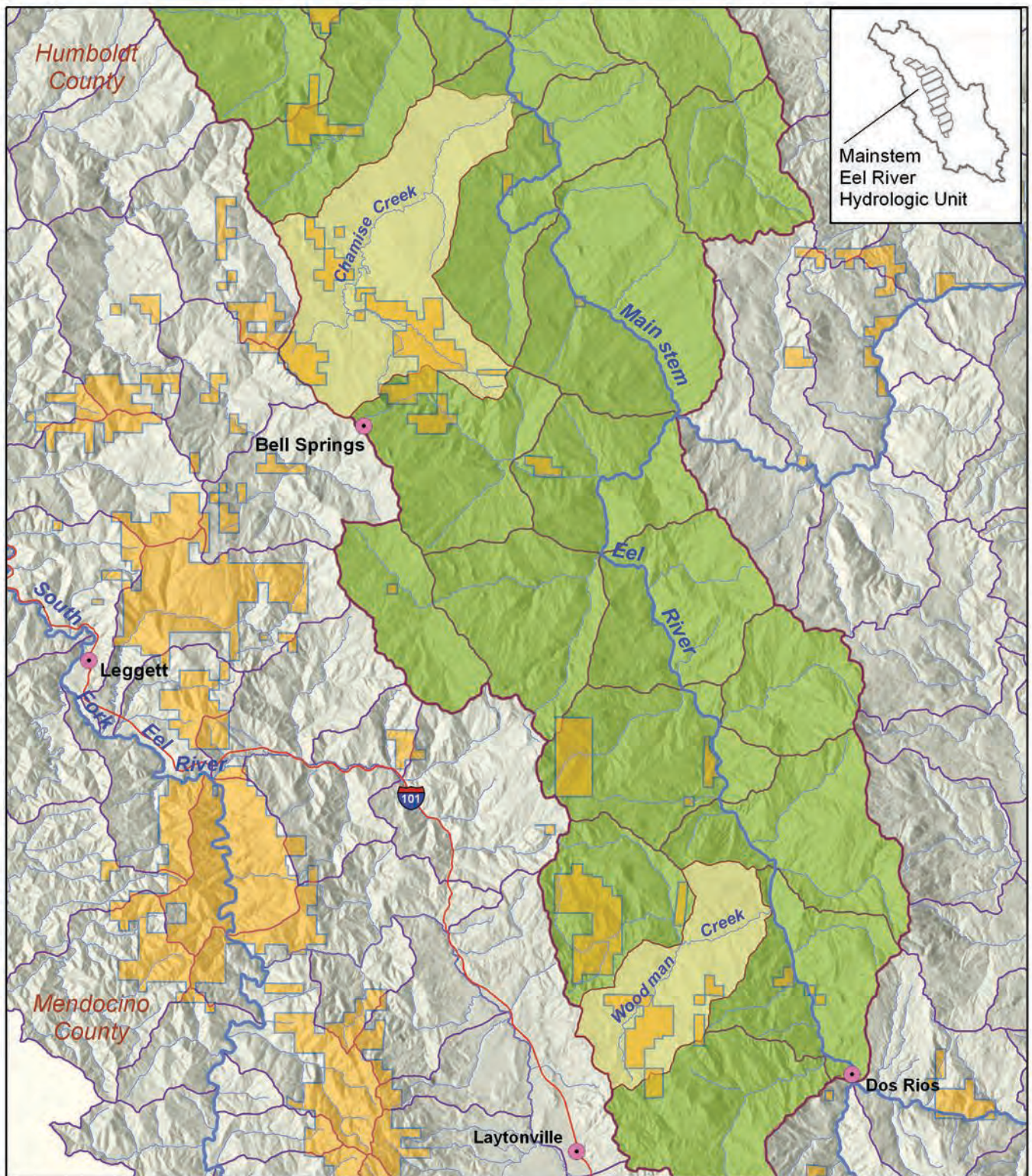
because Cal Trout has obtained grant funding to remove a railroad dike at the mouth (that was constructed in 1910) this fall. Chinook salmon will be able

to access the creek for spawning for the first time in 100 years. If summer flows could be restored, passage would also allow Eel River juvenile salmonids to seek refuge. In June of 2015, ERRP discovered a pair of summer steelhead at the mouth of Woodman Creek when there was no snow-melt to raise flows for the journey to the Middle Fork. Consequently, restoring flows could also provide refuge for adult salmonids as well as juveniles.

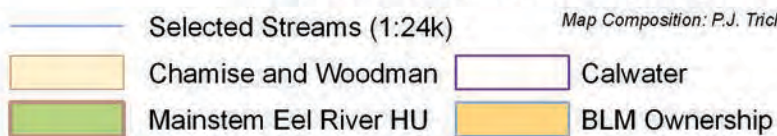
ERRP has been able to establish extensive contacts with residents of both watersheds and has ascertained that there is a widespread desire to work together to improve the health of these creeks while maintaining a flourishing cannabis industry. In June of 2016, ERRP held a meeting to promote agricultural best practices at the Heartwood Institute and we remain in touch with many basin residents. Mickey Bailey at the mouth of Woodman Creek is allowing the removal of the railroad dike on his land and numerous other land owners have worked with ERRP and its contractors during our



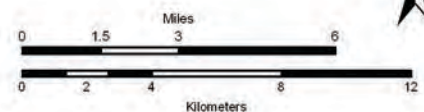
Farmer Mickey Bailey along the railroad tracks on his property just above Woodman Creek where he is allowing removal of the old dike to allow salmon passage for the first time in 100 years.



Location of Chamise and Woodman Creek Watersheds, as part of the Mainstem Eel River Hydrologic Unit within the Eel River Basin



Map Composition: P.J. Trichilo



Map of the Middle Eel River basin by DR. PAUL TRICHILO FOR ERRP.



Mouth of Woodman Creek and dike that will be removed in 2018. ALL PHOTOS THIS ARTICLE BY ERRP

State Water Resources Control Board grant and afterward. A committed group of land owners said they would welcome ERRP's assistance and we will be working with them to get political support as we pursue funding.

For more information:
www.eelriverrecovery.org



ERRP volunteer Proud Savage has been monitoring Chamise Creek since 2012.

David Nathan "Gypsy" Chain Memorial Scholarship

This coming September will be twenty years since David Nathan "Gypsy" Chain lost his life while trying to prevent illegal logging at an Earth First! Action near Grizzly Creek in the Van Duzen River watershed. To mark this anniversary and remember an idealistic young man, we have established the David Nathan "Gypsy" Chain Memorial Scholarship. Administered by the Humboldt Area Foundation, this fund will provide an annual scholarship of \$1,000 for a local high school student or first year student at Humboldt State University or College of the Redwoods, who has demonstrated commitment to issues of forest ecology through volunteer or academic projects.

In addition to assisting students, establishing this scholarship will provide a focus for reflection on changes in our community over the past twenty years. What have we learned since the painful controversies over and in the forest in the 1990s? How have we grown as individuals and as a community? For those of us who knew Gypsy or knew of him, how did his death influence the course of our lives?

We envision a memorial and fundraising event on Saturday, September 15th, and



David "Gypsy" Chain holds down a tree sit at an Earth First! action.

a special program at HSU on Monday, September 17th. Members of Gypsy's family will travel here to attend. Gypsy's mother, Cindy Allsbrooks, will serve on the annual scholarship selection committee; we hope the task will bring her comfort. If you would like to serve on our creative team and help produce the memorial events in September, please contact any of us directly. We will appreciate assistance with all aspects of the project, including designing and facilitating the events, gathering materials for a memorial website, and publicizing the memorial fund and events.

Also, we invite you to participate by making a donation to the Fund. Donations large and small will be appreciated. We have set an ambitious goal of \$25,000, the minimum required for a Fund to continue into perpetuity. In addition to helping individual students, the annual announcements of the scholarship availability and recipients will continue to educate the public about an important

era in Humboldt County history and the ongoing story of the preservation and restoration of the magnificent but fragile redwood ecosystem.

Julia Butterfly will be coming to Humboldt to honor Davis Gypsy Chain and to help bring attention to and raise funds for the David Gypsy Chain Memorial Scholarship Fund. She will attend the memorial event being held in his honor on Saturday, September 15th and will also be cooking a meal and giving a talk on Sunday, September 16th. For more information contact us.

🌲 For more information and to make a donation please see:

www.hafoundation.org/GypsyChain or:

- Marion Nina Amber (Amber), marioninamber@gmail.com
- Naomi Steinberg, rabbinaomisteinberg@gmail.com
- Judee Mayer, jmayer@sonic.net
- Geraldine Goldberg, geraldine1051@gmail.com



David "Gypsy" Chain

Patterns of Occurrence

Toxic Cyanobacteria in the Eel River

Eel River Recovery Project

The Eel River Recovery Project (ERRP), in cooperation with the University of California, has been monitoring cyanobacteria and cyanotoxins since 2013 at strategic locations throughout the Eel River basin. Keith Bouma-Gregson approached ERRP at our annual retreat in October 2012 and asked for our cooperation in monitoring cyanotoxins, and we have been collecting data every summer since. ERRP is about to publish a summary analysis of findings for cyanotoxin data collected from 2013-2017 and Keith has published his doctoral dissertation and been awarded his degree from UC Berkeley. Below is a quick summary of the project and cyanotoxin trends, but all the cutting-edge science is available at the ERRP website.

At initial community scoping meetings in September 2011, that lead to the formation of ERRP, people said that the



South Fork Eel River on Labor Day ALL PHOTOS THIS ARTICLE, UNLESS NOTED, BY EERP

new proliferation of cyanobacteria that produced toxins capable of killing dogs and humans was not OK, and some said they wanted to help monitor. When Keith

offered to train us on how to sample, we already had a willing core of citizen scientists ready to help.

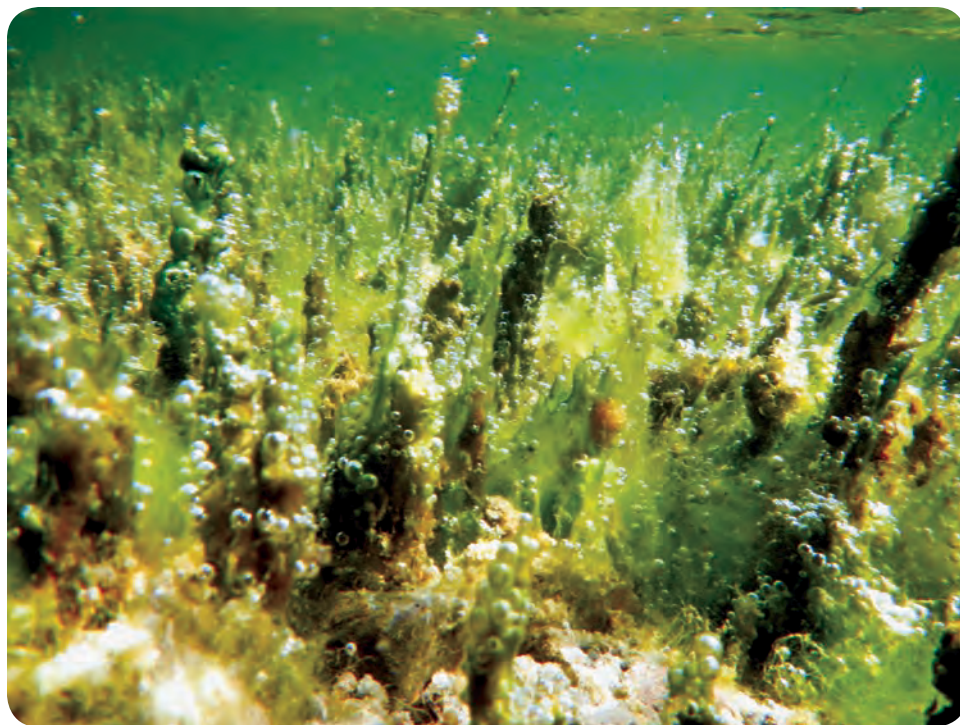
Volunteers included retired Ferndale High School teacher David Sopjes, who assists with lower Eel River monitoring. Sunshine Johnston operates Sunboldt Farms, is on the ERRP Board, and also helps collect data at Holmes on the lower Eel.

Dr. Paul Domanchuk is an optometrist by day, but measures cyanotoxins in the Van Duzen River as a citizen-scientist. He was trained to ID toxic species at a UC-sponsored Algal Foray at Angelo Reserve in 2013 and accepts samples from Eel River residents and checks to see if there are toxic cyanobacteria species present.

On the South Fork Eel, retired California Department of Fish and Game warden Larry Bruckenstein monitors for cyanotoxins just downstream of Sproul Creek. John Filce is a data-systems



Keith Bouma-Gregson training volunteers on the Van Duzen in 2013.



Anabaena on South Fork at Phillipsville. Note oxygen bubbles trapped in colonies that cause segments to float and drift.

developer and research analyst at Humboldt State University and deploys a sensor near his summer place in Myers Flat. John Evans operates Big Bend Lodge and was concerned when children of guests developed swimmers itch in 2013. ERRP Managing Director Pat Higgins paid him a visit, and he has been helping monitor South Fork cyanotoxins above Leggett ever since. In 2014, ERRP expanded coverage to include the Middle Fork Eel River at the request of the Round Valley Indian Tribes Environmental Protection Agency, and we have been cooperatively monitoring with them ever since. Bruce Hilbach-Barger and Dane Downing have been integral to Middle Fork efforts and have also helped RVIT with monitoring of temperature and other parameters of Reservation waters.

When Keith concluded his research, he and UC still supported sampling through 2016. He had developed a cooperative relationship with UC Santa Cruz and Dr. Raphael Kudela, who devised the solid phase adsorption toxin tracking (SPATT)

samplers that are used to measure Eel River toxins. In 2017, ERRP picked up the slack and began to work directly with UCSC and Dr. Kudela. We have also had the good fortune to have the North Coast

Regional Water Quality Control Board join in sampling and they have expanded their coverage to more upper main Eel River stations, including between the dams within the Potter Valley Project.

The geographic extent of the toxic algae SPATT deployment covers the whole Eel River basin, but the patterns of the occurrence of toxicity are not uniform. The most troublesome species of cyanobacteria in the Eel River watershed is Anabaena and it loves warm water and nutrients. Blooms grow rapidly in the edge-waters of the lower South Fork Eel and in the Van Duzen River in some years. Anabaena forms dark green spires, usually on a bed of decaying Cladophora, the good algae that is at the base of the Eel River's food chain. Keith Bouma-Gregson studied the way that Anabaena segments break off from algal mats and float downstream, forming a more innocuous looking scum that can contain deadly neurotoxins. As photosynthesis traps oxygen in the mass of colonial Anabaena, parts of the mass rise to the surface and float downstream.



Phormidium mats near Trout Creek on upper Eel River within the Potter Valley Project
PHOTO COURTESY OF RICH FADNESS, NCRWQCB



John Evans at Big Bend Lodge

A second type of cyanobacteria is Phormidium that grows on the surface of rocks and can be present in high quality water bodies like the upper Black Butte River. Phormidium can tolerate cold water and is a major nuisance in New Zealand, where it poses a major threat to livestock. It also has the ability to bind types of phosphorous not available to other algae and cyanobacteria species. Rich Fadness of the NCRWQCB reports that there was a dog mortality in the upper Eel River within the Potter Valley Project in 2015 and Phormidium appears to be the source of toxins. Microcystin, the toxin created by the cyanobacteria species *Microcystis aeruginosa*, is widespread in the Eel River, but is at such low levels that ERRP and UC studies do not focus on it.

The lower South Fork Eel had the highest consistent toxicity in 2013, but cyanotoxin levels were greater around Piercy in 2014. It is possible that high readings in the latter reach could have been caused in part by Phormidium since *Anabaena* mats are not prevalent nearby. The worst cyanotoxin levels were in the third year of the drought

during the summer of 2015, when high values were found all over the Eel River basin, including in the lower Eel River. The flux of flow in summer makes a big difference in terms of how cyanobacteria mats form and also how much toxicity

they contribute to the river. In the years 2013 and 2014 flows were extremely low, but the stream dropped so rapidly that some side-water areas became desiccated and any toxins volatilized before they could go into the water. In 2015, mid-July rains set up slightly higher flow, and this maintained connection to side-waters where blooms were occurring resulting in the highest cyanotoxin levels measured during the project. The 2016 sampling season had a much higher flow regime and many stations with levels below detection. Cyanotoxins levels stayed low in 2017, with only a few sites with measurable levels.

The pattern of *Anabaena* and cyanotoxin occurrence in the Eel River basin is that toxin levels are higher in drier, low flow years. Cyanobacteria are flourishing in the South Fork because flows are greatly reduced from historic levels, which promotes stream warming. Excess sediment production from lower South Fork tributaries like Salmon Creek causes stream channel shallowing and widening, setting up ideal conditions for growth



Bruce Hilbach-Barger and the RVIT EPA crew

of Anabaena. Keith Bouma-Gregson's work suggests that soil particles may also provide critical nutrients to cyanobacteria. Therefore, soil erosion may also play a role in stimulating blooms. ERRP will continue to work with the Eel River community to restore stream flow and to prevent erosion and water pollution to help restore the river's ecological function. The second major cyanobacteria threat is from Phormidium in the upper Eel River, which was thought to pose less risk to dog and human contact because it grows on substrate in riffles. It seems that it too may be sloughing off senescing segments that can form deadly mats, but this newly discovered problem needs more study.



A SPATTS probe being used to measure Eel River toxins.



Map of locations of SPATTS placed in the Eel River basin from 2013-2017.

In early 2017, ERRP crowd-funded for the 2013-2017 summary study of cyanobacteria, and numerous businesses, non-profit groups, and individuals contributed. We would like to recognize our business and non-profit supporters since 2013 including: Pacific Watershed Associates, the Mateel Community Center, Dazey's Supply, McBain & Associates, Wildberries Market, Ming Tree Realty, Thomas Gast & Associates, North Coast Horticultural Supply, Village Ecosystems, Compliant Farms, Mother Earth Engineering, and Sylvandale Gardens.

ERRP is embarking on another year of basin-wide cyanotoxin and temperature monitoring again in 2018 without any dedicated grant funding. Educational outreach during July about cyanobacteria will be accompanied by a fundraising drive to support this important work.

🌲 Please become a member at www.eelriverrecovery.org. Call 707 223-7200 if you want to volunteer or to request monitoring of the river reach or creek near you.



Diggin' In

The Richard Gienger Report

This 58th “Diggin’ In” column will, in the main, be focusing on “forest health” issues. Forest health is a term pretty much carelessly or loosely bandied about these days. A lot of the background is described in earlier columns and in the news, with the most recent upping of the ante being the recent catastrophic fires north of San Francisco Bay and in Southern California. Closely coupled with “forest health” are carbon sequestration, greenhouse gas reduction, and climate changes. The catastrophic fires have helped to catalyze support for millions of more dollars for a whole range of programs that are a major part of the California budget for 2018-2019. There are a lot more factors in those fires than “unhealthy forests”, and I don’t think they, or the forests will be adequately addressed.

There are at least five, and I’m sure more, reports and processes interwoven as I write. **One** is cited in from the Spring 2018 *Forest & River News*:

“The Little Hoover Commission has just issued a new report [February 2018] on the drought Sierra forest die-backs and fire issues. Check it out via this link: <http://www.lhc.ca.gov/sites/lhc.ca.gov/files/Reports/242/Report242.pdf>. There’s a lot to digest—over 80 pages.

Some cover bigger picture needs for the state. Other recommendations include more prescriptive fire—\$200 per acre for prescriptive fire treatment versus \$800 per acre for wildfire suppression. Lots of practical, subjective, and cultural issues all intertwined. I suggest you also check out their 1994 Report #146 on forestry that has many of the key recommendations unimplemented—like ‘master environmental protection plans’ for all forested watersheds.”

The Second is the April 2018 report from the California Legislative Analyst’s Office: “Improving California’s Forest and Watershed Management”, <http://www.lao.ca.gov/Publications/Report/3798>.

The Executive Summary precedes the Introduction and subsequent sections on Why Forests Matter, Forest Management, Current Forest Conditions, Findings, Recommendations, and Conclusion. There’s definitely an emphasis on spending on ‘practical’ programs dealing with symptoms and not long-term vision and standards to recover truly healthy forests, which will take many generations. Streamlining permits and sale of timber without management plans are two recommendations that give pause for thought. One of the recommendations in the Executive Summary is to “Improve and Increase Funding and Coordination,” which attracted my attention to “Designate the California Natural Resources Agency (CNRA)—rather than the California Department of Forestry and Fire Protection (CalFire)—as the lead agency to oversee proactive forest and watershed health funding and initiatives.” Report 3798 is worth reading for the information provided—and it comes in at a readable 41 pages.

A Third is the current initiative by the Air Resources Board (ARB): “California’s Natural and Working Lands Climate Change Implementation Plan Upcoming Regional Meetings. The California Natural Resources Agency, California Air Resources Board, California Department of Food and Agriculture, and California Environmental Protection Agency invite you to participate in regional public meetings on the development of the Plan.

We ask that you please bring information on existing plans for conservation, restoration, and management priorities and targets as described above to inform our discussion. After the workshop, we



A midway section in Ancestor Creek, just above Sanctuary Forest’s tail crossing to Big Red. This now day-lighted stream was completely buried by a landing built in the stream to a depth from 6 to 12 feet (see red line on photo). This instream landing was just one of many extreme impacts from tractor logging in the Ancestor Creek watershed.

will continue to solicit this information before regional targets are finalized for the Plan.”

There will be a number of regional meetings coming up. Time to bring out your existing plans, folks—and what you think should be in the plan for natural and ‘working lands’. Hoping that Redwood Forest Foundation, Inc. (RFFI) and their Usal Redwood Forest will have strong existing plan presentations.

A **Fourth** is the ever-exciting byzantine California budget process. The Governor puts out a draft budget for the next fiscal year in January. The various 100s or 1000s of issues are raised and the so-called May Revise is released by the Governor—to another round of incredibly intricate negotiations, hearings, bills, trailer bills, pressures, and dual-house conference committees with the intent of having an approved budget by July 1st. Thanks to Paul Mason, a veteran of the Environmental Protection Information Center (EPIC) and Sierra Club California, now playing a major role with Pacific Forest Trust, I was able to call in for Forests Forever to the May 14th Revise Stakeholders Briefing Call headed by Natural Resources Secretary John Laird—and raise some hard questions about the forest health approach in the budget. First, the Governor’s main bullet points:

- ◆ “Doubling the land actively managed through vegetation thinning, controlled fires and reforestation from 250,000 acres to 500,000 acres.
- ◆ Launching new training and certification programs to help promote forest health through prescribed burning.
- ◆ Boosting education and outreach to landowners on the most effective ways to reduce vegetation and other forest-fire fuel sources on private lands.
- ◆ Streamlining permitting for landowner-initiated projects that improve forest health and reduce forest-fire fuels on their properties



The start of a long existent quagmire on a notoriously erosive and stream-impacting portion of Usal Road, Waterfall Gulch. Sediment generated from this road has directly impacted endangered coho habitat in the North Fork Usal Creek. Note the upper portion of the road on the left that was built by desperate motorists to by pass the quagmire.



Same portion of road from photo above after repairs about five years ago by a concentrated team effort on about a mile and a half of the worst sections of Usal Road in Waterfall Gulch. The county, so far, has done timely maintenance! The by-pass road, shown in photo above, was closed off and replaced by proper road drainage directing water off of the road with a rolling dip. Other measures used here, and at many other locations, included heavy rocking and careful sculpting of the road surface to prevent sediment from entering the creek and meeting public safety needs. No more quagmire parties or nightmares here. ALL PHOTOS THIS ARTICLE BY RICHARD GIENGER



A recovering section of Ancestor Creek that was once a very damaging stream crossing of the main haul road. Ancestor Creek is a coho refugia in the headwaters of the Mattole River. This grade control log structure creates pool habituate and helps to stabilize the creek upstream. Just out of the top of the photo is a ridge that was augmented by the 1000's of cubic yards of soil removed from Ancestor Creek and planted by Mattole Valley Redwood seedlings. Organizations involved included, but not limited to: Mattole Restoration Council, Mattole, Salmon Group, Sanctuary Forest, and featuring exceptional work by Macky McCullough and his crew.

- ◆ Supporting the innovative use of forest products by the building industry.
- ◆ Expanding grants, training and other incentives to improve watersheds."

Here's a short transcription of SOME of the exchanges:

"Our first question comes from Richard Gienger, please go ahead. Your line's open:"

rg: "There's a lot of good things in the budget, but I'm really concerned about how to really address the depletion in the forest as a result of the ad valorem period from '46 to '76 to really attain the high quality forest, but also recover other degraded forest resources that [would] really comply with the 1973 Forest Practices Act. These procedures for thinning and control and other things that were mentioned by the Secretary are good things, but the high quality forests—forest health—is something that is a much longer period to attain, because the forests are so depleted. This is a band-aid kind of thing and there really needs to be older, more mature, higher quality forests. Now I really question whether this is going to get it.

JLaird: "Question?"

rg: "The question is how are you going to comply with the Forest Practices Act for high quality forest when the forest is so depleted. And I see that one of the things might be suggested that was in the Legislative Analyst's Office [recent report] about having the Natural Resources Agency be in charge of Forest Health—and let CalFire..."

...

rg: "I question the change that's necessary to actually achieve those goals without setting the standards for what a sustainable forest really looks like—and giving incentives, not only to correct problems now, but to actually move toward forests with this larger, older, higher quality—because I don't think the industry has responded adequately to the intent of the original [1973] Forest Practices Act."

Before I go on to the fifth process underway, I'll pass on some of the May Board of Forestry doings. I encouraged them to see "A River's Last Chance", about

the Eel River (as I would encourage you—it's in DVD now), presented by CalTrout & Pacific Rivers Council, and directed by Shane Anderson. Questions came up about the Potter Valley Project—and on that day of the BoF meeting it turned out that PG&E announced their definite decision to divest themselves of the project. I described some of the positives and negatives of the Planning Watershed Pilot Project. My main public forum input was to bring to their attention Richard Wilson's message to them. And by way of a preface, I told the board that, "You're not going to get forest health back with ten years of thinning and prescribed burning. We're talking generations to bring back real forest health that was really completely altered by monetization of these forests without any—no deferred gratification—now, all the time. It goes back to that movie that I told you about."


I went on to convey Richard Wilson's strong feelings about actually implementing the intent of the Z'berg-Nejedly 1973 Forest Practice Act to have quality forests, forest resources, and forest


products, later in May, Richard restated his concerns and what is necessary to 'get-back-on-track' to meet that intent: "hindsight is 20/20. Calfire and the Board of Forestry need to accept that had they followed AB 1492, major mistakes would have been avoided. And now they have to understand they will have to pay for these mistakes at a much higher price than they ever wanted. The only way to correct these mistakes is with qualified trained foresters with boots on the ground."

This column has had a lot about AB 1492, before, and after it became law in 2012. Its positive intents are to make reforms to actually include forest and watershed restoration, increased carbon sequestration, reduced greenhouse gases, and a number of other important actions, like ecological performance—in the spirit of the 1973 act and related laws and regulations.

Ah, the Fifth Process: a huge "climate summit" will be held in San Francisco this September. Check out <https://globalclimateactionsummit.org/boost-carbon-disclosure-ahead-of-landmark-september-summit/> Governor Jerry Brown is a high profile backer of the event.


I Need to Touch on a Few Other Things

 I hear that PG&E will be auctioning off their Potter Valley Project this Fall. Lots of intrigue and acrimony, one should hope—positive potential. Rumors of the Koch brothers, secret deals, closed-door back-rooms, the ugliness of the Scott dam, the crippled habitat, the water diversion dependencies of hundreds of thousands in Mendocino, Sonoma, and Marin counties.


 The Humboldt [State University] Journal of Social Relations Special Issue #40: "The American West After the Timber Wars" is out. Numerous contributors—haven't read any of the articles yet, except my own. The link for the whole issue is <https://digitalcommons.humboldt.edu/hjsr/>

Greg King's article link is <https://digitalcommons.humboldt.edu/cgi/viewcontent.cgi?article=1070&context=hjsr>

My article link is <https://digitalcommons.humboldt.edu/hjsr/vol11/iss40/4>

 Forests Forever is joining the 27 year long struggle for Rainbow Ridge. Go to the Lost Coast League website lostcoastleague.org

 The Salmonid Restoration Federation 2018 restoration award winners are: Nat Bingham Restorationist of the Year—Will Harling and the Mid-Klamath Watershed Council; Gordon Becker Memorial River Advocate Award—Scott Greacen of the Friends of the Eel River; Golden Pipe Award for Innovation—Leo Kuntz; Lifetime Achievement Award—Pat Ruten of NOAA Fisheries, and Alan Ader of the California Conservation Corps

 Late breaking BoF news: Mike Miles, of Mendocino & Humboldt Redwood Company is resigning his Board position and will be replaced by M&HRC's Mike Jani. Mike Miles was most recently the head of science for M&HRC. Mike Jani who got his 'forestry stripes' doing selection forestry in Santa Cruz, headed up M&HRC after they bought the PL/Maxxam property. He was sort of



Richard's grandson measures a huge rut in the road.

To Get Involved

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 California Legislative Information
www.leginfo.ca.gov


 EPIC
wildcalifornia.org

 Forests Forever
www.forestsforever.org/

 RFFI
www.rffi.org

nudged into early retirement by the hiring of Sierra Pacific Industry "get the cut out" bad boys the last couple years.

 Timber Regulation and Forest Restoration Program (TRFR). The report for the Planning Watershed initial Pilot Project of the TRFR is supposed to be done by December and the Scope of Work is still not determined. Go to <http://resources.ca.gov/forestry/> and you might see latest developments—or maybe not.

 Been helping my soon-to-be 12 year-old grandson on a school project. He has taken on, "erosion and land management". With him, and sometimes his younger sister, we've covered a lot of ground: from looking at 20-year-old projects in the Mattole headwaters to the Needle Rock and Roads. His comment after going from Four Corners to Kenny on the CR 431 (Usal Road) was, "The Usal Road makes the Needle Rock Road look paved."

All I can bear for now. Please keep as aware and active as you can. Please support our local non-profit groups, road associations, and your neighbors, family, friends, and others. Tough slogging ahead.

Since arriving in the Mattole Valley of Humboldt County in 1971, Richard Gienger has immersed himself in homesteading, forest activism, and watershed restoration. Richard's column covers a range of issues including fisheries and watershed restoration and forestry, plus describes opportunities for the public to make positive contributions in the administrative and legislative arenas as well as in their own backyards.



LIVING WITH FIRE

Evolving with Fire

Understanding Flammability and Rethinking Burn Windows

This article by Lenya Quinn-Davidson was originally published on Fire Adapted Communities Learning Network's blog.

When was the last time you changed your mind about something important—something that you thought you knew?

This question was posed at a conference I attended recently, and it has lingered with me ever since. I've been mulling it over, coming up with my own personal examples, and I've been asking friends and colleagues to ponder it, too. I love the question because it's asking us to consider how open-minded we really are. And in this era of political and social divisiveness, where it's so easy to become siloed, I think it's more important than ever to open ourselves to new ways of thinking and doing—even around topics that we know well.

I had a revelation last year that seems, in hindsight, embarrassingly obvious. In fact, it concerns something that I've thought and read about for almost a decade, and a topic on which my husband and several of my close friends are published authors: litter flammability. No, not litter on the side of the road (though I have actually considered writing a blog on burn barrels!)—I'm talking about the flammability of leaf litter, and the traits that various plants have evolved to either facilitate or discourage fire.

A few years ago, my husband and our colleague Morgan Varner published a paper on the role of leaf traits in the flammability of California oaks (*Engber and Varner 2012*). For that study, they collected samples and conducted lab burning of litter from 18 different species of oaks, including deciduous and evergreen oaks and both tree- and shrub-form species.

They found that leaf size accounted for most of the variability in the flammability of oak litter, and that California black oak and Oregon white oak—two deciduous species with large, lobed leaves—were the most flammable of them all. This finding corroborated what those of us who burn in these systems know to be true: the big, lofty litter under black and white oaks burns really well, whereas only the hottest fires will burn through live oak litter, which typically consists of dense mats of small, thick leaves. Other studies have done similar comparative analyses of tree species in various regions of the U.S., offering important insight on the relationships of these adaptive leaf traits to woody encroachment, mesophication, and fire management (*Kane et al. 2008, Kreye et al. 2013, Mola et al. 2014, Varner et al. 2015*). Through this lens, we can see that fuels are not random—plants shape fire regimes, but fire also shapes plants.

More recent literature has delved even deeper into the topic of flammability, urging us to move away from a focus on individual traits and toward a more holistic, multiscalar view. Last year, Juli Pausas, Jon Keeley, and Dylan Schwilk published a paper called “Flammability as an Ecological and Evolutionary Driver,” which proposed a novel framework for thinking about flammability (2017). In that paper, they describe three “flammability strategies” for plants that grow in fire-prone ecosystems: the non-flammable, fast-flammable, and hot-flammable, which are defined by different degrees of ignitability, heat release, and rates of fire spread.

Non-flammable plants have special traits that allow them to persist in fire-prone environments, such as thick bark, plant architecture that prevents ignition, leaf structure that provides a dampening effect when it piles up at the base of the plant, and high moisture contents. The authors



Fire enjoying fresh oak litter during the perfect December burn window.
PHOTOS THIS ARTICLE BY LENYA QUINN-DAVIDSON

give the example of some succulents that live in fire-prone systems but successfully avoid burning. Fast-flammable plants are those with traits that promote quick, frequent burning, which then gives the plant a competitive edge over its neighbors. These plants produce fuels that ignite easily and burn quickly, fueling fires that spread rapidly but have relatively low heat release (i.e., are of low intensity). Deciduous oaks and long-needle pines are good examples of fast-flammable plants. Hot-flammable plants are those that burn hot and for which individual survival sacrificed in the name of reproduction. These plants tend to be effective post-fire seeders and/or resprouters, and naturally include serotinous species, whose cones require high-intensity fire to open and release seed.

Intellectually, I find the flammability topic compelling. It's neat to think about how fire not only shapes the current distribution and composition of plant communities but that it may also be the driving force behind the evolutionary structure of the plants themselves. How cool is that?! But from a management perspective, it can sometimes be hard to understand how these slightly esoteric concepts translate to our work on the ground.

And that's where my revelation comes in. For years, I've been burning in California black oak and Oregon white oak habitats here in northern California. The bulk of my prescribed fire experience is in these systems, where we burn to reduce competition from the native invasive Douglas-fir, a fast-growing conifer that is encroaching on oak woodlands at alarming rates. And until last year, every burn I had ever done in an oak woodland

was in or around October, when we can take advantage of dry grass from our Mediterranean summers and hope to kill as many small firs as possible before the rains come in. Everyone I know who burns in oak woodlands burns during this window, including my husband and his crew at Redwood National Park, who probably have the most robust oak woodland burn program in the state. That window is the norm. But guess what? In October, our deciduous oaks still have their leaves! Which means we—the very people who have nerded out on leaf flammability for the last decade—aren't taking advantage of the leaf litter that those trees have evolved to provide! In fact, it's not uncommon for these October burns to blaze beautifully through the open grass, only to peter out under the oaks.

In December, I worked with some local ranchers and did my first winter burn in a white oak woodland, and I finally got to see those fast-flammable leaves in their full glory. A hard freeze the night before sucked the moisture from the litter and one-hour fuels, and without their leaves in the canopy, the trees let in plenty of sun to dry the winter dew. The fresh, fluffy litter was crunchy by midmorning. The forest adjacent to the unit was wet from fall rains, and the surrounding grasslands were imperviously green from the first flush of winter grass. The fire moved quickly through the woodland, roasting every last conifer seedling and posing little threat of slop-over, escape, or overstory damage. It was the perfect burn window, and one that came again in short spurts over the next two months. And my friends at Redwood National Park were green with envy, because their burn plans don't allow for



Dead firs under deciduous oaks in an area that was burned by a Humboldt County rancher in February 2018.

burning after December 31st, and most of their crews are unavailable after fire season ends in late October.

So that's my example of the last time I changed my mind about something important—something I thought I knew well. The information had been in front of me the whole time, but it took me opening my mind to let the information in, to think outside the social norm. And this has me wondering: what else am I missing? What other enlightenment—social, political, scientific—lies in wait for me to evolve my thinking? And it has me asking everyone I know, now including you: what's your example?



Trees Foundation Board Member Lenya Quinn-Davidson is an Area Fire Advisor with University of California Cooperative Extension, in Eureka and the Director of the Northern California Prescribed Fire Council. She works on a wide range of issues, including research, outreach, and policy related to prescribed fire and fire management more generally. Feel free to contact her at lquimndavidson@ucanr.edu.

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The Collector

Coalition for Responsible Transportation Priorities

In transportation planning lingo, a “collector” is a street or road that “collects” traffic from local streets and delivers it to major arterials. The Coalition for Responsible Transportation Priorities isn’t a big fan of this kind of traditional planning—or of car traffic at all—but we still thought it would be kind of funny to name our new weekly North Coast transportation news roundup “The Collector.” As we said in our first edition this February, the new publication “collects transportation news items and delivers them straight to your eyeballs!”

The backstory behind the name of “The Collector” fits well with its content, which is a curated weekly collection of transportation news and information focused on the North Coast, but also including important and interesting items from state, national, and international news. A typical edition contains 8-10 items, each with a pithy, often humorous, maybe a little wonky, and usually somewhat pointed summary, along with a link to an article or other source for more information.

Much of “The Collector’s” content is sourced from other publications. However, we also do our own original reporting. For example, we highlight important items appearing on the agendas of often-obscure government agencies like the Humboldt County Association of Governments and the Del Norte Local Transportation Commission, and we let readers know when an interesting transportation-related bill in the state legislature has been amended or passed a key committee.

“The Collector” also has more-or-less regular features like the “Bike Law Fact of the Week,” where we dive into little-



A bike lane in Arcata, CA was featured in the “Obstruction of the Week” column of the *The Collector*. PHOTO BY CRTP

known but important laws related to bicycling in California. For example, did you know that it’s illegal to block a bike lane with a parked car, trash can, or any other obstruction—and that local governments are supposed to put up signs to ensure this doesn’t happen in problem areas?

Speaking of bike lane obstructions, “The Collector” also recently debuted a “Bike Lane Obstruction of the Week” feature, which includes a picture of an object found in a local bike lane that shouldn’t be there. This is a light-hearted attempt to draw attention

to a serious problem. Objects in bike lanes can be extremely dangerous for people riding in them. Maybe even more important, they send a signal to everybody that bike travel isn’t as serious or important as car travel. After all, we all know how quickly any item blocking a car lane is removed!

🌲 You can sign up to receive “The Collector” by email at transportationpriorities.org/subscribe-to-the-collector. We’re also happy to receive submissions of suggested items we should cover (including pictures of local bike lane obstructions!). Just send an email to colin@transportationpriorities.org.

Two Years of Data Confirm no Frog Impacts from Benbow Dam Removal

Eel River Recovery Project

The Eel River Recovery Project (ERRP) joined yellow-legged frog expert Dr. Sarah Kupferberg for the fifth year to help count frog egg masses before the eggs hatch into polliwogs. For the last three years, Sarah has been assisting California State Parks to minimize impacts to yellow-legged frogs from the removal of the old Benbow Dam foundation, which is now completely removed. Her results suggest no harm.

Yellow-legged frogs mate just once a year, so the number of egg masses are roughly representative of the adult female population and can be used as a population index. Sarah has been studying the Benbow site on the South Fork Eel River since just after annual impoundment ceased, and the baseline number of egg clusters was small. Also, younger females lay smaller



Diane Higgins, Sydney Temple, and Walker Wise in a hotspot for yellow-legged frog eggs just above the East Branch South Fork Eel River PHOTOS BY ERRP

egg masses, and the early counts were dominated by small clusters. As the riparian zone grew, so did the frog population.

In 2016, ERRP assisted Dr. Kupferberg as she transported egg clutches away from areas that would be affected by construction that summer. In 2017, some additional work was done, but potential impact to frogs was limited and did not require relocation. In May 2017, we counted 350 frog egg clusters, which was the highest over the previous four years. Sarah thought the number might be high because all

spawning had to wait for the flow to drop, instead of happening over several weeks.

On Saturday, May 12th, 2018, we counted 295 yellow-legged frog egg clusters, which indicates no decrease from previous population levels and shows that harm from Benbow Dam removal did not occur. There were polliwogs present, which suggested that spawning in 2018 was more protracted compared to 2017. Interestingly, the dam site itself had formed a large depositional point bar across from the bedrock the dam was anchored on. This changed the channel dynamics due to increased focus of flow, with steep channel edges and poor frog spawning habitat. However, frogs just moved to locations immediately upstream and downstream with appropriate warm, shallow margins.

The yellow-legged frog is common in the Eel River basin but in decline in the rest of California due to flow regulation by dams, pesticides, and herbicides, introduced predators, and possibly the effects of climate change.

In 2016 and 2017, there was active Pacific lamprey spawning on the South Fork Eel into late May and a hundred nests or redds just above and below Benbow. This year there were a few dozen lamprey redds,



Just-hatched polliwogs hang over the egg cluster after hatching. PHOTOS BY ERRP

Conservation Partner Organizations at Work

no live lamprey or active spawning, and only two dead lamprey observed. One dead specimen was still fairly fresh and was missing its head. High amounts of otter scat on the river bars suggested that post-spawning lampreys had likely been eaten. Pacific lamprey populations, like the salmon, cycle up and down and the huge abundance of the last several years seems to have receded, but lamprey are spawning all over the watershed in smaller numbers.

The 2018 ERRP water temperature, flow and toxic algae field season is about to kick off. Anyone wishing to volunteer or seeking assistance with aquatic monitoring is encouraged to call (707) 223-7200. A comprehensive summary of cyanobacteria data collected between 2013 and 2017 is due out in the next month. This project is carried out with the support of the University of California Santa Cruz and has no grant funding support.

🌲 Learn more or donate to support ERRP work at www.eelriverrecovery.org.

Forest Carbon Plan Released

Environmental Protection Information Center

By Tom Wheeler, Executive Director

Governor Brown released his long-awaited “Forest Carbon Plan.” I’ll be blunt: the Plan is timber industry advocacy disguised as “science.”

The Plan focuses almost exclusively on greenhouse gas emissions from fire—fire does emit greenhouse gases, but this is a smokescreen for the larger agenda: to cut down more trees. The Plan states that California needs to increase logging to both reduce the fire risk and to move carbon from trees to “long-lived forest products,” also known as wood. To be specific, Governor Brown is calling for doubling the land actively managed from 250,000 acres to 500,000 acres per year. That means logging an area of land the equivalent size of Napa County per year. Scary.

The Forest Carbon Plan almost completely ignores research that finds that California’s in-forest carbon stocks on private land are decreasing because of logging. In other words, our forests have turned from net sequesters to net emitters, losing more carbon per year than they take in. In 2013, the California Air Resources Board commissioned a study that found that between 2001 and 2008, California’s in-forest lost 100 million metric tons of carbon or approximately 14 million metric tons per year. Another study from researchers at the University of California, Berkeley from 2015 reached similar conclusions, finding that loss of above-ground in-forest carbon stored amounted to 5-7% of the state’s cumulative carbon emissions. Along the same vein, Oregon State University researchers found that the timber industry is the largest carbon emitter in the state of Oregon.

California’s forests can do better—and by law, must do better. In 2010, the California Legislature declared that California’s forests must play a larger role in the state meeting its carbon emission targets. AB 1504 directed that the Board of Forestry devise new rules to force timber companies to go beyond the “status quo” and increase in-forest carbon sequestration. Eight years later, the Board of Forestry has not issued any new rules. Instead, the Board has commissioned studies with the intent to prove that existing rules—which allow for large clearcuts and do not restrict the logging of large trees and high-carbon forests—are already best practices. The most recent study commissioned by the Board of Forestry found, contrary to other peer-reviewed science, that California’s forests are sequestering significant amounts of carbon.

Governor Brown has a reputation as a climate champion, so why would he sell out forests? Governor Brown has maintained a close relationship with the timber industry.



Controlled burn on private land PHOTO BY NAT-PENNINGTON

His wife, Anne Gust Brown, served for 14 years in numerous top level roles for The Gap, the retail chain owned by the Fisher family of San Francisco. Humboldt Redwood Company and Mendocino Redwood Company, the largest owners of redwood forests in the world, are also owned by the Fisher family. Robert Fisher, oldest of the Fisher family dynasty, was appointed by the Governor to serve on the Strategic Growth Council; a little-known cabinet-level agency key to Governor Brown's planning for climate change.

A true, science-based Forest Carbon Plan would be easy to construct. Want to increase carbon sequestration? Grow bigger trees, which are capable of putting on more carbon per year and are most capable of surviving a fire or beetle outbreak. How do we grow bigger trees? We cut less, increasing the rotation age for clearcuts and leaving more, older trees when utilizing uneven-aged forestry. Besides resulting in increased carbon sequestration, this management strategy has a myriad of co-benefits, from improving wildlife habitat and clean water, to helping to mitigate for the effects of climate change by promoting conditions that keep forests cool.

🌲 For more information: wildcalifornia.org

The Young Scientists: The Next Generation

Friends of the Van Duzen River

Friends of the Van Duzen River (FOVD) just completed its third federal Kids in the Woods grant, *The Young Scientists: The Next Generation*. The Kids in the Woods programs are matching grants. With the matches, FOVD raised \$150,000 to serve the community. We have taught environmental education to students



Students learning at the Shell Station run by Dr. Bill Shapeero during the Science Faire at the Carlotta Grange Hall. Also in the picture is Jeanie Card, teacher assistant.
PHOTO BY FOVD

from four elementary schools: Hydesville, Cuddeback, Bridgeville, and the Van Duzen Elementary schools as well as Fortuna High School and the Academy of the Redwoods.

The Kids in the Woods grants have been a close collaboration with the Trees Foundation, Six Rivers National Forest, and the Eel River Recovery Project. Other collaborators have included the Humboldt Redwood Company, the town of Scotia, the Van Duzen Guild, Barbara Domanchuk Media, the Sequoia Zoo, and the local and state parks: Pamplin Grove and Grizzly Creek where the students have witnessed salmon spawning and trillium flowering.

The Young Scientists: The Next Generation raises the levels of awareness for the environment by teaching science in the classroom and in the field. Selected students and whole classes work with a team of scientist to study the water quality, the river dynamics, and the rivers'

inhabitants including macroinvertebrates, amphibians, and salmon. A smaller team of young scientists work alongside our science staff to install and retrieve 20 temperature probes placed in key locations along the Van Duzen River.

"By going to active salmon spawning sites, taking part in scientific study, and deepening powers of observation and reflection through artwork and creative writing, the children form a lifelong bond of understanding the forest ecosystem. The complexity and beauty of the woods will stay with them and nurture their appreciation of the environment. Once the kids have been in the woods, the woods are in the kids." Sal Steinberg, Director Kids in the Woods.

The past Spring, FOVD was very active in the local community organizing trillium walks at Pamplin Grove Old Growth County Park, one of the most beautiful sights in all of Humboldt and the world. Sal

Conservation Partner Organizations at Work



Bridgeville School students at Pamplin Grove County Park. PHOTO BY FRIEDA SMITH

Steinberg conducted classroom lessons identifying plant specimens followed by field trip tours with guide and photographer Tony Westkamper. Kids in the Woods provided funding for grades 3 and 4, and Trees Foundation's Cereus Grant provided funding for Grades 1 and 2. Trillium were everywhere, and student scientists were assigned to count the flowering trillium with their teachers. Data varied depending on weather conditions like rain, but classes counted close to 1000 trillium. A wonderful time was had by all ages in the centuries old Redwoods!

FOVD organized a three-day Science Faire at the Carlotta Grange Hall celebrating the culmination of the Kids in the Woods grant and honoring Earth Day. In the main hall the Science Faire featured booths with the dynamic Kids in the Woods staff of scientists teaching about gems and minerals, shells, fossils, insects, and mapping while students gazed into microscopes investigating microorganisms, and watched underwater fish videos with Pat Higgins, of Eel River Recovery Project. The kitchen area became the Lizard Room as students moved through a guided lesson drawing iguanas with local artist Cat McAdams. Special thanks to Nancy Gilmore, owner of the Fortuna Pet Store, now at Strong

Station in the old Radio Shack building, for providing live lizards for the Lizard Room. Special thanks to Paul Trichilo, Tony Westkamper, Steve Cannata, Dr. Bill Shapeero, Jim Rizza, Barbara Domanchuk, and Les Pagel for running the other science stations. Thanks to the Trees Foundation and the guidance of Cullen Cramer, GIS analyst, for the beautiful 3x4 foot posters donated and decorating the walls, as well as the Salmon photos by Eric Stockwell.

Friends of the Van Duzen River is dedicated to preserving our magical, mysterious salmon run and to training the next group of young scientists.

🌲 For more information:
www.fovd.org

Mercury Guidelines for Eating Humboldt Bay Fish & Shellfish

Humboldt Baykeeper

By Jennifer Kalt, Executive Director

Fish consumption is the major route of mercury exposure in the United States, but there are many health benefits of eating fish that is low in mercury and other

contaminants. Fish is high in protein and low in fat, and is an important source of omega-3 fatty acids, which support heart health and brain functions. But until now, there has been little known about mercury levels in Humboldt Bay fish and shellfish.

All fish contains some mercury. At high levels, mercury exposure can lead to various health complications, including fatigue, muscle and joint pain, and memory loss. Children are especially susceptible to development-related effects such as decreases in learning abilities, language skills, attention, and memory function.

In 2012, the North Coast Regional Water Quality Control Board determined that Humboldt Bay did not warrant listing for mercury impairment under Clean Water Act Section 303(d) based on mussel testing done in the 1980s. However, that same year, a report was released showing that Leopard Shark from Humboldt Bay had the highest mercury levels in a statewide assessment of contaminants in coastal fish, indicating a need for further testing of commonly eaten fish caught in Humboldt Bay.

In 2016, Baykeeper was awarded a grant from the California Environmental Protection Agency to test local fish and shellfish. Working with fisheries consultant Ross Taylor, the Wiyot Tribe, and dozens of local anglers, we spent nearly two years catching Humboldt Bay fish to test and interviewing shore-based anglers.

Our results include both good news and bad news. In short, the best way to avoid mercury exposure while eating lots of healthy local fish is to eat small, short-lived species, since mercury accumulates in larger, older fish.

Salmon, oysters, and clams are very low in mercury. Dungeness crab and locally-caught albacore are relatively safe in moderation, but California halibut, lingcod

Guidelines For Women <45 And Children

Best Choices – Eat 5 To 7 Servings A Week

Wild Chinook Salmon
Oysters, Mussels, Clams

Anchovies
Sardines

Good Choices – Eat 2 To 3 Servings A Week

Dungeness Crab
Locally-caught albacore
Black Rockfish

Surfperch
Smelt

In Moderation – No More Than 1 Serving A Week

Lingcod under 10 pounds
California Halibut
Pacific Halibut under 40 pounds
Bat Ray

AVOID fish with the Highest Mercury Levels

Leopard Shark
Brown Smooth-hound Shark
Spiny Dogfish
Lingcod over 10 pounds
Pacific Halibut over 40 pounds
Cabezon
Copper, China, and Gopher Rockfish

California has two sets of mercury guidelines: 1) For women under 45 years of age and children, and 2) For women over 45 years of age and men.

under ten pounds, and Pacific halibut under forty pounds should be eaten less frequently. Sharks and some species of rockfish are long-lived predators that should be avoided entirely due to high mercury levels. Black rockfish, also known as black snapper, is a shorter-lived species that can be safely eaten more frequently.

Our results are especially important for people who eat more fish than the average American, including tribal members, sport and subsistence anglers, commercial fishermen, and anyone who tends to freeze, can, or smoke fish to eat year round, since they often consume many meals from one large animal.

Future studies will focus on lamprey eel, ocean-caught fish, and potential sources of the mercury in our environment. There are no known local sources of mercury in the Humboldt Bay area. Mercury was used in historic gold mining in the Klamath, Trinity, and Russian Rivers, but its use is not known from the Humboldt Bay area or in the Eel and Mad River watersheds.

The primary source of mercury in the U.S. is pollution from coal-burning power plants around the world. Mercury is emitted into the atmosphere wherever coal is burned and deposited across western North America, and a recent study found that coastal fog deposits mercury at higher levels than rainwater in Central California.

🌲 For the complete guidelines and results of mercury testing in Humboldt Bay fish and shellfish, and to download the printable guidelines and the full report, visit humboldtbykeeper.org.

The Klamath National Forest is “Salvage” Crazy

Klamath-Siskiyou Wildlands Center

By George Sexton, Conservation Director

In the mid-Klamath River watershed, timber planners on the Klamath National Forest, located in Siskiyou County in northern California, have a long history of using wildfire as an excuse to throw out the rulebook when targeting post-fire forests for logging. Like clockwork following every wildfire, the Klamath National Forest rolls out a proposal to clear-cut native, fire adapted forests. The good news is that the leadership in the surrounding National Forests is beginning to understand and embrace the crucial role that fire plays in maintaining the health and diversity of public forests in the Klamath-Siskiyou Mountains. Yet, the Klamath National Forest

Conservation Partner Organizations at Work

firmly believes that the proper response to wildfire is to build logging roads, slick off entire watersheds, and convert native forests into dense second-growth tree plantations.

Clearcutting Old-Growth Reserves

Following the summer 2017 Abney fire, timber planners on the Klamath immediately began to layout clear-cut logging units within the protected old-growth reserves through a timber sale called “Seiad-Horse.” According to forestry professor Dr. Jerry Franklin, who designed the forest reserve system, post-fire clearcutting is antithetical to the wildlife and watershed objectives that the reserves are intended to achieve. After logging the reserves, timber planners establish dense young timber plantations designed to maximize timber yield. As confirmed by recent studies, these tree plantations often increase fire hazard while providing little in the way of wildlife habitat that the reserves were designed to achieve.



A 365 year-old tree felled as part of the Klamath National Forest response to the Abney Fire. PHOTO BY KS WILD

A Parade of Horribles

In addition to targeting the old-growth reserves for logging, the Seiad-Horse timber sale is located in the Cook and Green Botanical Area, one of the most botanically diverse and important areas in California. The Forest Service hopes to log the Botanical Area as part of its effort to maintain an old backcountry-mining road that serves no purpose. Similarly, the timber sale proposes old growth logging within two Inventoried Roadless Areas, protected streamside buffers intended to protect aquatic watershed values, and adjacent to the Pacific Crest Trail. While locals are used to this “timber first,” the disregard for all forest values other than timber volume in the Seiad-Horse logging proposal is shocking.

A Regional Outlier

While the Klamath bulls ahead with its controversial plans, the surrounding National Forests have a more holistic approach to post-fire management. While the Rogue River-Siskiyou National Forest is also proposing salvage logging following the 2017 fire season, unlike the Klamath National Forest, they are not targeting old-growth reserves, roadless areas, botanical areas, or streamside buffers. Similarly, the Shasta-Trinity National Forest largely avoids locating post-fire salvage logging in forests that are intended to provide watershed and wildlife values. The Klamath National Forest is a regional outlier in utilizing fire in fire-evolved, and fire dependent forest ecosystems as an excuse to target supposedly protected forests for clearcutting and conversion into tree plantations.

Biting Off More Than They Can Chew

The excesses of the Klamath National Forest post-fire logging binge have not gone un-noticed. Conservation organizations, botanists, fishing advocates, fire managers, hikers, and birders have all weighed-in

against the extreme Forest Service logging proposal. Many are advocating for post-fire management that reflects the millennia of local knowledge and experience contained in the recommendations of the Karuk Department of Natural Resources. The Karuk management vision would return fire to the landscape through the timely use of prescribed fire while reducing fuels nearest to homes and communities. The tide is turning and KS Wild is proud to stand with the Environmental Protection Information Center and the Klamath Forest Alliance to protect the wild places and watersheds in the Klamath River Watershed.

🌲 For more information: www.kswild.org

A Community Effort: Invasive Pampas Grass on California's Lost Coast Lost Coast Interpretive Association

In the dunes, bluffs, and disturbed areas of California's Lost Coast ranges the large perennial pampas grass has become a common sight. Originating in Argentina, pampas grass was introduced in this area as an ornamental plant and for erosion control in logged redwood forests of Humboldt County. Over the past 50 years since its arrival, pampas has become highly invasive, competing with the native plants of the Lost Coast for space, sun, nutrients, and water. In conservation areas, pampas grass competes with seedling trees, reduces aesthetic and recreational value of the areas, and increases fire potential with its excessive buildup of dry leaves.

On the North Coast of California, seemingly lost between Fort Bragg and Petrolia, community members of the ocean-side village of Shelter Cove, partnering with government agencies and



Whale Gulch students work in a forest of Pampas.
PHOTO BY LCIA

Recovering a Lost Floodplain

Salmon Protection and Watershed Network

*By Preston Brown,
Watershed Conservation Director*

The Salmon Protection and Watershed Network (SPAWN) will soon undertake our most ambitious habitat restoration project in order to ensure coho salmon remain part of our ecosystem for generations to come.

The Lagunitas Creek Floodplain and Riparian Restoration Project is an effort to restore a one mile-long stretch of river habitat within the Golden Gate National Recreation Area. The project builds upon Turtle Island Restoration Network's (our parent organization) partnership with Point Reyes National Seashore to restore the once wild and dynamic alluvial valley of Lagunitas Creek. We're embarking on the restoration to recover a lost floodplain that has been buried under 20 feet of dirt dumped in the river corridor decades ago to build the villages of Tocaloma and Jewel.

The restoration will re-create the large dynamic floodplain with side channels, alcoves, and numerous large woody debris structures—all elements that coho salmon critically need. These habitats will create slow off-channel areas that are commonly seen in undeveloped pristine waterways that provide feeding and rearing grounds for fish and other wildlife, including California freshwater shrimp and California red-legged frog.

"This is one of the largest projects undertaken in the watershed," said Preston Brown, director of watershed conservation. "Our goal is to restore the natural functions, letting the stream behave how it wants to, not only to benefit salmon

non-profit organizations, are making a last stand against the spread of pampas grass onto the public lands of the King Range National Conservation Area and surrounding forest. Led by the Lost Coast Interpretive Association (LCIA) and the Shelter Cove Invasive Plant Project (SCIPP) is a collaborative partnership between the Bureau of Land Management, King Range Alliance, Shelter Cove Resort Improvement District, and local community groups and property owners. With seed monies granted by the Cereus Fund of the Trees Foundation, SCIPP partners have worked in collaboration to create a treatment plan to eradicate invasive pampas grass. The plan will roll out in several phases and over many years to come, focusing on community awareness and education, systematic eradication of pampas grass populations, and the on-going maintenance of treated areas.

Over the past year, SCIPP has led community volunteers, teachers, students, and property owners in Pampas removal projects near Black Sands Beach and in wetland areas near the coast. To celebrate Earth Day 2018, Shelter Cove volunteers removed nearly 35 cubic yards of pampas grass, and locals learned the importance

of eradication and removal techniques for use at their own properties.

SCIPP will continue eradication by hiring local contractors to remove the largest plants with excavators on public and private property. Public agencies have agreed to remove pampas grass on land they oversee, while private landowners will have an option to participate in a rebate program to assist with the means to remove large plants on their land. In addition, LCIA will provide native plants to replace the Pampas grass after its removal to discourage new sprouts.

The Cereus Fund has made it possible to plan and implement the first couple years of projects. Moving forward, continued community collaboration and SCIPP leadership is imperative for successful removal efforts and on-going maintenance. Many Shelter Cove property owners and local organizations have already reared their heads against this incredibly invasive species, and have proven they are ready for this challenge! Thank you Cereus!

🌲 For more information: www.lostcoast.org

Conservation Partner Organizations at Work



The demolition of dilapidated structures in the former village of Tocaloma along Lagunitas Creek begins. PHOTO BY SPAWN

but the entire ecosystem that relies on the dynamic nature of the creek,” he added.

Following the removal of numerous abandoned and dilapidated structures of the former villages, we began work completing engineering designs, permitting, and environmental compliance. The planning is complete and we will begin earthwork this August 2018. This restoration will provide immediate habitat for endangered wildlife and will provide vital services to improve water quality and flood control.

SPAWN has secured funding for the project from the California Department of Fish and Wildlife and the State Water Resources Control Board through competitive grants. Matching funds have been provided by generous donations from SPAWN members

and supporters. We are looking forward to engaging volunteers and members to help us in the process. Currently we’re collecting seeds and raising plants for the restoration and will begin planting this November.

For more information:
seaturtles.org/programs/salmon/

Large Wood Technical Field School on the Mendocino Coast

October 30 - 31, 2018

Salmonid Restoration Federation

Salmonid Restoration Federation and Trout Unlimited are partnering to host

a Large Wood Technical Field School on the Mendocino Coast for foresters, engineers, planners and restoration practitioners. Large wood installations also called large woody debris (LWD) or engineered log jams (ELJ) are restoration techniques to improve instream salmon habitat and streamflow. Creeks benefit from channel and pool complexity. The science and protocols of utilizing large wood are evolving so this intensive training presents a great opportunity to learn about a range of approaches.

This two-day field school will train forestry and restoration professionals in both engineered and non-engineered large wood augmentation techniques that have been proven effective in restoring stream habitats on the Northern California coast. Participants will learn how to effectively design and implement large wood restoration projects by learning how to identify geomorphic conditions of a treatment stream and select appropriate implementation methods to achieve desired results. Each day will include classroom lectures, hands-on activities, field demonstrations, project site tours, and ample group discussion.

Project tours will likely occur in the Ten Mile River, Big River, Pudding Creek, and Noyo River watersheds. Participants will



Panoramic of South Fork Ten Mile River Stream Habitat Enhancement Project in Mendocino County PHOTO BY LIBBY EARTHMAN, TROUT UNLIMITED

have the opportunity to observe on-site demonstrations of accelerated recruitment (direct falling) site construction. Field school contributors may also provide an on-site overview of heavy equipment implementation techniques and the process of anchoring large wood structures with hardware. Hands-on group activities may include buoyancy and other engineering computations and the construction of large wood site scenarios in the classroom. Additional discussion topics during the field school will include project site identification, project layout, and design considerations.

There will be presentations on:

- Accelerated large wood recruitment
- Selecting and sourcing trees
- Restoring wood's essential role in controlling channel grade and stability in small streams
- How to keep wood from floating downstream
- Instream large wood restoration techniques
- Collaborating with heavy equipment operators to implement large wood projects

🌲 To learn more about this educational event or to register, please visit www.calsalmon.org

21st Annual Coho Confab in the Smith River

August 24-26, 2018

Salmonid Restoration Federation

Salmonid Restoration Federation (SRF) is coordinating the 21st Annual Coho Confab that will take place August 24-26 in the pristine South Fork Smith River in Del Norte County. The Coho Confab is a field symposium to learn about watershed restoration and techniques to restore and recover coho salmon populations. The Confab provides an ideal opportunity to network with other



Aerial view of South Fork Smith River and Rock Creek Ranch, the beautiful location where the 21st Annual Coho Confab will take place. PHOTO BY THOMAS DUNKLIN

fish-centric people and to participate in field tours that highlight innovative salmon restoration practices. This year, SRF is collaborating with several groups to produce this educational event including Smith River Alliance, the Yurok Tribe Fisheries Program, and Fiori GeoSciences.

The Coho Confab will open Friday evening, August 24 with a community dinner and inspiring keynote presentations from geologist Michael Furniss who will give a presentation entitled, *Geology is Destiny, Why the Smith River is What it Is*. Pioneering engineer and heavy equipment operator, Rocco Fiori, will discuss habitat restoration in dynamic systems. Marisa Parish of Smith River Alliance will present *Scale, Biology, and Endurance: Using a Long-term Coho Salmon Monitoring Program to Advance Restoration Planning*.

Saturday will feature a full-day tour of stream and valley floor restoration in Lower Klamath tributaries that will be led by Rocco Fiori and Sarah Beesley of the Yurok Tribal Fisheries Program. Concurrent field tours on Saturday will include a fish passage toolbox tour led by Michael Love and Associates of fish crossing projects in various tributaries to the Smith that utilize various geomorphic and hydraulic approaches and solutions used in the California Stream Habitat Manual fish passage chapter. There

will also be an afternoon underwater fish identification workshop in the Lower Smith.

When participants return from a day of field tours, there will be a Research to Restoration Open Forum to discuss how coho monitoring can inform priority restoration activities. This forum will include Justin Garwood, the scientist who oversees the coho salmon monitoring program in the Smith River; Julie Weeder, SONCC Coho Salmon Recovery Coordinator with NOAA Fisheries; Darren Mierau, North Coast Director of CalTrout; and Patty McCleary of Smith River Alliance.

The Open Forum will be followed by evening festivities including a traditional salmon bake, campfire, and music with river troubadour, Joanne Rand.

The last day of the Confab will include two concurrent field tours including Design, Permitting and Monitoring of Beaver Dam Analogues in Lower Klamath tributaries led by the Yurok Tribal Fisheries Program. There will also be a collaborative tour that will include Large Woody Debris (LWD) projects led by Dan Burgess of California State Parks, future fish passage projects with the Tolowa Dee-ni' Nation and consulting engineer Travis James, and recently completed bridge projects by CalTrans.

🌲 For more information: www.calsalmon.org.

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A Coho Salmon in Lagunitas Creek
PHOTO BY CATIE CLUNE

**WHAT WOULD THE WORLD BE, ONCE BEREFT OF WET AND WILDNESS? LET THEM BE LEFT,
O LET THEM BE LEFT, WILDNESS AND WET. LONG LIVE THE WEEDS AND THE WILDERNESS YET.**

- GERALD MANLEY HOPKINS, 1844-1889

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