

Trinity County Resource Conservation District Winter 2022 ~ 23 Conservation Almanac

Trinity County Resource Conservation District Quarterly Newsletter

Winter 2022-23 Vol. XXXI No.4



In this issue:

- Celebrating Greg Lowden
- *Arundo donax* Removal
- Welcome New Staff: Annyssa & Duncan
- Meet the Grizzly Corp: Miles & Charlie
- Beaver Modeling for the Upper Trinity Watershed
- Fire Education in Local Classrooms
- Trinity River Restoration Program: Oregon Gulch Rehabilitation

The TCRCD staff organized many conservation themed community events this cold and blustery winter. Among notable highlights are the Wild and Scenic Film Festival and the 14th Annual Trinity County Plant & Seed Exchange. Through valuable partnerships with local agencies, nonprofits, and businesses, we are working to create a lasting impact in our community. Stay informed about upcoming events, including the eagerly awaited Salmon Festival and the monthly Science On Tap gatherings.



Celebrating Greg Lowden

Contributed by Pat Frost

I am honored to have been asked to help celebrate the long and distinguished service of Greg Lowden on the Board of Directors of the Trinity County RCD. Greg was the Chairman of the Board when I joined the District in January 1999. He served in that leadership role a number of times to help guide the District as it grew and expanded its services to the people of Trinity County.

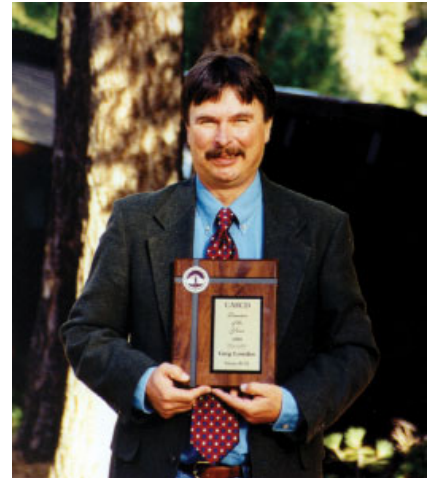
Gregory Lowden has lived in Weaverville since 1967. He graduated from Trinity High School in 1969. After a tour of duty with the U.S. Army, he attended Shasta Junior College, graduating with an AA degree in history in 1974. He has been employed as a surveyor with Hunt Land Surveying, Inc. since 1978.

Greg has been dedicated to serving our community for decades. He served as a member of the Board of Directors of the Weaverville-Douglas City Parks and Recreation District from 1989 to 1995. He joined the Board of the RCD in 1992, serving 30 years. He also is a member of the Weaverville Lion's Club, having served as its president several times. Greg helped to establish the Weaverville Basin Trails Committee of the RCD and was Board Chair when the Committee completed its Weaverville Basin Trails Master Plan – the original blueprint for the basin's trail system.

When I think of Greg and the RCD I think of his passion for environmental education. He became involved in the California Envirothon State Steering Committee around 1994. The California Envirothon is a program designed to be a written and hands-on competition of high school students' knowledge of California's natural history. Greg also served as the chairman of the Canon National Envirothon in 1999, the year it was held at Humboldt State University and later as President of the California Envirothon Steering Committee.

Greg's work wasn't just recognized by his friends and colleagues here in Trinity County. He was the recipient of the Director of the Year award by the California Association of Conservation Districts in 1999 as well as a citation by the Canon National Envirothon that same year for his tireless work to bring the national competition to California that year.

Congratulations to Greg on his "retirement" from the Board of the Trinity County Resource Conservation District and thank you for your many years of volunteer service.



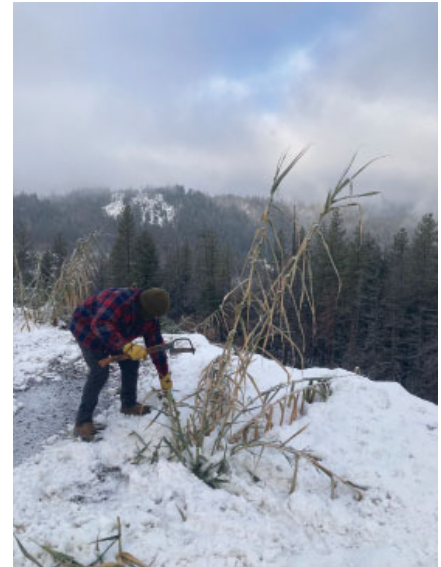
Arundo donax Removal

In December of 2022, Trinity County RCD Botany Program worked with the Trinity River Restoration Program to remove a population of *Arundo donax*. This was identified on Highway 299 in a state right-of-way near Poker Bar Road by riparian ecologists at TRRP. This population was discovered and brought to the attention of both partners this year.

Arundo donax, commonly known as “giant reed”, is considered a high priority noxious weed by California Invasive Plant Council (Cal-IPC). It is a very large (9-30’) clump-forming perennial grass with hollow stems, resembling bamboo. The plant reproduces from underground rhizomes and, unfortunately, plant fragments. This last feature is why it cannot simply be cut and discarded. Since this is the only known population of this species on public land in Trinity County, it is considered a high priority for eradication.

The team of six conservationists began by cutting the stalks down to expose root structures, and then they carefully bagged all of the stem fragments. The roots were then dug out and removed entirely. Finally, heavy-duty tarps were applied to solarize any potential remnants. The group hauled away an impressive 1,000 pounds in one day! Both partners have committed to following through with active implementation and will work together towards a goal of eventually eradicating this species from the watershed.

Early detection and rapid response (EDRR) is a crucial component of invasive species management, where “detection” is the process of observing and documenting an invasive species, and “response” is the process of reacting to the detection. If you see this plant anywhere in Trinity County, please do your part by calling TCRC Botany Program at (530) 623-6004 x212.



Welcome New Staff: Annyssa & Duncan

Annyssa Interrante

Watershed Project Coordinator Annyssa Interrante was born in rural North Texas on a 240-acre property with a herd of donkeys and an undeniable love of nature. Her passions led her to pursue a Bachelor's in Wildlife Biology and Conservation at the University of Alaska Fairbanks. She has completed multiple molecular genetics research projects including population genetics of Chinook Salmon and dietary analyses of Arctic Lamprey. She later held a job as the Assistant Director for a nature education summer camp at Creamer's Field Migratory Waterfowl Refuge, and worked for the National Ecological Observatory Network (NEON) project as a Technician and Lab Manager for Domain 18/19. Upon moving to Southeast Alaska, she worked for the National Park Service as a Botany Technician and published an Invasive Plant Identification guide for Klondike Gold Rush National Historical Park. She was working with an environmental consulting firm and the Bureau of Land Management conducting Assessment Inventory and Monitoring (AIM) rangeland surveys in southern Arizona and Wyoming when she found Trinity County Resource Conservation District.

She brings fresh enthusiasm to TCRCD and is excited to explore everything Trinity County has to offer. When asked how she likes it so far, she says, "I feel like I could live here for a lifetime and still never see it all".



Duncan McIntosh

Education and Outreach Project Coordinator Duncan McIntosh grew up assisting his family in homesteading and farming in Burnt Ranch. In the early 90s, his family was forced to leave their beloved mountain home due to the economic crash that followed the closing of the lumber mills across the county. After achieving a bachelor's degree in Business Administration from Cal Poly Humboldt, Duncan, his wife Lizzy, and their three children, Alex, Maya, and Emily, moved back to Trinity County nine years ago. With a passion for community building and sustainable economics, Duncan was a founding member of the

Trinity Farms for Compliance organization, which works as a policy advocate on a county and state level to usher in sustainable commercial cannabis regulations. In 2018 Duncan became the President of the North Fork Grange, an ambitious and energetic community-based organization in Junction City. He has worked diligently within the Grange to build a momentum of volunteering and engagement. In 2019, Duncan was appointed to the Trinity County Planning Commission and served until February 2023.

As an enthusiast of the natural world, Duncan is excited to work with the TCRCD in the education of watershed and natural resource management with all age groups!



Meet the Grizzley Corp: Miles & Charlie

The Trinity County Resource Conservation District is hosting GrizzlyCorps members, Miles Raymond and Charlie Curtin, through July 2023. GrizzlyCorps is an AmeriCorps program focused on furthering climate action and building capacity in farm and forest communities across California. Miles and Charlie are working on partnerships with public and private entities through the Trinity County Fire Safe Council and the Weaverville Community Forest. Much of their work centers around education and outreach, particularly in promoting wildfire safety with local landowners as well as fire ecology and safety lessons with children.

Miles Raymond

Miles grew up in Goleta, California. He recently graduated from Cal Poly San Luis Obispo where he received a B.S. in Forestry and Natural Resources and a minor in Geographic Information Systems there. At Cal Poly SLO, Miles was a part of the Real Food Collaborative which focused on bringing people together through homemade meals. During this time, he also worked at Yosemite Clean Energy, a start-up that focuses on creating hydrogen energy from biomass, where he tested his GIS skills and knowledge of natural resource management to help guide forest management decisions.

At the RCD Miles has been working on developing the Neighborhood Ambassadors program. This program aims to educate the community through volunteer outreach. In his free time, Miles enjoys surfing, backpacking, and cooking. Since moving here, he has spent his free time exploring the Trinity Alps and fishing in the Trinity River.



Charlie Curtin

Charlie grew up in Los Angeles, graduating last spring from the University of Southern California with a B.S. in GeoDesign and a minor in Environmental Studies. He spent his last year working on urban forestry with the City of Los Angeles, providing data-driven urban canopy recommendations and involving community members in workshops and tree planting workdays. This work sparked an interest in forestry and natural resources management, with Charlie choosing to head to Trinity County to explore these fields further. This year, Charlie has been working with the Trinity County Fire Safe Council to increase community wildfire preparedness through conducting home and neighborhood-level assessments, organizing community meetings, and renewing each community's Firewise Communities status. He is also working on organizing public events and workdays in the Weaverville Community Forest to increase public engagement. Since moving to Trinity County, Charlie has enjoyed the many uncrowded trails and river accesses.

GrizzlyCorps is a new AmeriCorps program launched in 2020 designed by Project Climate at UC Berkeley's Center for Law, Energy & the Environment in partnership with CaliforniaVolunteers. The program sends recent college graduates into rural communities across California to promote regenerative agri-food systems and fire and forest resilience.

Beaver Modeling for the Upper Trinity Watershed

Beavers and their activities supply a host of benefits to riparian ecosystems. Within North America, nearly every temperate ecosystem with stream corridors of shrubs and trees historically supported beaver dams (Castro et al. 1). Floodplain wetlands created by beaver dams are often sources of diverse stream conditions and riparian habitats that support birds, waterfowl, fish, aquatic invertebrates, amphibians, and mammals (Castro et al. 3, 5). Beaver dams increase areas of cold water refugia and high-quality diverse habitat for fish, reduce siltation and sedimentation in streams during high flows, detoxify agricultural runoffs, and overtime increase soil accumulation to restore incised streams (Castro et al. 8-11, Bouwes et al. 8). The increase of water storage time by beaver dams increases soil saturation and lateral spreading of water, decreases flammability of surrounding vegetation thus decreasing the severity of high-intensity wildfire burns in riparian corridors, and at large scales can elevate the water table and recharge aquifers (Castro et al. 4, 7, Fairfax and Whittle 1, 6). With increasing drought conditions and climate change, the benefits of beaver dams include increased dynamic floodplain connectivity, establishment of natural fire breaks, and higher habitat resiliency (Jordan and Fairfax 3-4). Accumulation of soils and debris collect carbon at high rates and beaver activities create diverse riparian canopy structures that are more productive and resilient while reducing water temperatures (Jordan and Fairfax 5-6, Wohl 3635).



Despite concerns that beaver dams pose a barrier to fish passage, it was found by Pollock et al. (2022) that 74% of juvenile steelhead and 91% of Coho salmon were able to move upstream past a beaver dam analog (BDA) within 3 days. In follow-up experiments, both species were capable of jumping over BDAs between 27-40cm tall, and swim upstream in side channels with slopes of 8-11%. While these values are far from regulatory measurements, it is proposed that the natural variations, decreased stream velocity, and shorter distances made the energy expenditures possible (Pollock et al. 17-18).

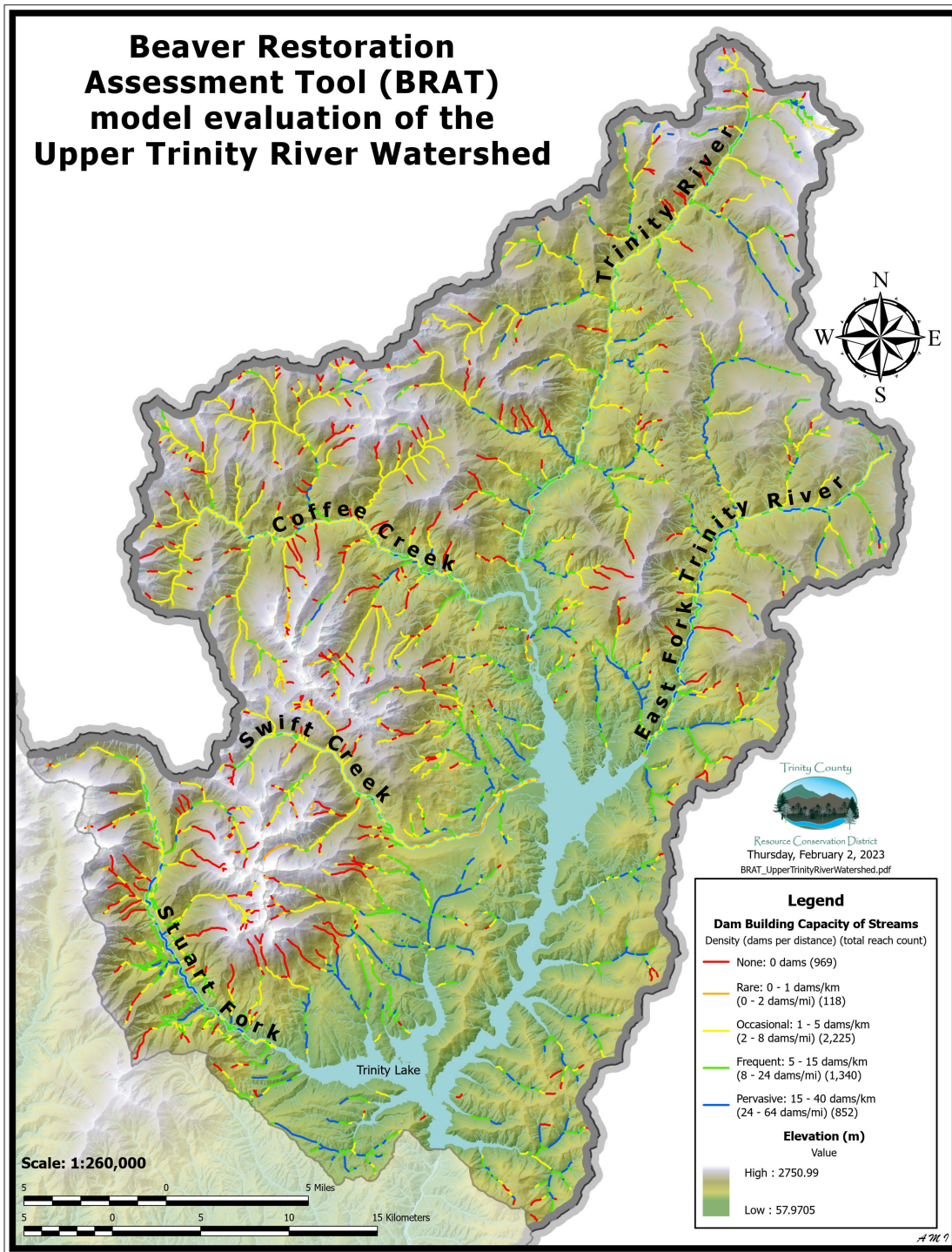
The Beaver Restoration Assessment Tool (BRAT, <http://brat.riverscapes.xyz/>) model was contracted by the Nature Conservancy with Utah State University in 2018 to assist in the planning of beaver-related projects in California. The BRAT Model 3.1.0 (Gilbert et al.) is an open-source Python script that analyzes the potential of the riverscape to support beaver dam-building activities and provides dam density estimates for stream reaches. The BRAT model is not a habitat suitability model, but rather a spatial assessment of streams and the surrounding landscape's capacity to support beavers.

The model assesses freely available datasets on the following parameters (Macfarlane et al. 11):

- Permanent water sources
- Vegetation within 30m of the stream suitable for foraging and dam building
- Vegetation within 100m of the stream to support expansion of dam complexes and maintain large beaver colonies
- The probability that dams could be built across the stream during low flows
- The probability that a beaver dam could withstand a flood
- Suitable stream gradients for beavers
- Exclusion of streams too large for beavers to build and dams to persist

The Beaver Restoration Assessment Tool (BRAT) model successfully identified over 948 miles in the Upper Trinity River Watershed that were deemed suitable for the dam building activities of beavers. It is estimated that the Upper Trinity River Watershed could support between 3,728 and 11,650 beaver dams.

Tools like the BRAT model help staff at the Trinity County RCD identify streams that have the potential for Beaver Dam Analog (BDA) installations or beaver relocation sites to help restore the health of streams and tributaries. High capacity streams are then visited by staff to assess needs and suitability for future restoration.



Bouwes, Nicolaas, Nicholas Weber, Chris E. Jordan, W. Carl Saunders, Ian A Tatlam, Carol Volk, Joseph M. Wheaton, and Michael M. Pollock. "Ecosystem experiment reveals benefits of natural and simulated beaver dams to a threatened population of steelhead (*Oncorhynchus mykiss*)". *Scientific Reports*, vol. 6, no. 28581, July 2016. dx.doi.org/10.1038/srep28581.

Castro, Janine, Michael Pollock, Christ Jordan, Gregory Lewallan, and Kent Woodruff. "The Beaver Restoration Guidebook: Working with Beaver to Restore Streams, Wetlands, and Floodplains Version 2.0". *U.S. Fish and Wildlife Service*, Portland, Oregon, 2017. www.fws.gov/oregonfwo/promo.cfm?id=177175812.

Fairfax, Emily and Andrew Whittle. "Smokey the Beaver: beaver-dammed riparian corridors stay green during wildfire throughout western USA". *Ecological Applications*, vol. 30, no. 8, December 2020. dx.doi.org/10.1002/eap.2225.

Gilbert, Jordan, Joe Wheaton, Wally Macfarlane, & Margaret Hallerud. "pyBRAT - Beaver Restoration Assessment Tool (Python) (3.1.0)". *Zenodo*. 2019. dx.doi.org/10.5281/zenodo.7086388.

Jordan, Chris E. and Emily Fairfax. "Beaver: The North American freshwater climate action plan". *WIREs WATER*, vol. 9, no. 4, ed. 1592, 2022. dx.doi.org/10.1002/wat2.1592.

Macfarlane, Wally, Sara Bangen, Maggie Hallerud, Braden Anderson, Chalesse Hafen, Micael Albonico, Chad Garlick, Tyler Gibby, Tyler Hatch, Cashe Rasmussen, Elijah Portugal, and Joe Wheaton. "California Beaver Restoration Assessment Tool: Building Realistic Expectations for Partnering with Beaver in Conservation and Restoration". Prepared for The Natural Conservancy, *Utah State University*. August 2019. dx.doi.org/10.13140/RG.2.2.20316.00644.

Pollock, Michael M., Shari Witmore, and Erich Yokel. "Field experiments to assess passage of juvenile salmonids across beaver dams during low flow conditions in a tributary to the Klamath River, California, USA". *PLoS ONE*, vol. 17, no. 5, 2022. dx.doi.org/10.1271/journal.pone.0268088.

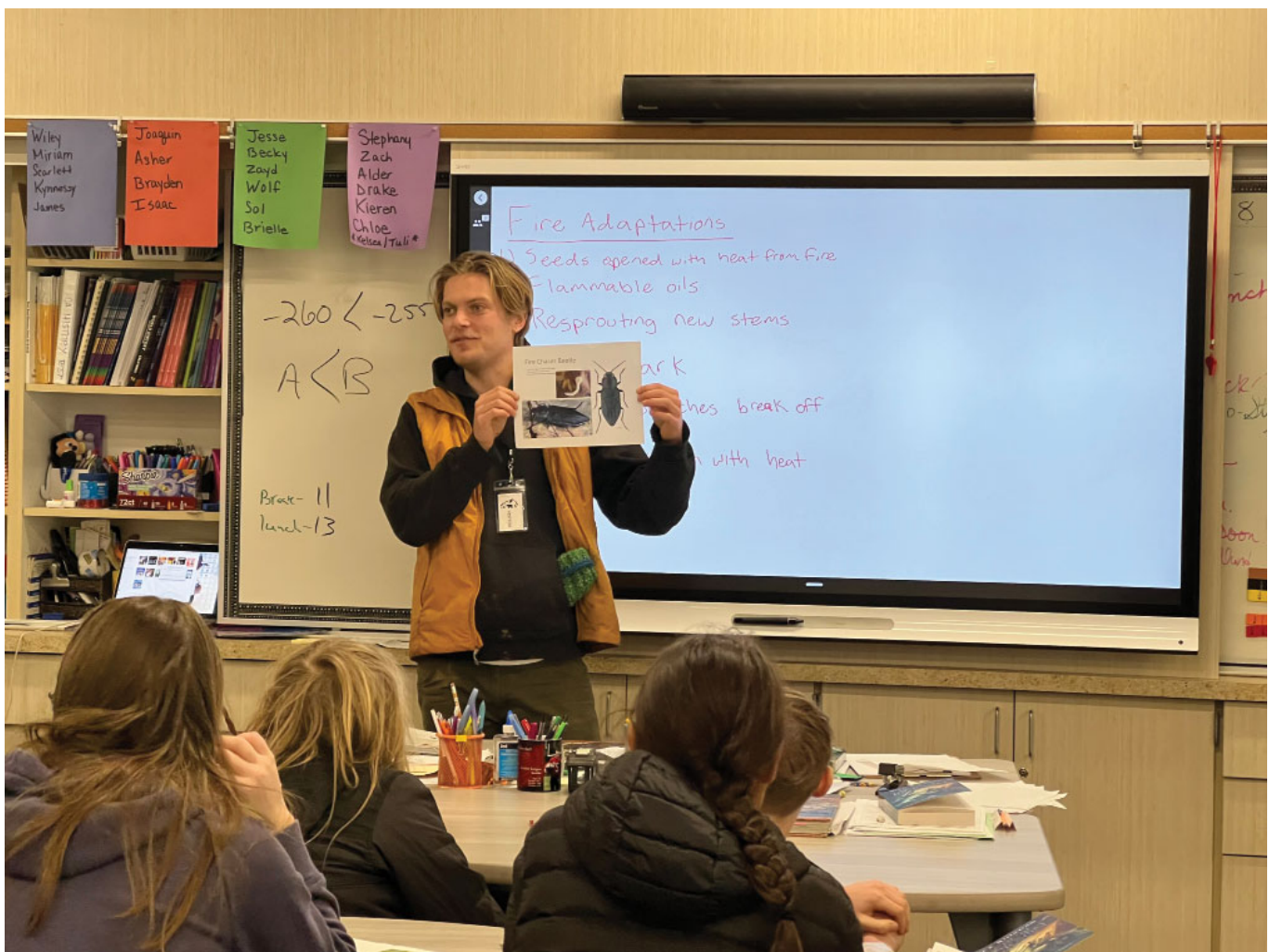
Wohl, Ellen. "landscape-scale carbon storage associated with beaver dams". *GEOPHYSICAL RESEARCH LETTERS*, vol. 40, July 2013, pp. 3631-3636. dx.doi.org/10.1002/gr1.50710.

Fire Education in Local Classrooms

Fire has played a role of great ecological and cultural significance in Trinity County. Historic fire regimes allowed for nutrient cycling and both habitat creation for plants and animals. Indigenous communities use fire to manage sources of food, culturally significant materials, fuels, and much more. In the early 20th century, a new philosophy of fire suppression was established, primarily by government agencies on a national level to prevent the destruction of valuable timber. This changed both the frequency and intensity of fires, as well as led to a gap in knowledge about the important role that fire plays in the ecosystem. With 100 years of absolute fire suppression as the strategy, the flammable fuels increased each year, as did the intensity and size of wildfires. Consequently, high-intensity wildfires have now become the greatest threat to our forest ecosystems and mountain communities.

According to the 2015 Trinity County Hazard Mitigation Plan, wildfires were the number one hazard concern for Trinity County Residents. The Trinity County RCD is interested in changing the way fire is used on the landscape and our relationship with it. One of the ways that we have been implementing this is through wildfire education lessons at middle schools across Trinity County. These lessons cover topics including fire behavior, management, ecology, and preparedness.

The primary goal of these lessons is to deepen youth's understanding of wildfire in our region: how and why fire exists in Trinity County, ecological adaptation and dependency upon the fire, proactive forest management, to defensible space, home hardening, and lastly, how to prepare for times of evacuation.



Charlie Curtin teaching about fire at Burnt Ranch Elementary School

Fire Education, cont.

We have found, through these lessons, that the children here in Trinity County are very aware of the wildfires, inherently understand many of these concepts, are quick to grasp new ideas, and are enthusiastic about learning. Through these four one-hour lessons and activities, we can break down broad concepts in a way the students can understand, and discuss with their parents.

One of the outcomes of these lessons is the opportunity to hold space for students to express their experiences and feelings about living in a place with a high prevalence of wildfires. The student's testimonies are often powerful, expressing relatives losing homes, smoke-induced asthma, frantic evacuations, staying with relatives, and more. Sharing these experiences with one another can be helpful to process these traumatic events in a constructive way.

So far, these lessons have been taught in the Weaverville, Junction City and Burnt Ranch Elementary Schools with over 90 students engaged. Trinity County RCD appreciates the teachers and administrators whom have partnered with us on this journey and looks forward to teaching this program throughout the County over the year



Duncan McIntosh and Charlie Curtin teach students about fire at Junction City Elementary School

Oregon Gulch Rehabilitation Site, Junction City, CA From Dunes of Stone to Flora and Fauna

By Elliot Sarnacki, Trinity River Restoration Program (TRRP)



"Dredging Scene." Near Weaverville, Calif. J.H. Eastman

Two miles upstream from Dutch Creek Bridge, nestled between Weaverville and Junction City, lies the Oregon Gulch Rehabilitation Site. Oregon Gulch was heavily impacted during historic gold mining and the use of large-scale hydraulic and dredging operations. What remains is 25-35ft high rock tailing piles that now occupy up to 75% of the Trinity River valley's width. These piles eliminate the capability of the water to flow into low-lying side channel topography as a natural system would during high flows, and instead constrains the river to a singular path. A momentous effort is currently underway to restore this important salmonid habitat on the scenic Trinity River.

In an effort to restore floodplain habitat for fish and wildlife, the Trinity River Restoration Program (TRRP) is removing the leftover piles of rock and transporting them out of the valley. With previous projects, excavated materials were placed closer to the valley walls which still limit river function. At the Oregon Gulch project site, recovered materials are transported to Eagle Rock, Inc. for processing into road products. The design calls for nearly 500,000 cubic yards of excavation which is enough material to fill 208 Olympic size swimming pools!

Why all the fuss though? Why not let mine tailing piles lie? The answer is found in the potential of what the valley could provide. The Junction City valley has the Trinity River's widest historic floodplain above the Hoopa Valley (not counting the floodplains now submerged below Trinity and Lewiston Lakes). The Oregon Gulch site is a portion of that valley with the least infrastructure constraints, giving it high potential to provide a large surface area of floodplain habitat for juvenile salmonids. When the standing piles of rock tailings are removed and the floodplain is restored, the site will be transformed into nursery habitat for juvenile salmon to feed, grow, and rest in.

Phase 1:

Since early August 2022, crews from Yurok Tribe, Hoopa Valley Tribe and several sub-contractors have been steadily working to bring Phase 1 of the design to completion. Upwards of 130 semi-truck loads of tailings are leaving the site per day, 5 days a week! Not only is stone being removed, but it is also being screened and sorted to create building materials and sort rock that can be used in other reaches of the Trinity River to improve fish spawning habitats. The removal crews have been working hard during favorable weather conditions and are expected to complete Phase 1 in late spring of 2023. TRRP is continually appreciative of residents who continue to support the Oregon Gulch project while tolerating increased traffic on local roads and other construction impacts. We strive for complete transparency and our door is open to anyone who would like to learn more, ask questions, or voice a concern.



Drone footage captures an aerial view of the 2022 augmentation site, Oregon Gulch. (Aaron Martin, YTFD)

The Oregon Gulch design team used fish capacity models to inform the design of the restoration project. The final design optimizes the site for variables including flow velocity, water depth and the availability of cover for fish. Models predict a 114% increase in the project's ability to hold fry at a 350 cubic foot per second (CFS) flow, and a 1,040% increase at 800cfs! This process-based restoration approach encourages the river to naturalize in the newly accessible floodplain and meander as it pleases. As a result, the fish capacity will change as the site evolves, and the benefits of the newly formed floodplain habitat are expected to persist and contribute to further diversity and resiliency.

Current cover and planned revegetation efforts are extensively studied by TRRP's riparian ecologists to improve future fish habitat. There are lots of considerations when planning for vegetation at a site, and TRRP asks extensive questions such as:

- "How often will a low-lying area be filled with water?"
- "At what distances are selected plant species most successful in relation to the water surface?"
- "Can the selected plants species survive variable water levels?"
- "What type of plants already exist within the site?"
- "What can be planted to enhance the species and structural diversity of the site?"

Revegetation of the floodplain and surrounding area will be critical in providing the cover that salmonid fry and smolts will need to protect themselves from predation, and help in providing a diverse habitat for other terrestrial and aquatic creatures to thrive.

Phase 2:

The second phase of the Oregon Gulch project will commence in-stream work that will help create a new river meander and lower the elevation of certain areas to increase connectivity to the new floodplain. Overall, the project proposes to create up to 1,000 times the amount of juvenile rearing habitat for small salmon at the site. This large-scale addition of nursery habitat will help increase the size and number of young salmon and steelhead that leave Trinity River on their way to the ocean, and will help promote an increase in returning adult salmon. These are just the most visible portions of the work being done, but numerous engineers, project partners and employees are busy measuring, designing, problem solving, and studying the site all in order to restore this site back to its former potential.

Trinity County RCD
P.O. Box 1450
Weaverville, CA 96093

Trinity County RCD Board Meetings

Third Wednesday
5:30 PM
Open to the Public

Trinity County RCD Office

30 Horseshoe Lane
PO Box 1450
Weaverville, CA 96093

Telephone

(530) 623-6004
FAX 623-6006

E-mail: info@tcrccd.net

Internet: www.tcrccd.net

The Trinity County RCD of Directors
John Ritz, Mary Ellen Grigsby, Josh Brown,
Kent Collard, and Mike Rourke.

Kelly Sheen, District Manager

Management Staff
Marla Walters - Grants Manager
Joan Caldwell - Fiscal Manager
Rebekah Wolfinbarger - Office Manager
Jessica Tye - Administrative Assistant
Amelia Fleitz - Watershed Program Manager
Skylar Fisher - Fire Safe Council Coordinator
Duncan McIntosh - Education and Outreach Project Coordinator
Annyssa Interrante - Watershed Project Coordinator
Jacob Johnson - Conservation Planner
Kayla Meyer - Conservation Planner
Duncan McIntosh - Education and Outreach Project Coordinator
Denise Wesley - GIS Manager
Erik Flickwir - Systems Administrator, Mechanic, & Graphic Design
Cynthia Tarwater - Road-related Sediment Reduction Program Manager
Bethany Llewellyn - Forest Health Program Manager
Dave Johnson - Forest Health Project Coordinator
Annie Barbeau - Revegetation Program Manager
Kaety Howard - Revegetation Project Coordinator

The Trinity County Resource Conservation District (TCRCD) is a special district set up under state law to carry out conservation work and education. It is a not-for-profit, self-governing district led by a volunteer board of directors.

The Trinity County RCD Vision

The Trinity County RCD envisions a balance between utilization and conservation of our natural resources. Through economic diversity and ecosystem management our communities will achieve and sustain a quality environment and healthy economy.

Fuels & Forestry Crew
Jeff McGrew - Fuels Crew Supervisor
Jeff Eads - Fuels Crew Supervisor
Danny Wells - Fuels Crew Supervisor
Mike Dunlap
Josh Scott
Kirk Wolfinbarger
James Marzolla
Garett Chapman
Jeff Heinig
Joshua Lee
Larry Jimenez
John Dickerson
Joey Moore
Jeremiah Weiss
Jonathan Bostrom
Thomas Paulson
Daphne Hobbs

Botany Crew
Maryann Perdue
Arvel Reeves
Jack McGlynn
Tina Wickerhaad
Tyler McKinley

GrizzlyCorps Fellows
Miles Raymond
Charlie Curtin



This institution is an equal opportunity provider in accordance with Federal Law and U.S. Department of Agriculture policy, this institution is prohibited from discriminating on the basis of race, color, national origin, gender, age, or disability.

