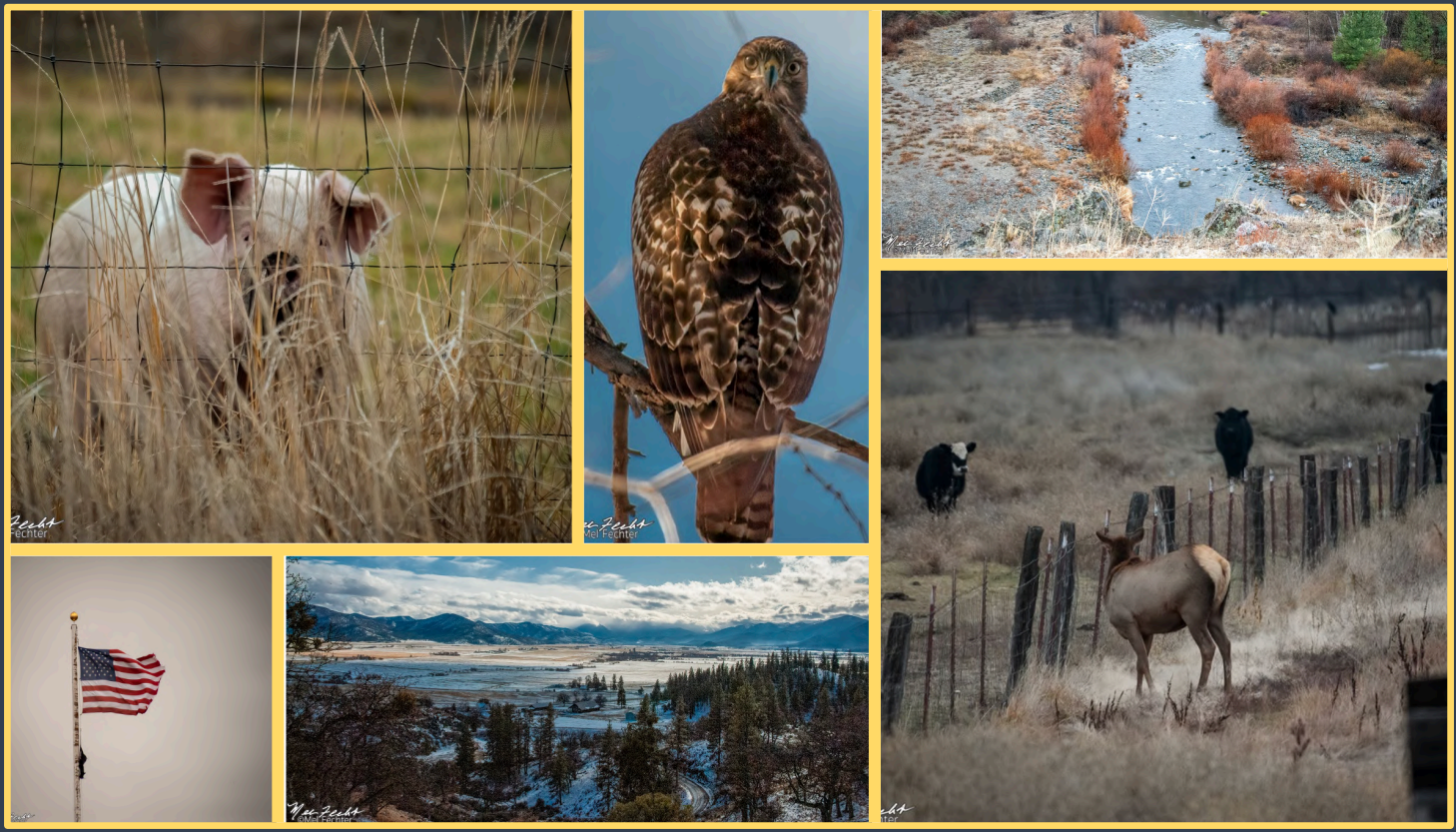
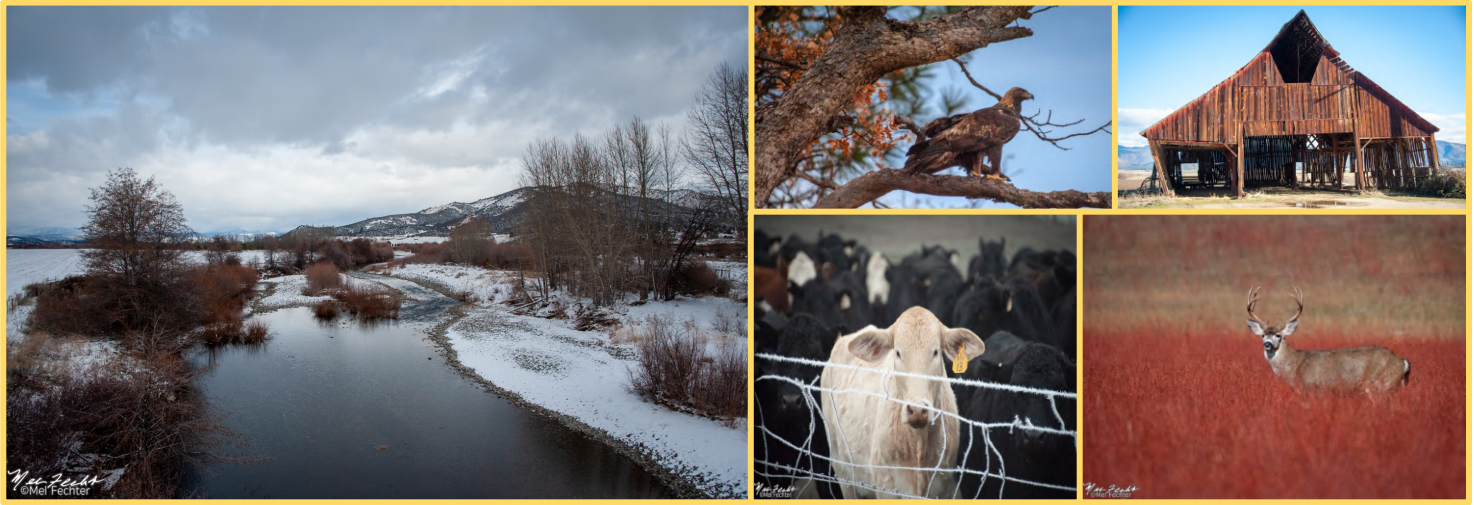
Scott River
Watershed Council



Scott Watershed Informational Forum & Legacy Mining Impacts and Restoration Summit

2022



Scott River Watershed Council is proud to host the annual
Scott Watershed Informational Forum (SWIF).

This year we are also excited and honored to co-host with the Yurok Tribe the
Legacy Mining Impacts and Restoration Summit.

This is an opportunity for our community to hear a wide variety of local, regional and national experts address topics affecting our local ecosystem and economy. Scott Valley can feel isolated and protected from the larger world, but these complex and challenging times do not leave us unaffected.

Fostering a collective understanding about the issues facing our watershed and greater Klamath River basin remains of the upmost importance, as our river and ecosystem connects us all into one larger community.

This event is focused on the various local efforts underway throughout the watershed and region which can provide climate change resiliency in our changing times not only for our local landscape, people and rich biodiverse species, but also for species that move across many regions.

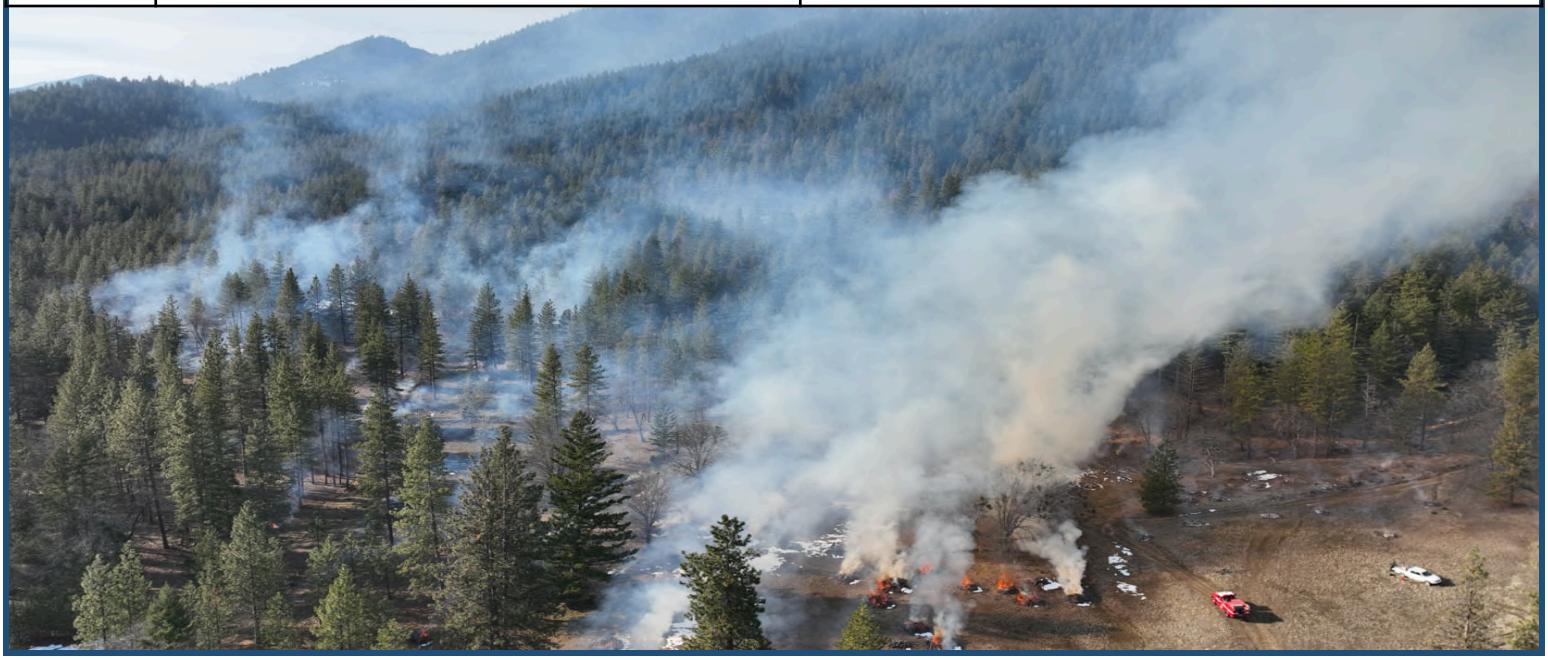
We would like to give a special thanks to Judd Hanna, Scott Valley rancher and community member, for his service as moderator on the Scott Watershed Informational Forum.

We would also like to give thanks to Mike Belchik, Senior Water Policy Analyst for the Yurok Tribe, who will service as the moderate for Legacy Mining Impacts and Restoration Summit.

The amazing photos featured throughout the event's program were taken by
our very own and talented Mel Fechter.

We would also like to thank the community member who have donated and who find this an invaluable opportunity for our community.

Thursday, February 17, 2022 - SWIF Presentation Day - Avery Theater, Downtown Etna		
Time	Presenter	Title
8:30am	Check in & Order Lunch	
9:00am	Judd Hanna, Hanna Brothers Ranch	Welcome & Event Details
9:05am	Russell (Buster) Attebery, Tribal Chairman of the Karuk Tribe	Opening Commentary
9:20am	Caden Gallagher, recent graduate, Environmental Science & Policy, Southern Oregon University	Cross-Sectional Generational Comparison of Restoration Perceptions in the Scott River Watershed, California
9:35am	Miles Munding-Becker, graduate student at Humboldt State University in the Environmental Systems	Storage Dynamics of Miners Creek: a conversation on Watersheds and Beaver Dam Analogues
9:50am	Chris O'Keefe, graduate, Master's program at the Department of Fisheries Biology at Humboldt State University	Do Beaver Dam Analogues Act as Passage Barriers to Juvenile Coho Salmon and Steelhead Trout
10:10am	David Coffman, PG, Resource Environmental Solutions (RES)	Restoration Elements of the Klamath River Renewal Project
10:30am	Break	
10:45am	Brandi Goss, Master's Student, UC Davis	How do BDAs change stream food webs: what stable isotopes can teach us about food webs in beaver dam analogs
11:15am	Emily Fairfax, PhD., Assistant Professor, Environmental Science and Resource Management at California State University Channel Islands	Smokey the Beaver: how do beaver dams keep riparian corridors green during wildfire?
11:45am	Lunch	
12:30pm	Maddy Rifka, fish/restoration scientist, Bureau of Land Management and a wildlife biologist for the BBC Natural History Unit	Trespass cannabis cultivation in Northern California
1:00pm	Len Nielson, Prescribed Fire & Environmental Protection Staff Chief, CAL FIRE	RX Fire for Private Landowners in California
1:30pm	Eric Knapp, PhD, Research Ecologist, USFS Pacific Southwest Research Station	Forest management and why it matters: Lessons learned from recent droughts and wildfires
2:00pm	Break	
2:15pm	Eli Asarian, Riverbend Sciences	Seasonal Effects of River Flow on Water Temperatures in the Scott River
2:45pm	Joe Croteau is CDFW's Klamath Watershed Program Manager	CDFW actions to ensure survival of Coho and Chinook Salmon in the Scott River watershed during the 2021 drought emergency
3:15pm	Betsy Stapleton, Project & Permit Development and Erich Yokel, Monitoring Supervisor, SRWC	Scott River Watershed Restoration: A Fish Tale
4:00pm	Larry Lestelle, Biostream Environmental	Assessment of Scott River Salmon Performance Under Historical, Current, and Restoration Scenarios
4:45pm	Gareth Plank, Rancher, Scott River Ranch	Ranching in Paradise
5:00pm	Adjournment	







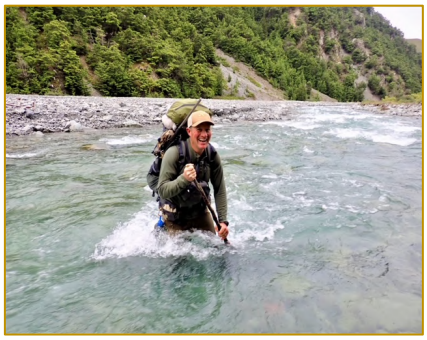




Scott Watershed Informational Forum (SWIF) Moderator

Judd Hanna

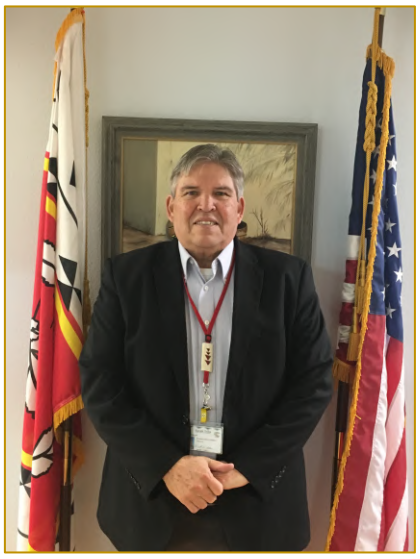
Judd grew up across the road from the house he lived in now, went to college, married his sweetheart — the amazing Regina — and have 2 great kids (Dylan, 14, Grady, 12). He works on Hanna Bros. Ranch with his brothers, uncle, and nephew and help his wife with a small Belted Galloway herd. Judd is on the Board of Directors for both the Scott River Watershed Council and the Siskiyou Golden Fair.



SWIF Opening Commentary

Russell (Buster) Attebery, Tribal Chairman of Karuk Tribe

Chairman Attebery has been the Chairman for the Karuk Tribe since 2011. He has been very active with the youth, serving as a teacher, coach and baseball official for many years. Chairman Attebery accepted the invitation to open the SWIF to share the cultural importance of the Scott River to the Indigenous people of Karuk Tribe.



Cross-Sectional Generational Comparison of Restoration Perceptions in the Scott River Watershed, California

Caden Gallagher, Graduate, Environmental Science & Policy, Southern Oregon University

Changes in the local climate of Scott Valley, California require the attention of government entities, the community, and landowners to adapt and respond to current and projected hydrologic system disruptions. Landowners along the Scott River and its major tributaries were identified and surveys regarding views on restoration and socioecological worldviews were administered and collected to better understand the perceptions of local landowners within the Scott River Watershed. An identical survey was administered and collected from local high school students, as they are likely to be future landowners in the Scott River Watershed. From the results of the survey, the responses from the two groups were compared.

Caden Gallagher graduated from Southern Oregon University in 2021 with a Bachelor of Science in Environmental Science and Policy and certificates in Sustainable Tourism and Sustainability Leadership. Growing up in Northern California and spending weekends and summers in the Sierra Nevada Mountains drove his passion to better understand the connections between resource management and land conservation. Challenges in managing and planning for water scarcity and resilience in water-scarce environments define his personal interests in studying human relationships to land. Caden holds a personal belief that engaging in the discourse regarding our relationship with land can create an opportunity to reframe our understanding of our place in the world and to live within the boundaries of the ever-changing biosphere.

Storage Dynamics of Miners Creek: a conversation on Watersheds and Beaver Dam Analogues

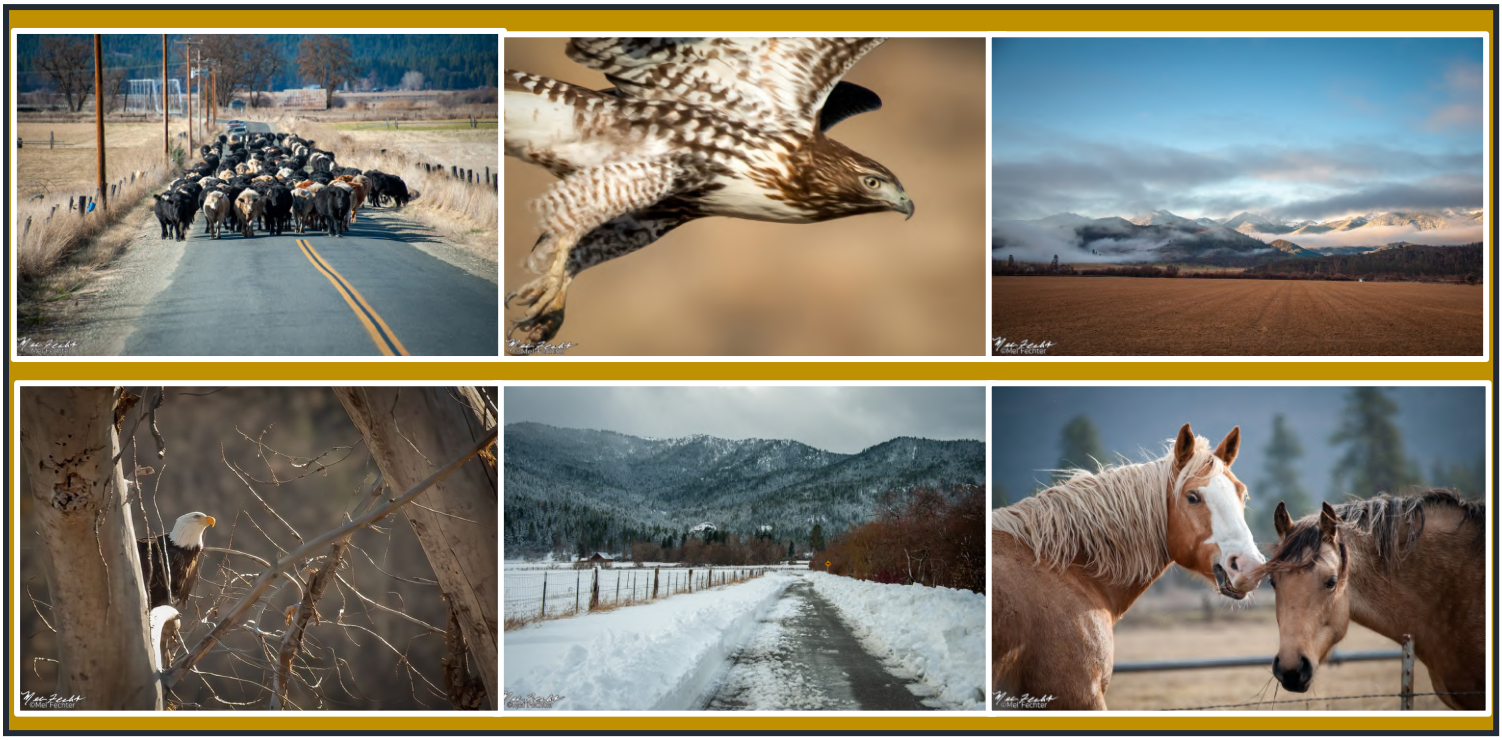
Miles Munding-Becker, graduate student at Humboldt State University in the Environmental Systems

Miners Creek is a small tributary to French Creek that drains from a ~20km^2 watershed. Historically, Miners Creek provided critical habitat to endangered Coho salmon (*Oncorhynchus kisutch*). In recent years, however, the system has become disconnected, requiring Coho to move either up or downstream. Since 2015, restoration began on a 500m stretch of Miners Creek via the installation of two Beaver Dam Analogues (BDAs). The BDAs provide habitat through water impounded behind their dams. Additionally, they can locally raise the water table thus increasing groundwater storage. BDAs have been heralded as a key tool in reducing channel aggradation and reconnecting rivers with their floodplain. In 2017, the system was enhanced and now is outfitted with four BDAs.

Mile's research utilizes upstream and downstream discharge data and a network of shallow ground water wells to quantify reach and watershed scale storage dynamics. The goal is to use these methods to explore the contributions that BDAs have in storing water. There are complexities to the success of BDAs. Limitations exist in water limited environments where discharge is not sufficient to sustain stream connectivity or BDA ponding. Preliminary results indicate that the thresholds required to produce runoff are not met in water scarce years (Water Year 2021). BDA pond water retention decreases rapidly in dry years and neither groundwater or BDA storage sustains baseflow through the dry summer months (May-September).

This presentation describes the implications of these results, the importance of scale in restoration, and ways to enhance water storage in dry water years.

Miles Munding-Becker, graduate student at Humboldt State University in the Environmental Systems program. I have spent the past year and a half learning about hydrogeology, fluid mechanics, fluvial processes, geospatial programs, and geomorphology. I have been refining the tools I've learned through coursework to examine the efficacy of restoration methods such as Beaver Dam Analogues. Outside of academia I have learned about the monitoring and maintenance of restoration projects through my employment at the Scott River Watershed Council. I am grateful to all my collaborators that have taught me so much through this graduate school experience. I look forward to sharing some of what I have learned with you.







Do Beaver Dam Analogues Act As Passage Barriers to Juvenile Coho Salmon and Steelhead Trout

Chris O'Keefe, graduate, Master's program at the Department of Fisheries Biology at Humboldt State University

In the Pacific Northwest, the human-caused reduction of quality and quantity of freshwater rearing habitat is a limiting factor for Pacific Salmon populations. Beaver dam analogues (BDAs) increase suitable rearing habitat for juvenile salmonids and promote the restoration of critical stream processes. Installing BDAs is an increasingly popular alternative to more intensive restoration techniques, due to the relatively low cost and effort required to install BDA structures. However, the widespread installation of BDAs has been slowed by regulatory agencies' concerns that BDAs may impede fish passage. Few studies have empirically assessed the extent to which BDAs impede fish passage, and no studies have elucidated physical factors (e.g., jump height, pool depth, water velocity, etc.) that affect passage. This knowledge gap in the scientific literature warrants further investigation to discern the suitability of BDAs for future restoration and/or to improve suitable fish passage conditions. Accordingly, I quantified the ability of Coho Salmon (Oncorhynchus kisutch) and steelhead trout (O. mykiss) to bypass beaver dam structures by conducting field experiments on existing BDAs and controlled hatchery experiments.

Chris O'Keefe recently finished the Master's program in the Department of Fisheries Biology at Humboldt State University. As part of his research, Chris worked with his advisor, Dr. Darren Ward, and the Scott River Watershed Council to assess the ability of juvenile salmonids to pass BDAs. He currently works as a fish biologist with the Pacific States Marine Fisheries Commission where he is partnering with NOAA and TU to prioritize restoration projects on the Klamath River from Iron Gate Dam to Link River Dam. Chris hopes to find a career that focuses on fisheries restoration and conservation in the Pacific Northwest. He likes spending his free time with his dog Skwala, fishing for steelhead on coastal-redwood streams, and playing guitar with his indie-rock band.

Restoration Elements of the Klamath River Renewal Project

David Coffman, PG, Resource Environmental Solutions (RES)

Removal of four hydropower dams (Iron Gate, Copco Nos. 1 & 2, and J.C. Boyle) on the Klamath River in northern California and southern Oregon represents the largest dam removal and river restoration project in the country. The project will restore free-flowing conditions and volitional fish passage to more than 400 miles of currently cut-off anadromous fish habitat upstream of the lower-most dam, Iron Gate. RES was selected by the Klamath River Renewal Corporation to lead restoration for this ambitious effort, as well as accept liability associated with ensuring restoration meets ecological and biological performance standards and long-term goals/objectives. RES is leading design efforts for the restoration of nearly four miles of priority tributary streams and associated fish habitat, as well as vegetation restoration for approximately 2,000 acres of previously inundated lands. Restoring volitional fish passage to hundreds of miles of the Klamath River, once the third largest producer of salmon on the West Coast, will be an important achievement for this large, complex project. Area Tribes have relied on salmon as a vital resource for generations; rehabilitation of salmon and steelhead populations is not only environmentally important but critical to sustaining their culture. RES will rely on native seed propagation for revegetation of upland, riparian, and wetland habitats, and large wood placement to stabilize sediments and improve habitat for native fish and increase river and tributary functionality. This presentation provides a general overview of the project, restoration goals and approach, and key elements of stream, riparian, and wetland restoration.

How do BDAs change stream food webs: what stable isotopes can teach us about food webs in beaver dam analogs.

Brandi Goss, Master's Student, UC Davis

Several Beaver Dam Analogs (BDAs) have been installed in the Scott Valley over the last decade. Natural beaver dams provide important habitat diversity that has been shown to enhance prey for foraging fishes. However, currently there are no studies that examine how food webs and trophic pathways to higher order consumers, such as coho salmon, shift with the construction of BDAs. As such, we are using naturally occurring stable isotopes (^{13}C and ^{15}N) to compare food webs between BDA and traditional stream habitat. We collected and analyzed numerous food web constituents in BDA and traditional stream habitat on Sugar Creek and reconstructed those food webs to better understand changes in trophic pathways to juvenile coho salmon. Additionally, we are beginning to test the use of ^{34}S stable isotopes to trace BDA habitat use by juvenile coho salmon.

Brandi is a Master's student with Dr. Robert Lusardi at UC Davis. She is interested in understanding ecological concepts and working closely with local communities to apply them to real-world conservation problems. Brandi moved to California in 2017 for an Americorps position with the Watershed Stewards Program which focuses on salmon conservation in California. In this position, she supported adult and juvenile salmon monitoring efforts on several tributaries to the upper Klamath River, including the Scott River. Through this experience, Brandi developed a passion for aquatic conservation because she saw that healthy rivers support healthy communities, both animal and human. Her Master's work is a partnership with the Scott River Watershed Council and focuses on understanding the conservation implications of beaver dam analogs for Coho salmon.

Smokey the Beaver: how do beaver dams keep riparian corridors green during wildfire?

Emily Fairfax, PhD., Assistant Professor, Environmental Science and Resource Management at California State University Channel Islands

Beaver dams and beaver mimicry (e.g., Beaver Dam Analogs) are gaining popularity as a low-tech, low-cost strategy to build climate resiliency at the landscape scale. Beavers slow and store water in their ponds, canals, and the surrounding soil during wet periods. Then during dry periods, the stored water stays accessible to plant roots, effectively "irrigating" the riparian zone. As a result, beaver-dammed riparian corridors are less flammable than drought-stressed vegetation nearby. My research has shown that these beaver-influenced patches of the landscape stay green and can serve as fire refugia, preserving intact, mature riparian habitat, even during megafires. Perhaps instead of relying solely on human engineering and management to create and maintain fire-resistant landscape patches, we could benefit from partnering with beaver's ecosystem engineering to achieve the same goals at a lower cost.

Emily Fairfax is an Assistant Professor of Environmental Science and Resource Management at California State University Channel Islands. Dr. Fairfax double majored in Chemistry and Physics as an undergraduate at Carleton College, then went on to earn a PhD in Geological Sciences from the University of Colorado Boulder. She uses a combination of remote sensing and field work to understand how beaver activity can create drought and fire-resistant patches in the landscape under a changing climate. Her colleagues and students can vouch that when Dr. Fairfax says she can talk about beavers all day, she's not kidding.

Trespass cannabis cultivation in Northern California and screening of film This Land

Maddy Rifka, fish/restoration scientist, Bureau of Land Management and a wildlife biologist for the BBC Natural History Unit

Illegal cannabis cultivation on public lands has emerged as a pervasive threat to Northern Californian ecosystems. Trespass grow sites have a marked impact on wildlife populations due to the habitat degradation, water pollution/diversion, and extensive use of toxic pesticides associated with their presence. This presentation will provide a brief overview of current knowledge of the environmental impacts of trespass cannabis cultivation, followed by a screening of the film This Land.

This Land looks at trespass cannabis cultivation through the eyes of Greta Wengert and Mourad Gabriel, co-directors of the Integral Ecology Research Center (IERC), and a husband-wife team on the front lines of the fight against trespass grows. The film journeys alongside IERC and law enforcement agents as they work to restore public lands that have been ravaged by illegal growers and return them to the wildlife from which they have been stolen.

Maddy Rifka works as a fish/restoration scientist for the Bureau of Land Management and a wildlife biologist for the BBC Natural History Unit. After growing up in British Columbia, the east coast of the US, and the southwest coast of England, Maddy now lives in Humboldt County. She spends her time hiking, canoeing, and snorkeling the rivers of Northern California to conserve Pacific salmon populations. Maddy is also a conservation filmmaker and photographer and focuses her storytelling on human-wildlife relationships. She has documented river restoration, fish migration, and the environmental impacts of illegal cannabis cultivation. Maddy has worked for outlets such as National Geographic and the BBC. Her work has been shown at the International Wildlife Film Festival 2020 and the Wildlife Conservation Film Festival 2021. Above all else, she wants to give a voice to those that need it and tell wildlife stories that inspire change.

RX Fire for Private Landowners in California

Len Nielson, Prescribed Fire & Environmental Protection Staff Chief, CAL FIRE

The presentation will cover the process that CAL FIRE goes through to initiate a prescribed burn for a landowner through various programs and processes. An overview of the Vegetation Management Process. Demonstrating how that process fits within the CEQA requirements and regulations. This presentation will address current limitations and opportunities locally to these CALFIRE led programs. An overview of the new online Burn Permit process from CAL FIRE and the Prescribe Fire IC and Burn Boss qualification process for CAL FIRE staff and private landowners and how does someone get started in a pathway for a successful prescribed burn. Additionally, CALFIRE strategies for increasing the scope and scale of prescribed fire will be discussed.

Len Nielson is currently the Prescribed Fire and Environmental Protection Staff Chief for CAL FIRE. The Programs that he oversees include the CAL FIRE Prescribed Fire, Cultural Resources, VMP, and VTP programs. He is on several cadres for the advancement of prescribed fire to increase the pace and scale to reach a goal of 1,000,000 acres of fuel reduction by the year 2025. Such as the Strategic Plan for Prescribed Fire, Cultural Burning , and Beneficial Fire as part of the Governor's Task force. He has been working in the woods since 1995. Graduated from Humboldt State with a BS in Forestry, part of his professional experience comes from working in a saw mill, timber cruising, site preparation (including prescribed fire), timber harvest plan layout and submittal in private forestry. For the last 17 years he has been a CAL FIRE Forester working in Mendocino, Humboldt, Madera, Fresno Southern Region, and Sacramento headquarter locations in various positions in Regulation Forestry, Vegetation Management, and Prescribed Fire.

Forest management and why it matters: Lessons learned from recent droughts and wildfires

Eric Knapp, PhD, Research Ecologist, USFS Pacific Southwest Research Station

Many forested areas in California have undergone dramatic changes over the last century. Some of those changes are the result of past management – for example, the removal of many of the largest, most fire-resistant trees. Other changes are due to suppressing the historical role of fire, which allowed forests to become denser, more homogenous, and less resilient to a changing climate and wildfire than they once were. There is currently broad agreement in the need to restore forests to a healthier and more stable condition, but less agreement on how to do so. In this talk, I will share what we have learned about climate resilience from forests in the central Sierra Nevada impacted by a recent severe drought. I will also discuss findings from forest management experiments that were burned over in recent wildfires, including the 2021 Antelope Fire on the Klamath National Forest. These lessons illustrate how forest density affects crown fire behavior, the value of reducing surface fire intensity through managing dead and down fuels with prescribed fire or other fire, the importance of maintenance, as well as the potential limits to what can be accomplished with forest management under the most extreme fire weather conditions.

Eric Knapp is a research ecologist with the US Forest Service, Pacific Southwest Research Station and has been based in Redding for the past 17 years. While his research dabbles in many aspects of the fire ecology of California's forested ecosystems, he specializes in the interface between silviculture and fire management. Among research projects that he and other agency and university scientists are involved with, are long-term ecological studies of forest and fuel management treatment options, including mechanical thinning and prescribed fire. He'll present findings from several of those today.

Seasonal Effects of River Flow on Water Temperatures in the Scott River

Eli Asarian, Riverbend Sciences

Years with deep mountain snowpack and resulting high groundwater levels extend the high flow season and keep Scott River water temperatures cool through the end of July, whereas in drought years the river warms sooner. Riverbend Sciences and the Quartz Valley Indian Reservation used 21 years of river flow and air temperature data to create statistical models that simulate daily water temperatures at the Scott River USGS gage, providing a tool for assessing the effects of water management. Our models allow the effect of flow on water temperatures to vary by season (i.e., stronger cooling in spring and summer), improving accuracy of the simulated temperatures. We simulated water temperatures under two alternative flow scenarios: 1) the USFS water right, and 2) CDFW's 2017 interim instream flow criteria. Our simulations indicate that relative to current conditions, these scenarios' higher summer flows would reduce the summer's hottest temperatures and delay the seasonal onset of temperatures that are stressful to fish. Conversely, diverting additional water from the river after 1 June (including for groundwater management purposes) could increase the number of days with stressful temperatures. Once peer review is complete (currently in-progress), our models will be freely available for public use. These methods can be applied to model any stream with long-term flow and water temperature measurements.

Eli Asarian is an aquatic ecologist/hydrologist at Eureka-based consulting firm Riverbend Sciences. He has worked in California and Oregon watersheds for over 20 years, specializing in statistical analysis of large, complex datasets and has authored many technical analyses on streamflow, stream temperature, water quality, and algae in the Klamath and Eel River watersheds.

CDFW actions to ensure survival of Coho and Chinook Salmon in the Scott River watershed during the 2021 drought emergency

Joe Croteau is CDFW's Klamath Watershed Program Manager.

The agencies are charged with maintaining a balance between regulatory and voluntary efforts. In the Scott River basin, the year 2021 was the 2nd critically dry year in a row, 3rd out of the last 4, and further indication of a drought trend that is stressing tribal, biological, and economic resources. Coho Salmon are listed under the Federal and State endangered species acts as Threatened and are still at a moderate to high extinction risk. Chinook salmon are vitally important for tribal and commercial fisheries and are declining in the Scott River at a faster rate than the Klamath Basin as a whole. Both species are indicators of ecological health. Multiple entities have genuinely acted on the need to cooperate and collaborate at many levels, recognized the need for funding, and supported public and private restoration actions. As a result, we have observed modest improvements to groundwater and surface water extraction, aquatic habitat restoration, and Coho Salmon production in the Scott River. Despite these efforts, the year 2020 represented a year that nearly eliminated an adult salmon migration. With another potential drought disaster looming, CDFW supported a stronger funding and regulatory approach to ensure survival of these two salmon species during a drought emergency. I am planning to acknowledge previous restoration and efficiency efforts, summarize the drought emergency, review the actions we took to ensure salmon survival for the future.

Joe Croteau is CDFW's Klamath Watershed Program Manager. His program's primary responsibilities include large-scale restoration, environmental permitting, drought response, juvenile salmon monitoring, and fisheries restoration granting in the California portion of the upper Klamath Basin. He has lived in the Scott Valley for approximately 22 years and has worked for CDFW for 25 years on a variety of Habitat Conservation, Wildlife, and Fisheries teams. He has been one of two tribal liaisons for the Region for a little over one year. He has been a hunter education instructor for about 11 years. He once served as a grant writer and president of the local unit of the Backcountry Horsemen Association. His goal as a program manager is to balance a conservation ethic with various tribal, biological, and economic interests; and eliminate the need for future CESA listing petitions.

Scott River Watershed Restoration - A Fish Tale

Betsy Stapleton, Project & Permit Development and Erich Yokel, Monitoring Supervisor, Scott River Watershed Council

The Scott River Watershed Council (SRWC) has been performing ecological restoration in critical Coho Salmon habitat in the Scott River watershed since 2014. Starting with the installation of the first Beaver Dam Analogue (BDA) structures in California, the SRWC and collaborators have designed and implemented a suite of restoration projects to address limiting factors to all life stages (adult spawning to year-round juvenile rearing) of Coho. The SRWC seeks solutions that offer multiple ecological services with an emphasis on the role beaver plays in stream systems. In conjunction with the ecological restoration program the SRWC has performed an extensive biological and physical monitoring program to demonstrate the effectiveness of restoration and better understand the life strategies of the fishery. The SRWC has performed mark and recapture efforts with PIT tags on juvenile Coho and passive detection with PIT arrays in Sugar Creek and French Creek since 2016. Returning PIT tagged adult Coho Salmon have been detected in the Scott River.

A Fish Tale tells the story of the habitats utilized by these returning adults as juveniles in tributaries of the Scott. The SRWC strives to continue to refine our understanding of limiting factors and successful life strategies while continuing to implement ecological restoration and enhance the beaver population in the Scott River.

Betsy Stapleton recently stepped down after 9 years at the helm of the Scott River Watershed Council as the Board of Director Chair. In that role, she oversaw SRWC's growth from a small educational group to a leading-edge restoration entity deploying in-stream and upland restoration and engaging in scientific research and restoration innovation. She continues to manifest her passion for the natural world in her current roles as SRWC's Project Development and Permitting Specialist.

Erich Yokel has performed over 20 years of natural resource work in Western Siskiyou County with a focus on Coho Salmon, stream habitat and water quality. Erich has worked with the Scott River Watershed Council since 2015.




Assessment of Scott River Salmon Performance Under Historical, Current, and Restoration Scenarios
Larry Lestelle, Biostream Environmental

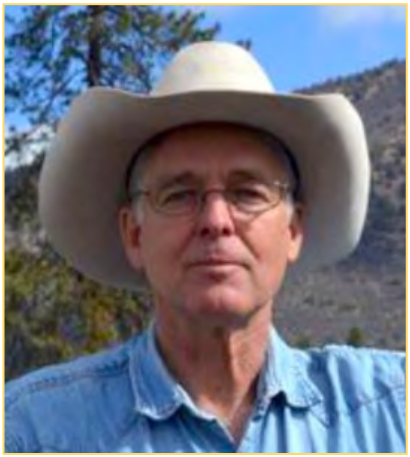
Salmon populations in the Scott River watershed have suffered sharp losses over the past century due to many contributing factors. The coho population, now a small remnant of its past abundance and part of broader conservation units, is listed as threatened under both the California Endangered Species Act (CESA) (CDFG 2004) and the Federal Endangered Species Act (ESA). Spring Chinook salmon, once abundant in the watershed, were extirpated in the last century. The fall Chinook population, the only remaining salmon population that demonstrates some degree of stability, has also experienced substantial loss.

The presentation will summarize an assessment of the effects of habitat changes on the performance of the three historical salmon species in the Scott River. The assessment was aimed at answering two questions: What is broken in the watershed with respect to salmon performance, and what needs to be fixed? Answering these two questions is fundamental to developing an effective restoration and salmon recovery action plan for the subbasin— if indeed such a plan can be developed and implemented. Based on the analysis of these questions, guidance is given for taking actions in the subbasin to help restore critical habitats and support recovery of the salmon populations.

The assessment is presented in three parts: (1) an analysis of historical and current baseline habitat conditions and associated salmon performance; (2) a diagnosis of the effects of past habitat alterations on salmon performance, and (3) an analysis of a set of generalized habitat restoration scenarios to address major limiting factors and provide guidance for prioritizing actions. The analysis was done using the EDT model, although all of the available empirical data on population performance were also analyzed. The work was done under contract to the Karuk Tribe.

Larry Lestelle is a fisheries scientist with over 45 years of experience in salmon and aquatic resources research, management, and conservation in the Pacific Northwest, California, and Alaska. He has expertise in a wide variety of issues related to population dynamics and modeling, salmonid ecology, resource assessment, habitat restoration, fisheries management, and environmental impacts. He was one of the lead architects of the Ecosystem Diagnosis and Treatment (EDT) Model, now widely used across the Pacific Northwest to assist managers and planners in salmon recovery, environmental impact assessment, and restoration. In the Klamath River, he has advised on research and recovery of coho salmon for the Karuk and Yurok tribes. His undergraduate and graduate studies in fisheries science were done at the University of Washington.

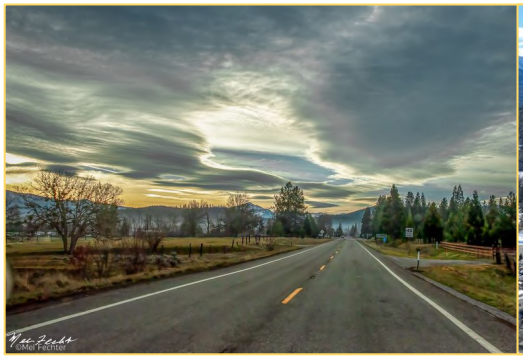
Ranching in Paradise, by Garth Plank, owner of the Scott River Ranch

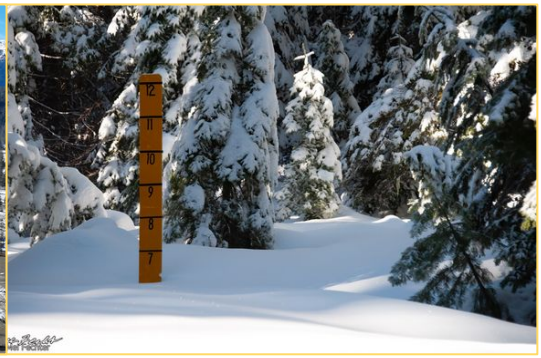


Gareth knew from an early age that he wanted to ranch. He set his goal to acquire one by the age of forty. His desire to ranch was predicated on his desire to raise his children in an environment rich in nature and to put his beliefs in stewardship into a practical application. Previously, he had a successful career at major New York and Zurich based investment banks as a senior “sell-side” equity analyst specializing in nonbank financial institutions with an emphasis in real estate finance.

His ranching dream was accomplished after a seven-year search through most of the western states, when he found the ideal location to relocate his young family from the San Francisco Bay area. He realized his goal by buying Scott River Ranch in 1998 at the age of forty. Located in the heart of Scott Valley, this almost 4,000-acre ranch encompasses the watersheds of the Marble Mountains, Trinity Alps, and Scott Mountains. Gareth currently runs an organic grass-based operation on the ranch and has been heralded as was of the most ecologically balanced ranches in the country.

Friday, February 18, 2022 - Legacy Mining Impacts and Restoration Summit - Avery Theater, Etna		
Time	Presenter	Title
10:00am	Michael Belchik, Senior Water Policy Analyst for the Yurok Tribe	Opening Commentary
10:15am	Paul Powers, Fisheries Biologist, USFS Enterprise Team	The Wayback Machine
11:00am	Erich Yokel, Scott River Watershed Council & Jay Stallman, Stillwater Sciences	A Glimpse Through Time: From a River to Rocks to Recovery
12:00pm	Lunch	
1:00pm	Matt Thomas, PE, CFM – Principal Hydraulic Engineer, Restoration Design Group, Inc	Horse Trough Springs Restoration Project
1:20pm	David Gaeuman, Aaron Martin, DJ Bandrowski, and Kyle De Juilio, Yurok Tribe	Trinity River Valley Restoration at Oregon Gulch
1:50pm	Toz Soto, Charles Wickman, Will Harling, and Mitzi Wickman	Building Back Salmon Habitats in the Middle Klamath after Gold Mining
2:15pm	Wes Scibner, Civil Engineering and CEO for the Yurok Tribe Construction Corporation	Processing Mining Remains for Restoration
2:45pm	Wrap up and final Q&A	
3:00pm	Adjournment	





Legacy Mining Impacts and Restoration Summit
Moderator
Michael Belchik

Michael Belchik is a Senior Water Policy Analyst for the Yurok Tribe, for whom he has worked for 26 years. Mike moved up to Humboldt County from the Bay Area in 1986, and has never looked back, working odd jobs like spotted owl hooter in Orleans, CA, evaluating grazing impacts to salmon in Idaho, and as a sucker biologist in Chiloquin, OR. Mike served as the Yurok Tribe's Klamath and Trinity River leads as Senior Fisheries Biologist in the late 1990's, before turning his attention solely toward Klamath River restoration including dam removal. Mike helps integrate Western science and Yurok values as part of his work, serving as a close advisor to the Yurok Tribal Council in complicated water and dam removal issues. More recently, Mike has taken on the position as the Tribe's Senior Water Policy Analyst. Mike previously served as the Yurok Tribe's technical lead during the Klamath Basin Restoration Agreement and Klamath Hydroelectric Settlement Agreement negotiations, has overseen technical studies of flow and habitat issues as they affect salmon and other species. Mike's main duties integrate policy, legal, technical, and traditional environmental knowledge (TEK) to further the stewardship and restoration vision of the Yurok Tribe.

The Wayback Machine

Paul Powers, Fisheries Biologist, USFS Enterprise Team

River valleys filled with mine tailing piles are easily recognized as being heavily altered and degraded. Any visitor or passerby can tell human pursuits have changed the river valley and left it in a damaged condition. What is often less recognizable and less agreed upon, is the pre-degradation state and therefore, target for restoration. For decades, the prevailing perception of a healthy and properly functioning river or stream has been of a dominant trunk channel intermittently connected to its floodplain. This channel would have repeating attributes and habitat features such as pools, riffles, and glides. The channel would access the adjacent floodplain during peak discharge events, thereby relieving excess stresses and maintaining a balanced flow and sediment regime. Restoration of these channels has included the adjustments of boundaries such as pattern, profile, dimension, and the addition of complexity elements. In this presentation I would like to challenge that notion of a river and offer an alternative perspective and target conditions for restoration. In this presentation I will share what we refer to as Valley Goggles and show how we use them to reveal the pre-degradation conditions present within dispositional valley types. With this new viewpoint, we envisage river-wetland corridors that are dramatically different from the current channel in form, function and ecological value.

Paul is a fisheries biologist with the USFS Enterprise Team who lives in Bend, Oregon. Paul began working on aquatic restoration projects in 1995 on the Gifford Pinchot NF in WA state. His earl experiences had him hooked and he has spent his career trying to better understand river systems and restore them to their former grandeur. As a longtime member of the Region 6 Restoration Assistance Team, he's worked with an incredible team of professionals expanding the boundaries of process-based rehabilitation, specializing in restoring depositional river valleys to the Stage 0 condition.

A Glimpse Through Time: From a River to Rocks to Recovery

Erich Yokel, Scott River Watershed Council and Jay Stallman, Stillwater Sciences

Prior to 1951, a floating dredge mined placer deposits within a 4.7-mile reach of the Scott River downstream of Callahan. The legacy impacts of dredging are pervasive and enduring, contributing to critically low salmon and steelhead populations in the watershed. Confinement by tailings disconnected the floodplain, simplified channel morphology, and coarsened the bed. Floodplain disconnection reduced groundwater recharge and storage capacity, as well as access to floodplain habitat that provided foraging, rearing, and winter refugia for salmonids. Historical mining realigned the river channel to the eastern valley margin, establishing a gradient in the shallow aquifer away from the present channel and toward the valley's west side. Consequently, the river channel goes dry and disconnects through the tailings reach during the spring baseflow recession through the fall, preventing anadromous salmonids from moving to and from the upper third of the watershed. Exposed tailings and lack of vegetation throughout the reach add to the river's thermal loading, contributing to the TMDL temperature listing.

The Scott River Watershed Council (SRWC) and its partners – including landowners, resource agencies, research institutions, and consultants – have been working within this reach since 2014 to identify, design, and implement recovery actions that restore habitat for Coho Salmon. While the long-term success of these site-specific projects is being evaluated, the SRWC project team is working in parallel to better understand reach-wide hydrologic and geomorphic processes and develop tools that (1) inform effective recovery actions, (2) can be used to assess the potential effects of proposed actions, and (3) support development of a prioritized, reach-wide recovery plan. This presentation will highlight our current understanding of existing conditions, introduce a proposed approach to reach-scale recovery planning, and preview tools that we anticipate could be used to evaluate and prioritize actions.

Jay Stallman, PG, RG (*M.S., Geology*) has over 25 years of experience developing, implementing, and managing projects related to identifying and controlling sediment sources; analyzing the effects of sediment supply, transport, and storage on channel morphology; and incorporating information about hydraulics, sediment dynamics, and geomorphic processes into aquatic and riparian habitat restoration design projects.

Horse Trough Springs Restoration Project

Matt Thomas, PE, CFM – Principal Hydraulic Engineer, Restoration Design Group, Inc

Almost every river and tributary in Northern California remains scared by gold mining. Dredge tailings and the remnants from hydraulic mining are easily recognizable, but these were not the only mining methods to create tailings. Drive the Klamath River Highway and one may notice mounds of coarse aggregate next to the river at various locations. These mounds were not created from dredging, but by a different method that used a water powered hoist to move the coarse aggregate that was too large to move by hand. Combine this with sediment influx reduction due to the Klamath River dams and the results are the river system disconnected from historical floodplains. These floodplains would have been inundated annually and provided additional winter rearing habitat for juvenile salmonids. Currently these floodplains, such as at the Horse Trough Springs project location, require a 10 to 25-year recurrence interval flow to begin to activate. The Horse Trough Springs project, initiated by Mid-Klamath River Watershed Council, is the first of 22 sites that plans to utilize these stockpiled coarse aggregates to rebuild existing riffles and recapture some of these historical floodplains that will help remake the complexity that was once prevalent along the Klamath River.

Matt Thomas has a long history with rivers. He grew up along the Scott River and took family camping trips to the Eel and Klamath Rivers. By the age of 16 he was a river guide and well on his way to becoming an accomplished whitewater kayaker. After graduating from Etna High School, he completed his Bachelor's in Civil Engineering from the University of Idaho in 2000, while exploring the rivers of Idaho and Montana. He spent the next 8-years engineering complex storm drain systems, culvert replacements, and roadway improvements mostly in the Puget Sound region, while also exploring the steep creeks and rivers from Canada to California in his whitewater kayak. In 2009 he suffered a spinal cord injury leaving him paralyzed. While participating in an aggressive physical therapy program he completed a Master's in Civil Engineering from Colorado State University. Matt joined RDG in 2015 and for the past 7-years has led the design and modeling of several restoration projects.

Trinity River Valley Restoration at Oregon Gulch

David Gaeuman, Aaron Martin, DJ Bandrowski, and Kyle De Juilio

Hydraulic gold mining on upland hillslope in the late 19th-century followed by 20th-century dredger mining on the valley floors severely damaged many stream systems in the Klamath watershed. Among the more heavily impacted areas is the stretch of the Trinity River from near Junction City, CA, to near Coffee Creek in the Trinity Alps, a stretch in which many alluvial valleys were converted to fields of tailings piles that can rise more than 40 feet above the adjacent channel bed. The Yurok Tribe, in conjunction with the Trinity River Restoration Program, has designed and intends to begin implementing in 2022 what may be the most comprehensive stream and valley restoration attempted to date at one such location, the Oregon Gulch site near Junction City. The Oregon Gulch design consists of the complete removal of about 25 acres of bucket-line dredge piles representing a total excavation volume of 520,000 cubic yards. The majority of that area will be lowered to a level that inundates at about 600 ft^3/s, a discharge that is exceeded about 70% of the time during the winter months when juvenile salmonids are present. As a result, the availability of salmonid rearing habitat over a range of frequent discharge levels is expected to increase by as much as 1000%. The expected increase in the area of alluvial valley inundated by frequent discharges due to the Oregon Gulch project (32 acres) represents a nearly 5-fold increase within the site and a 50% increase in the total area of floodplain subject to frequent inundation throughout the 40 miles of the Trinity River between Lewiston Dam and the North Fork Trinity River.

David Gaeuman joined the Yurok Tribe Fisheries Department in 2019 after 13 years as a U.S. Bureau of Reclamation employee in the Weaverville TRRP office. Prior to arriving in Weaverville in 2006, he spent 3 years conducting sediment transport research in the Missouri River with the U.S. Geological Survey and worked in stream monitoring and restoration throughout the mountain west while earning a master's degree in stream geomorphology at the University of Montana and a Ph.D. from Utah State University.

Building Back Salmon Habitats in the Middle Klamath after Gold Mining

Toz Soto, Charles Wickman, Will Harling, and Mitzi Wickman

The Karuk Tribe and the Mid Klamath Watershed Council do fisheries restoration within and around mine tailings. These mine tailings have channelized the mainstem Klamath River and its tributaries. Completed restoration efforts that deal with this channelization have been focused on a handful of restoration techniques and include: 1) widening channels with the use of heavy equipment, 2) adding wood structures, 3) creating off-channel features, 4) connecting old mining ponds to streams, 5) installing Beaver Dam Analogs, and 6) planting in the mine tailings near the newly created fish habitat. Additional restoration techniques are planned and include: 1) adding mine tailings to riffles and 2) creating large planting islands in the tailings.

Toz Soto, Fisheries Program Manager for the Karuk Tribe Fisheries Program B.S., Fisheries, Humboldt State University, 1996. Toz has worked as the lead fisheries biologist for the Karuk Tribe Fisheries Department since 2002 and has helped lead the Klamath River Coho Ecology Study in conjunction with the Yurok Tribe and other basin partners as well as conducted multiple Coho life history studies in the Mid Klamath River.

Charles Wickman, Co-Director Fisheries Program, Mid Klamath Watershed Council. Charles Wickman has been planning, designing, implementing and monitoring fisheries restoration projects within the Mid Klamath River Sub-basin since 2005. In 2008, Charles was hired by MKWC to co-direct the Fisheries Program with Executive Director Will Harling, and has since worked in coordination with MKWC staff, various agencies, the Karuk Tribe and several local landowners to develop and implement large scale habitat restoration projects, as well as dozens of small scale, non-mechanical projects, directly benefiting state and federally listed Coho Salmon.

Will Harling, Executive Director. Mid Klamath Watershed Council (MKWC), Fisheries Program Co-director and Fire/Fuels Program Co-director B.S., Environmental Biology, Humboldt State University, 1999. Will was a founding member of MKWC in 2001. He has worked for the USFS and other governmental and non-governmental agencies since 1993 in the field of natural resources, focusing on fisheries work. Will has managed dozens of fisheries and watershed restoration projects in the area and has a close working relationship with local, state, tribal and federal agencies, as well as residents throughout the Mid Klamath Sub-basin.

Mitzi Wickman, Fisheries Project Coordinator, Mid Klamath Watershed Council. B.S., Ecology and Systematic Biology, Cal Poly San Luis Obispo. Mitzi has worked in the natural resource and land surveying fields since 1991. She has been on field crews for twenty seasons as a fisheries crew leader, fisheries biologist, or a member of land and hydrographic survey crews.

Processing Mining Remains for Restoration

Wes Scibner P.E., Civil Engineering and CEO for the Yurok Tribe Construction Corporation (YTCC)

Much of the restoration work performed by the Yurok Tribe Construction Corporation (YTCC) occurs in areas of severe historical mining and dredging operations along rivers and streams. These areas are typically marked with mountains of tailing piles stored along active waterways impeding the natural movement of rivers. This talk will address the construction challenges of processing this material to meet design requirements, estimating potential yield of desired class of materials, effective equipment for the tasks, and what to do when you can't hit the mark. We will be exploring the Chapman Ranch Phase B project located on the Trinity River and constructed in 2021 as an example of these techniques and lessons learned.

Wes is a Civil Engineering and CEO for the Yurok Tribe Construction Corporation (YTCC) actively implementing large scale restoration projects throughout the north state. Prior to the startup of the YTCC in February of 2021, Wes's career history consisted of self-employment in civil design, over a decade of special district management and county government in transportation and water resources, and over 15 years of construction development and project management. Wes was an active member of the North Coast Resource Partnership's Technical Peer Review Committee for several years giving him intimate knowledge of challenges and progress regarding natural resources in the north coast region of California.

Thank you to all our 2022 SWIF &
Legacy Mining Impacts and Restoration Summit Presenters
and to those who make work in the Scott River watershed possible.

Above all else, thank you to our private landowners who allow restoration work to be done on their property!