



Mid Klamath Watershed Council

2023, Twenty Fourth Edition

On the Ground Effects of Restoration

Restoration—Seeing the Difference on the Ground

By Director Luna Latimer

The MKWC staff chose as a theme for this newsletter: *On the Ground Effects of Restoration*. I love this topic. It is what I think about constantly. It is what keeps me up at night. It is what motivates me to start another day. Last week a member of MKWC’s Board of Directors wrote in an email: “The TREX underburn at our homestead helped save my life in the 2020 Slater Fire by reducing the intensity of the radiant heat in the immediate area of my safety zone.” We always talk about something like this being an effect of our work, and it is powerful to hear it in so few words.

I firmly believe that it is our obligation, as we do restoration work, to continually ask ourselves: What are we doing? What are the consequences? What are the ripple effects—those primary, secondary, and tertiary benefits or unexpected outcomes. Who is doing the work? Who is benefiting? In this edition of the MKWC newsletter, you will hear about the effects of the work that we do. This newsletter feels like a love letter to our workers—a reward for hours of toiling behind computers and compliance documents, braving poison oak, hazardous weather, and steep slopes—a reminder that what we do matters.

Beyond the on-the-ground impacts of ecosystem restoration, there are also so many benefits to community vitality and restoration of human connection to place. We are creating a workforce with a deeper understanding of place and our



Orleans Elementary School students take biosamples on a Chinook salmon carcass during a fall 2022 survey. *By Carol Earnest*

connection to it. We are engaging youth in stewardship and exploring the positive role that humans can play as stewards on the landscape. We are creating jobs and improving community vitality. Working in the field of ecosystem restoration is incredibly humbling. Our human lifespans are so short compared to the timeline of restoration. Investment in a culture of connection to place over time, over generations, is the only viable long-term strategy. We want to invest in the people who will invest in their children and the people that will continue to be here generation after generation to steward this place. These lessons of the Karuk people and other local Tribes have inspired us and many other people in this community to accept our responsibility to place.

Do You Want to Get Connected to Place, Too?

Join us for a volunteer workday this summer (volunteer opportunities are on page 29). Support MKWC with a donation (please see the donation envelope insert in the physical copy of the newsletter, or visit www.mkwc.org/donate). Consider donating to the local Native Stewardship groups like the Karuk Endowment for Ecocultural Revitalization or the Cultural Fire Management Council. Or, just spend more time outside. That is really where the magic is happening.



MKWC’s Rachel Krasner monitoring for Coho Salmon in the Winter of 2022. *By MKWC Fisheries*

A Future Without Dams

By Carol Earnest



Students from Happy Camp Elementary School at the base of Iron Gate Dam. *Photo by Alora Sutcliffe*

On a chilly April day, students from Happy Camp High School, Yreka High School, and Jackson Street Elementary School (Yreka) load into vans and travel the windy road to the site of the largest dam removal and river restoration project in history.

Students spill out of the confines of their school vehicles onto the gravel lot flanked by the Klamath River at the base of Iron Gate Dam. We gather in a large circle and listen to Ryan Reed of Save California Salmon and Tai Kim of the Mid Klamath Watershed Council introduce the day. We are here so this next generation of leaders and environmental stewards, many of whom participate in the Karuk Youth Leadership Council, are empowered by the history of Indigenous activism around Klamath River dam removal, learn about the impacts of a broken river system, and envision what river restoration may look like in the years that follow. We are here to experience this specific moment in time, waving good-bye to the dams that have caused cultural and environmental hardship on these Indigenous students' ancestral lands for the past 100 years.



Students from Happy Camp Elementary School learn about culturally important plants from Kathy McCovey and Stormie Jackson Polmateer at the Iron Gate Dam overlook. *Photo by Dave Meurer.*

A striking place to take in the scale of this dam removal project is at the overlook above Iron Gate Dam, the first of four dams on the Klamath as you travel upriver. At the overlook, students hear from Dave Meurer of Resource Environmental Solutions (RES), the lead contractor for watershed restoration post-dam removal. Dave explains the vast scope of restoration after dam removal: planting billions of seeds from 98 species of native plants, planting tens of thousands of native oak trees, harvesting and placing up to 1,000 trees (with root wads intact) in tributaries for structure and habitat, and ensuring reconnection of tributaries.

The students also learn the nuts and bolts of dam removal; how the dams will be removed on a schedule, starting with Copco 2, which is already underway and will be completed this year. Construction contractors will create an opening at the base of the dams, slowly draining each reservoir like a bathtub. As the reservoirs drain, RES will work with local Tribes to race against invasive non-native plants by revegetating with native seeds in strips following the lowering water level. The landscape beneath the reservoirs will be revealed, and the cool, clean tributaries that used to drain into an unhealthy reservoir, will once again enter into a free flowing river.

But why are we removing these dams? It's a question posed to the students that prompts quick responses, including barriers to fish migration, poor water quality, and the loss of cool flushing flows that come with seasonal variation in water levels. What about the electricity produced? It only accounts for less than 2% of PacifiCorp's portfolio and it has already been replaced. What about the irrigation and city water it provides? None of the reservoir water is used for this purpose. What about flood control? The dams are not operated for flood control. What about the jobs lost? The anticipated jobs created through the restoration economy, the return of robust salmon runs and river recreation industry, will far outweigh any loss. For more FAQs: <https://klamathrenewal.org/faqs/>.

Volatile storm cells quickly sweep across the landscape and dapple Iron Gate reservoir with bright sunlight followed by dark rain shadows, a dramatic backdrop for the powerful words spoken next by Ron Reed, Karuk dipnet fisherman and cultural biologist. Ron has been in the dam removal fight since the beginning. He describes the critical importance of the river to health and culture and the challenges of encouraging the practice of fishing and ceremonial bathing while the fisheries disappeared and the summer water quality deteriorated with the increase of toxic algae. No matter the condition of the water, the river is central to culture and ceremony. It was clear that the impact of these dams was deteriorating the health of an entire ecological system and the people that have been stewarding it since time immemorial. The 2002 fish kill catalyzed the organization of Tribal activists and river advocates, and the unyielding fight for Klamath dam removal persisted for more than 20 years.



Ron Reed at the overlook above Iron Gate Dam. *Photo by Tai Kim*

Now, we are celebrating a victory. But Ron doesn't just see this as a victory for Tribes and river advocates. This is a victory for everyone living in the Klamath watershed, as we all benefit from a healthy river that supports an abundance of fish, wildlife, and river recreation. He says that though dam removal is a crucial step towards watershed restoration, it is a piece of the bigger restoration picture, that includes frequent use of Indigenous fire, and efforts to restore waterways impacted by logging and mining. Ron explains to the students that there is a pendulum that swings between Traditional Knowledge and Western Science, and that **by working together we can see this pendulum come to an equilibrium that fosters understanding and mutual benefit between all of our community members.**

From the overlook, students descend back down to the base of the dam and visit the hatchery run by California Department of Fish and Wildlife. The hatchery was created in an effort to mitigate the impact of the dams, which cut off over 400 miles

of spawning ground to Chinook and Coho Salmon. After learning about the inner workings of the hatchery and getting some peeks at the 7 million juvenile Chinook salmon on site, Alex Corum, fisheries biologist from the Karuk Department of Natural Resources, explains that hatcheries are a stop gap that provide life support to a degraded salmon fishery, and that with a healthy river system, we can better support wild salmon that have stronger and more resilient genetics, and reduce our reliance on hatchery fish.



Students from Happy Camp Elementary School learn about the Chinook life cycle at the Iron Gate Hatchery. *Photo by Maya Williams*

As we wrap up the day, I keep thinking about something that Frankie Tripp of the Karuk Department of Natural Resources Pikyav Field Institute said to the students earlier that day. She said that her children will grow up in a world in which there are no dams on the Klamath. It will be a distant memory for them, if they remember it at all. I think about this group of high school students and wonder how they will think about the dams in the future. I wonder if it will be a distant memory for them. I wonder if they will think back on the day they visited Iron Gate one last time, looking down on a massive earthen dam with a large reservoir plugged behind it. I hope they will



Students from Happy Camp High School, Yreka High School, and Jackson Street Elementary at the overlook above Iron Gate Dam. *Photo by Tai Kim.*

remember that snapshot in their mind, so that when they go back and see a river there instead, they can tell the story about the time the Klamath was a dammed river, and how their elders fought for decades so that the future generations could know a reality in which the river flows free.

This spring, 150 students from seven different Klamath River schools visited Iron Gate Dam over the course of three field trips. Field trips were organized collaboratively with partners

from the Mid Klamath Watershed Council, Save California Salmon, the Karuk Department of Natural Resources, and the Karuk Tribe Education Department, with the support of Resource Environmental Solutions and CA Department of Fish and Wildlife. Special presenters: Ron Reed, Kathy McCovey, Ryan Reed, Frankie Tripp, Regina Chichizola, Will Harling, Alex Corum, Chook-Chook Hillman, Mitzi Wickman, Charley Reed, Stormie Jackson Polmateer, Dave Meurer, Gwen Santos, and Jeff Campbell.

2023 KLAMATH ADVENTURE OUTDOOR SERIES

THURSDAYS THIS SUMMER

Cost-free day-long rafting adventures for youth



July 13 - Ages 10+
Rafting on the Klamath River near Happy Camp with invasive plant removal.

July 20 - Ages 10+
Rafting on the Klamath River near Somes Bar with fish habitat enhancement.

July 27 - Ages 7+
Rafting on the Klamath River near Orleans with fish habitat enhancement.



RAFTING
SNORKELING
GAMES
EXPLORATION
STEWARDSHIP ACTIVITIES
LUNCH PROVIDED

APPLY TODAY!

Apply online at mkwc.org/youth-summer-programs or pick up an application at the MKWC office in Orleans.

For more information contact
youth-programs@mkwc.org
or 530-626-3202 x1001

SCAN THE QR CODE TO LEARN MORE AND APPLY.



MID-KLAMATH REGION

SUMMER SCAVENGER HUNT

Interested in the Karuk names listed here? Visit Ararahih'urípih, the Karuk language dictionary hosted by UC Berkeley, at linguistics.berkeley.edu/~karuk/

Find at least 10 of the items on this list and send any photos (you are able to safely capture) to community@mkwc.org to receive a prize!

English name *Scientific name* Karuk name *By Maya Williams*



Silver Lupine
Lupinus albifrons
amtáparas



Dragonfly
atayramsishxárahahar



California Kingsnake
Lampropeltis getula
yumaaráapsuun



Spring Chinook
Oncorhynchus tshawytscha
ishyáat



Western Columbine
Aquilegia formosa
kishvufsansáanhitihan



American Black Bear
Ursus americanus
vírusur



Juvenile Coho
Oncorhynchus kisutch
achvuun



Siskiyou Lewisia
Lewisia cotyledon
ásak ithríhahitihan



Western Tanager
Piranga ludoviciana
ishviripchêex



Monarch Butterfly
Danaus plexippus
xatínniim



Young Common Mergansers
Mergus merganser
itkaar



Newly hatched frogs
yuxnamxanchlíifich



California Poppy
Eschscholtzia californica
sinvanáhiich



N. American River Otter
Lontra canadensis
amvámvaan



Beargrass
Xerophyllum tenax
panyúrar



Rufous Hummingbird
Selasphorus rufus
xanpuchiniishveenach



Blackcap Raspberry
Rubus leucodermis
patúruupveen



Bullock's Oriole
Icterus bullockii
kuvíiviich



California Giant Salamander
Dicamptodon ensatus
púfpuuf



Golden Chinquapin
Castanopsis chrysophylla
sunyithih

Looking to the Future Dam Removal on the Klamath

By Blythe Reis



Nothing can be more momentous to our community and restoration in the watershed than the removal of four dams on the Klamath River. The removal of Copco 2—the smallest of the dams has begun and will be removed this year. The other three dams will be drawn down in January of 2024 and removed throughout the year. A great article, “Undamming (and Restoring) the Klamath” by Thadeus Greenon gives insight into the removal and restoration process over the next few years and can be found online at the North Coast Journal website (see QR code above).

There will be a lot of money coming down from both State and Federal sources (\$162M via the Bipartisan Infrastructure Law alone) to fund ongoing restoration efforts over many years. MKWC has started to receive some funding towards this effort, along with many other groups working in the watershed.

Here are just a few resources for information about this massive effort:

- The lead organization for dam removal is the Klamath River Renewal Corporation. Their website is: klamathrenewal.org

There are many job opportunities listed on their site for those wanting to get involved.

- The lead contractor for restoration is Resource Environmental Solutions, who along with area Tribes will plant up to 19 billion native seeds as the Klamath dams come out and reservoirs are drained. More information in this article from Oregon Public Broadcasting, “After the dams: Restoring the Klamath River will take billions of seeds” (see QR code above).

- Another great resource for learning more about the Dam Removal is the website: bringthesalmonhome.org/understanding-dam-removal/#why

- Klamath Basin Salmon Restoration Request for Proposals—the National Fish and Wildlife Foundation, will award up to \$1,409,500 for Klamath River projects. To get an idea of the variety of projects being funded, check out their website (see QR code above).

To learn more about the Klamath River in general go to: www.californiasalmon.org



The Iron Gate dam in northern California, one of four dams to be removed from the Klamath River.
Photo: Anna Murveit / KRRC



What it might look like after the dam is removed.
Creator unknown

Making More Fish

By Charles Wickman

There are many metrics for measuring the success of a fisheries restoration project, but only one matters: *did it make more fish?* All the others are stepping stones toward succeeding at this one. But sometimes you get to do work on a stream that gives you a head start.

In 2013, MKWC and the Karuk Tribe were invited by a local resident to develop some off-channel rearing habitat (aka “pond”) for Coho Salmon along Middle Creek, a small tributary to Horse Creek in the upper basin. Though no one had data suggesting this little creek had a population of Coho Salmon, it sure looked like a Coho stream. It had all the basic ingredients. It drained a small watershed with a relatively low headwall, which meant it probably didn’t get the kind of rain-on-snow driven velocities every year that could scour and destroy newly constructed Coho redds or make life challenging for a small fish emerging from the gravel in the early spring. The small valley’s slope was gentle, there was plenty of perfectly sized gravel for spawning, and the water temperatures were cold. And it did have Coho. We found a decent juvenile population making a living in the few pools



Pond #2 was constructed in 2015. This project took advantage of a strong groundwater connection that existed at the site. This is critical for affective off-channel rearing habitat as ground water provides relatively stable temperatures and dissolved oxygen levels rear round. Stable temperatures, no-flow habitat, and aquatic insect production provide optimal growth conditions for juvenile Coho Salmon and improve their chances of survival as they later navigate their way down the mainstem of the Klamath River.



Himalayan Blackberries took over the Middle Creek riparian after the 2016 Gap Fire burned through much of the Horse Creek watershed.

this creek had. What Middle Creek lacked, most notably, was decent rearing habitat for juvenile Coho. The channel was incised and lacked sinuosity, wood, pools, and cover for fish... if you didn’t count the Himalayan blackberries that had taken over the riparian area and choked the creek’s channel in places.

Coho Salmon, unlike Chinook Salmon, spend their first year (plus a little more) in fresh water. This means they need to contend with winter and spring flows, which can be punishing or lethal in a “normal” year. Because of this need, or in concert with it, Coho evolved to thrive in gentler conditions than Chinook. They thrived in creeks and rivers that created oxbow ponds as their unconfined channels meandered freely across floodplains, or had blind side channels where wood jams might cause the channel to find a new path, or had healthy beaver populations which would create pools and wetlands behind dams. These environments offer low flow or no flow conditions for a rearing Coho to conserve energy, eat well, and grow fat and healthy for its upcoming outmigration to the ocean. But these kinds of environments and the conditions they provide Coho are largely absent from today’s Klamath River tributaries, much like the robust populations of Coho Salmon that used to swim their waters.

So in 2014, we built a pond creating a cheap but effective imitation of Coho’s former winter rearing habitat, connected it



Healthy juvenile Coho rear in one of Middle Creek's constructed off-channel habitats.

to Middle Creek with a small outlet channel, and juvenile Coho immediately began to move into it where they would spend the winter before riding the following spring's flows out to sea, a little bigger, a little more resilient, and a little more likely to make it back in two years as spawning adults. The following year we built another, and the fish responded the same way. So, by that limited metric, our restoration succeeded. We built over-wintering rearing habitat where none existed and fish used it. But did it make more fish?

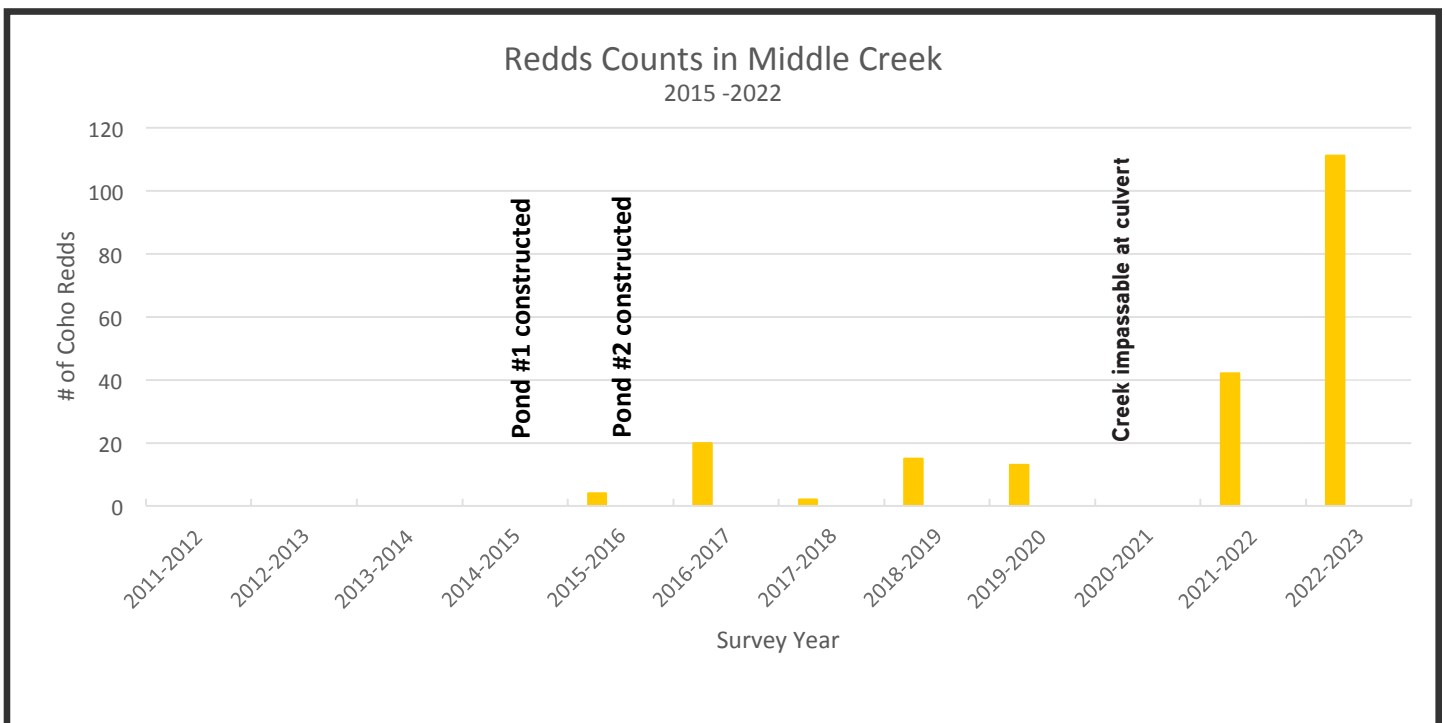
Coho have a strict three year life cycle, which means they spend roughly one year in fresh water and two years in the ocean before coming back to spawn at the end of their third year. So we can safely consider each year of any given three year period

as representing a unique cohort of fish. That means that a fish that emerged from the gravel in December of 2013 will return to its natal creek to spawn (if it's lucky enough) in the winter of 2016, and the progeny of those fish will spawn in the same creek three years later, and on and on. MKWC has been doing Coho spawning surveys on Middle Creek each year since the winter of 2015/2016, the winter after our first off-channel habitat project was constructed on the creek. The graph below tracks the spawning numbers on Middle Creek for that period.

The graph might not seem to show eye popping results, but the numbers tell a story, and the story looks pretty good. As everyone knows, the last several years have been drought ridden, and most of the last decade we've seen our first real



After a successful return to Middle Creek, these two are ready to spawn.



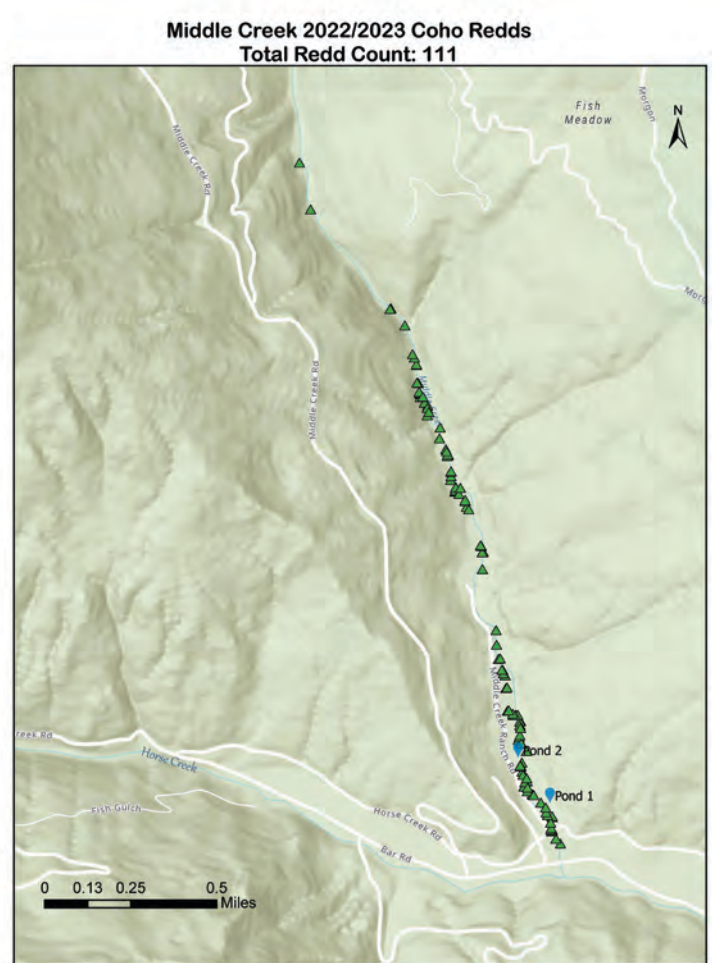
rains coming in later than usual. This has been a problem for Coho trying to spawn in Middle Creek, due largely to the old culvert near the mouth of the creek. Coho return to spawn in this part of the river sometime between November and January, and if there is not enough flow passing this culvert when they show up, they'll spawn in Horse Creek. This isn't the best scenario. Coho don't want to spawn in the lower reaches of big creeks like Horse Creek. Flows and velocities can destroy redds and make a Coho's lifelong effort all for naught. Over several of the years represented on the graph, the culvert acted as a partial barrier, with a few fish making it into Middle Creek later in the season while earlier fish were forced to spawn in Horse Creek. And one year, 2020/2021, the rains came so late we had no fish in Middle Creek at all.

The last two years begin to reveal some success. Last year, Middle Creek had the right flows at the right time, despite being a very dry winter, and produced the highest number of spawning fish since we began tracking. At 42 redds, little Middle Creek boasted the highest density of spawning on any tributary within the Klamath River basin. And this year, the closest year we've had to a "real" winter, with earlier and sustained flows, Middle Creek blew us away. We tallied a whopping 111 redds in this little creek. And these fish are descendants of the fish that reared in our first pond back in 2014.

Middle creek isn't off the hook for having issues, though. That culvert, for one. We are working on it. More off-channel projects, instream wood loading, and riparian restoration has been funded and will be implemented within the next two years up and down Middle Creek. We are currently seeking implementation funding for a designed bridge replacement. The hard science may still be out, but it's starting to look a lot like we are making more fish!



This Middle Creek culvert under Barr Road acts as a complete barrier for juvenile fish and a partial barrier for returning adult Coho Salmon. It also poses a structural threat to Barr Road.



Distribution of 2022/2023 Coho redds in Middle Creek.

And of course none of this would have been possible without the hospitality of supportive landowners throughout the Horse Creek watershed, as well as willing funders, including PacifiCorp, the U.S. Fish and Wildlife Service Partners for Fish and Wildlife Program, the Bureau of Reclamation, and the California Department of Fish and Wildlife.

For more information on our off-channel habitat projects, or any of our work, please visit our website at mkwc.org, or contact Charles Wickman directly at charles@mkwc.org.



Coho Salmon spawning
By MKWC Fisheries

Instream Large Woody Debris: A Collaborative Partnership

By Mitzi Wickman

Seeing a difference in spawning and rearing habitat in mid-Klamath River tributaries after adding large wood structures.

Aikens Creek

Summer 2020—This was a summer the likes of which I had never experienced. It was the summer where the mid-Klamath communities would be shocked by the devastating Slater Fire in Happy Camp. It was also the first summer we were navigating Covid. The Mid Klamath Watershed Council Fisheries Program, the Six Rivers National Forest, the Karuk Tribe, and the Yurok Tribe, decided to forge ahead anyway on a fisheries restoration project on Aikens Creek, a small tributary to the Klamath River near Weitchpec. The project was funded by the California Department of Fish and Wildlife’s Fisheries Restoration Grant Program and the Bella Vista Foundation. On August 11, 2020, under the haze of the Red Salmon Fire, we convened at the project site.

The Objective

Add 88 logs to a ½ mile section of Aikens Creek, between the Highway 96 bridge and its confluence with the Klamath River.

The logs were placed into the creek by an excavator, forming 24 wood structures. Among other reasons, the logs in the wood structures were strategically placed to cause the creek, during high flows, to back up and slow the water down. This type of restoration action is common since it mimics what happens naturally. When streams have large riparian trees, these trees fall into the creek and create changes to the channel that include:



August 11, 2020. On the ground implementation crew on one of the stockpiles of logs that were added to the creek, to benefit Klamath Basin fish, wildlife, and plants. All photos this article by MKWC Fisheries, unless noted

- Creating slow pockets of water for juvenile fish to grow,
- Scouring deep pools,
- Backing up water so that the creek spreads out over its floodplain during high flows (which gives small fish access to lower velocity water and also access to terrestrial food),
- Retaining and metering spawning gravel, and bringing in spawning gravel from the wider floodplain as the stream carves new channels.

This type of restoration technique requires patience to see if a difference was made. This April 2023, two and a half years



August 10, 2020. Aikens Creek, Wood Structure #21 site, BEFORE wood structure was installed.



November 27, 2020. Aikens Creek Wood Structure #21 site, AFTER wood structure was installed.



April 7, 2023. Aikens Creek Wood Structure #21 site, this photo was taken from downstream of the structure, looking upstream. This photo shows how the creek flows around the wood structure, creating multiple fish passage routes. Leroy Cyr (Six Rivers National Forest Service) can be seen in the photograph.



April 7, 2023. Aikens Creek Wood Structure #21 site, MONITORING RESULTS. The wood structure is backing up the creek and causing the higher flows to get up on the creek's banks, causing the creek to slow down, allowing for the deposition of spawning gravel. Another benefit, fish get access to terrestrial food sources as the higher water inundates the creeks floodplain area. Fish are able to swim past the wood structure by using side channels created by flanking flows. People in photograph are Aaron Martin (Yurok Tribe), Alex Corum (Karuk Tribe) and Bryan Souza (MKWC).

later, we went to the project site to check it out. What we saw gave us encouragement that all our efforts were producing the results we desired.

Horse Creek: Making a Difference!

Since 2010, the MKWC Fisheries Program and Partners have installed over 120 large wood structures into three miles of tributaries to the Klamath River. About half of these wood structures were installed into two miles of Horse Creek. That creek has seen a large increase in the number of returning adult Coho Salmon. There were an estimated 426 Coho Salmon adults in the 2022/2023 spawning season and an estimated 388 Coho Salmon adults in the 2021/2022 spawning season. These are numbers that are approximately four times that observed in the prior six spawning seasons. See aerial photo of a large wood structure added to the Horse Creek watershed bottom right, this page.

We have been analyzing our restoration work over the last 10 years by monitoring physical changes to the streams (is there more spawning gravel?, more deeper pools?, a decrease in storm velocities?, how often does the stream get onto its bank?, etc.) and by monitoring how the fish have been responding (utilization of the new habitat, increased population size). After so much effort into restoration work in the Horse Creek watershed over many years (seven off-channel ponds for a total of 0.89 acres and 55 wood structures over two miles), it is rewarding to see the increase in the number of returning Coho Salmon adults and feel it was well worth it.



April 14, 2023. Horse Creek Wood Structure #5, on the ground, showing how the wood structure retains gravel.



April 14, 2023. Horse Creek Wood Structure #5, from the air, in the project reach upstream of Salt Gulch, showing how the wood structure creates pockets of slow moving water for small juvenile fish to find refuge in, when the stream is flowing high. This wood structure was added to Horse Creek in the fall of 2020. *Photo by Michael Hentz.*



October 8, 2020. Horse Creek Wood Structure #13 site, BEFORE wood structure was installed.

We will continue to see how the streams change and fish respond to the restoration, adjusting our work as we learn, to best meet their needs. **For now, the fish seem to be indicating that we're on the right track.**



April 18, 2023. Horse Creek Wood Structure #13 site, AFTER wood structure was installed.

Using Prescribed Fire to Restore Pre-Settlement Forest Structure

A Case Study of the West Simms Burn Unit in Orleans, CA

By Will Harling

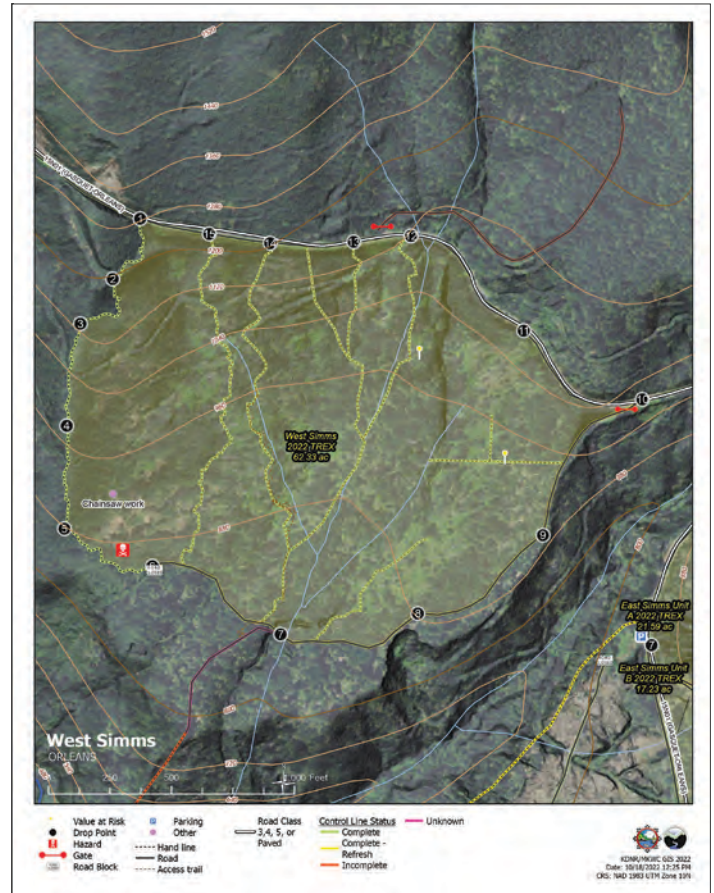
You can feel it here, that even as we make some mistakes, we are making a difference. We are learning by doing, and sharing that knowledge so that we can create a vision together for how to bring fire back to this land in a good way.

Ecosystems in the Klamath Mountains are greatly departed from their historic, pre-Settlement Era conditions due to the cessation of Indigenous burning and subsequent fire suppression that led to extreme fuel loading and the widespread loss of open habitats including true oak woodlands and meadows. Fuel reduction treatments, including manual and mechanical thinning, and prescribed burning, have been ineffective at preventing these losses largely because they are only being implemented at 5-10% of the scale needed to adequately protect communities and allow for the use of managed wildfire within current social and political constraints. It is within this context that Klamath Prescribed Fire Training Exchange (KTREX) partners, including the Karuk Tribe and Mid Klamath Watershed Council (MKWC), began experimenting with methods to increase the scope and scale of forest treatments in the Western Klamath Mountains.

One of these experimental units is the 70 acre West Simms unit, located on Tribal and private lands approximately two miles up the GO Road from Orleans. While most burn units receive manual or mechanical thinning treatments to reduce accumulated fuels before we burn, KTREX organizers saw an opportunity with West Simms to experiment with using this fuel build up in the right burn window to thin the even aged thicket of Douglas-fir and tan oak that was choking out riparian meadows and white oak woodlands, and creating a ladder of fuels in remaining unlogged legacy mixed conifer stands.



A returning meadow at West Simms. By Will Harling



Map of the West Simms Burn Unit with Personnel Lines (Green)
Created by Chris Root, MKWC

The West Simms unit is bounded by the GO Road to the east, a long hand line that comes down a ridge from the GO Road on the north flank, and a meandering dirt logging road that leaves the GO Road just north of Simms Gulch heading northwest across a huge ancient alluvial terrace and ties into the handline before the ridge dives into the Camp Creek drainage. The northern portion of the unit was never logged, and massive seven-foot-diameter Douglas-firs, and giant tan oaks and madrones, some with cavities so big you could live inside them, give us a glimpse of the once and future forest. As you move south across the unit, fingers of several small streams follow the slope from east to west, converging to pass through a culvert on the west line before dropping steeply into Camp Creek. On the southern edge of the unit, there are unique patches of white oak grassland adjacent to diverse riparian areas with Oregon ash, and an almost pure stand of madrone along the ridge bounding the unit on the south.

The West Simms unit before our first burn in the Fall of 2015 was a labyrinth of diverse fuels, each grueling to pass through



Photos from the October 4-5, 2015 Klamath TREX prescribed burn at West Simms By Will Harling

in their own respective ways. There was nearly a foot of duff in much of the legacy forest areas, with dense thickets of 10-30 foot tall tan oak sprouts. The dust kicked up from the tan oak leaves in summer brought on the symptoms of an instant head cold. Each rivulet was an impenetrable wall of ten-foot-tall Himalayan blackberry climbing the ash, alder and young Douglas-firs. In the heart of the unit where it had been logged, vast evergreen huckleberry thickets left only two unsavory choices: post-hole over the top of the undulating sea, or belly crawl through fox runs underneath. The only thing this impenetrability attracted were some guerilla pot growers who had left a tangled web of poly water line and rotting metal oil drums from their scraggly patch in the riparian areas, abandoned when the firs took away the light to their plants.

The stage was set for this forest to be completely reset in the next wildfire. The 2015 Klamath TREX burn here was planned with the understanding the drought could persist for years, and we had to do what we could to scale up our treatments. That year we had three separate KTREX camps burning simultaneously out of Sawyers Bar, Orleans, and Happy Camp as part of one of the first ever locally organized Type 3 Incident Management Teams. Over a decade of previous political organizing allowed us to get burn permits despite the fact that wildfires were concurrently wiping towns off the map in Sonoma County at the time, and we were in Red Flag conditions the day before and after the burn. We burned from 6pm to 7am the next morning, starting from the top and working down to the bottom, reading the fuels and adjusting to strip and dot firing accordingly. Some places hardly burned. Others so hot it felt like my face was going to melt off standing 50 feet away.

For some, using fire as the primary treatment tool after a century of fuel buildup is simply a bad idea. During the formation of the Western Klamath Restoration Partnership (WGRP) in 2013 and 2014, field tours with diverse participants often stuck on this topic. Foresters in particular thought it unconscionable to burn up merchantable timber. Some Tribal folks were not keen on potential impacts to legacy trees weakened already by encroaching Douglas-firs. These trees, after all, have been tended by Karuk people for generations, and the relationships formed are not easily grasped by well-wishing non-native folks like me. And soil scientists were deeply concerned about erosion.

We were all confronted with the fact that the Klamath Mountains are so rugged, there are places that are too steep to ever log or even run a chainsaw, and fire would inevitably come to these areas, too often at the worst time. Fisheries scientists who had been working to decommission logging roads for decades, and also were seeing a lack of spawning gravel in streams where fire had been long absent, wanted to see if prescribed fire, the blunt tool that it is, could achieve our shared goals. So while we continued planning manual



Aerial drone image from 2019 showing canopy mortality.
By Christopher Weinstein, Karuk Tribe DNR

and mechanical fuels treatments on most burn units, we began to set up a few units like West Simms where the only pre-treatment was just enough of a perimeter cut and pile treatment (in this case 100 feet) to prevent an escape. We set out to learn together what was possible.

The West Simms burn plan allowed for 30% canopy mortality (15% is the norm), and in the years that followed the 2015 burn, it is possible we got close to that threshold. Drone

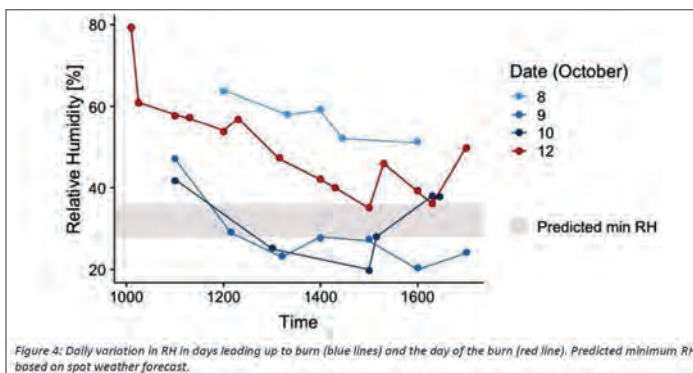


Figure 4: Daily variation in RH in days leading up to burn (blue lines) and the day of the burn (red line). Predicted minimum RH based on spot weather forecast.

Graph of Fire Weather Variables Before and During the 2019 West Simms Burn. Created by Heather Rickard, Pirish Plants Division Coordinator, and Chris Root, MKWC

imagery showed we achieved our goal of top killing young Douglas-fir stands that had come up in the riparian meadows and oak woodlands, while little canopy mortality occurred in the late seral Douglas-fir and madrone forests on the north and south edges of the unit. By 2019, when we began prepping for our second burn entry, these young Douglas-fir snags were starting to fall, subsumed by a sea of blackberries once again fed by sunlight. We knew if we waited for all the snags to come down, the next burn would cause more impact to the legacy trees that grew up before the era of fire exclusion. By reducing the jackpots of fuels that were starting to form, and knocking back the blackberries, we could also keep the forest open for the elk that came out of the high country into the Orleans Valley to eat the browse created from the 2015 burn.

This second 2019 burn highlighted the importance of variables like relative humidity, fuel moisture, temperature, wind, topography and aspect in achieving our burn objectives. 0.2 inches of rain had fallen a week prior to the 2019 Klamath TREX, however a predicted Red Flag event with dry east winds gave us a perfect window to burn. The unit was shielded from the east wind by Black Mountain, but the low humidity would dry the fine fuels enough to carry the fire into the jackpots of

downed trees. Unfortunately, CAL FIRE North Region after the Camp Fire was no longer in the business of issuing burn permits during Red Flag conditions, so we had to wait several days to burn and were unable to get fire to carry through most of the unit. The graph below shows conditions on the unit during the Red Flag event, and after when we implemented the burn. Data like this helps build the case for CAL FIRE to take into account local variables when deciding whether or not to issue burn permits.



Fall 2022 Klamath TREX Burn at West Simms *By Will Harling*

**Everything we need to live is here. Hope,
for restoring our relationship to fire,
for cultural revitalization, for humanity, is here.**

Over the next couple years, Klamath TREX priorities shifted to focus on burning units that would provide basket materials for Karuk basketweavers, protect tan oak acorn gathering areas, and provide defensible space in the wake of the 2020 Slater Fire and 2021 McCash Fire. In this time most of the remaining dead standing trees fell down and the blackberries became even more impenetrable to the point where elk (and humans) were excluded from most of the unit. In preparation for our burn during the 2022 Klamath TREX, the firing team devised a novel plan to create vertical personnel lines (p-lines, or trails) down the slope through the dense fuels, and use incendiary devices, both hand held and propelled, to keep the fire level as we brought it down the mountain. These p-lines show up in green on the unit map in Figure 1.

In the densest patches of downed fuels, fire effects monitors documented 40-80 foot scorch heights as heat and flames were funneled through openings in the canopy. In other areas the fire backed through blackberries, oak woodlands, and grass patches at much lower intensity. Minimal wind, low fuel moisture, and higher humidity levels created a stable burn window where fire could be moderated by ignition patterns outside of the jackpot areas where fuel loading overpowered all other variables. The Fall 2022 KTREX burn at West Simms took place over two days, from October 14-15, with a tactical pause from midnight the first day to 2pm on the second day. During this tactical pause, backing fire did a lot of work in the shrub/blackberry fuel type.

A KTREX FEMO report from the 2022 burn notes that it was implemented on the drier end of the prescription, and traditional fire suppression firing tactics caused higher fire intensities which accounted for more impacts to legacy trees. Specifically, it calls out the tactic of burning out unburned bellies of fuel and keeping the line of backing fire even as contributing to higher impacts to legacy trees. The report concluded that a “successful maintenance burn in West Simms may require one or a mix of three things: cooler conditions, even more prep work around legacy trees, or slower paced firing.”

Recent field trips in March and April of this year with members of the KTREX burn team and leadership are helping to guide future entries, and create a shared understanding of the complexities at play as we experiment with restoring pre-contact forest structure with the blunt tool of prescribed fire. There is broad agreement to expand the burning period over as many days as possible to reduce the speed of ignitions and rely on backing fire and not human ignitions to carry fire through the unit. Too often, we are constrained by permits, budgets,



During and After Photos from Riparian Habitats in the West Simms Unit *By Chris Root, MKWC*

and public opinion from bringing back burning techniques used by humans in this place successfully for millennia. Now that most of the heavy lifting in terms of canopy reduction has been accomplished, frequent burns in different windows based on vegetation types, specific resources, and moisture gradients will help restore the fine grained mosaic of multi-year burn patterns within the unit.

One thing is clear, the West Simms unit was once human habitat. Karuk people tended this place intensively; it is written in the plants that are coming back in, along with the invasives, after these burns. Yerba Buena/Indian Tea/Chimpinisch, soap root, chain fern, hazel, mock orange, and huckleberry to name but a few, all are responding to the sun, to the cleared soil. Robin Wall Kimmerer, in her wonderful book “Braiding Sweetgrass,” spoke of the forest missing her people, a sentiment that permeated the Karuk Women’s TREX last fall, as native women from around the world gathered to bring fire back to ancestral villages on their terms, with intention and gratitude.

Walking through the unit with basketweavers and the Karuk fire crew that led the burn, it is clear that West Simms is becoming human habitat again. Charles “Chuck” Tello, comes up from the creek with a handful of morels and a brilliant smile. Kathy McCovey eyes the soap root and the hazel, passing on the knowledge of her teacher Josephine Peters to wait until after the first full moon in April to harvest. **Pirish Plants Division Coordinator Heather Rickard emphasizes that this work is aimed to benefit native families first and foremost, and although gathering ethics are place-based and complex, they should be considered before harvesting.** We dig blackberries out of a patch of riparian where native grass

seed was sown over the winter, tending a small patch in the sea of blackberry sprouts emerging. But with the fresh growth, our allies the elk are just coming back in as they move upslope from recent burned areas downslope at Tishaniik, and they will do their part to keep this place open.

So much is at stake, but for now, on this gorgeous spring day, I put a little chimpinisch between my cheek and gum, and grub blackberries with my daughter, Rory, who is home for spring break, along with the Karuk and MKWC plants program staff, and a Cal Poly Humboldt class, listening as Kathy McCovey weaves the stories of this place into a way of living, a way of being. **Everything we need to live is here. Hope, for restoring our relationship to fire, for cultural revitalization, for humanity, is here.**



Will Harling and daughter Rory grubbing blackberries at West Simms. *By Heather Rickard*

Returning Good Fire: Community Engagement is Key

By Nancy Bailey

Everybody can get behind defensible space and roadside fuels reduction work. Clearing the brush or mowing the grass right next to our homes is obviously a good idea. But what about prescribed fire? The attitudes toward putting fire on the ground intentionally are widely varied, reflecting diverse perceptions of the mid Klamath residents!

Still, compared to many places in this country, this community has had a good head-start in a common understanding of living with fire, including the facts that wildfire caused by lightning in the high terrain is here to stay and that intentional and cultural fire can be used as a tool for forest management. Because of the strong Tribal ancestral roots here, the use of fire for enhancing and maintaining cultural resources and renewing the landscape runs deep in the ethos of the community. Generations of early settlers also used fire extensively. Additionally, most all residents understand that the decades of full fire suppression have led to a dangerous situation. We also are aware that the development and building of homes mid-slope, rather than the creek and riverside villages and homesteads historically low in the terrain, adds complexity to our fire environment. As does utility infrastructure. Miles of utility easements clogged with brushy vegetation combined with the ignition potential of the equipment itself represent frightening increased risks.

Many of us have had wildfire experiences up close and personal. Some have lost everything. Others have lived through weeks of wildfire threatening our homes and neighborhoods. All of us breathe smoke each summer due to nearby wildfires.

In spite of a shared understanding of both the historical use of fire and the current increased fire risk, there are divided opinions about whether using prescribed fire is appropriate in the circumstances now, which are so very different than a hundred years ago. Fuel build-up, years of drought, and climate change have all altered the landscape and made prescribed burns more complex. Instances in the past, of hasty and destructive use of fire in “backburn” activities during suppression eroded trust from the community. **But none of this alters the fact that for the health and resilience of our forests and communities, we need regular periodic fire to return.** Certainly, it is true that not every need for fuels treatment necessarily means the need for fire. That understanding helps us put fire where it is needed, safe, and appropriate. It is a nuanced and inexact science but the more we do it the more efficient and safe it becomes. Increased and extensive monitoring of previous burns is helping to inform this movement.



At neighborhood meetings, residents were able to study maps and dive deep about specific fire hazards and treatment priorities right where they live. *By Jodie Pixley*

Here in the mid Klamath, we also have a head-start with community engagement which is the heart and soul of fire safety and fire resilience. Being so remote, residents already depend on each other. Family ties among the Tribal and long-term settler populations are strong and loyal. Difficulties with infrastructure, including common power outages, closed roads, etc., and our lack of outside services have sustained a built-in interdependence over the years. In Orleans and Somes Bar, the Community Liaison Program (OSB CLP) has enhanced this small-town characteristic by providing a network and structure for communication during wildfire emergencies and other crises. Liaisons reach out to neighbors to exchange needed information and have a conduit to pass fire information to wildfire managers. The CLP was used during the early Covid days, during the 2021 McCash Fire, and is activated when we need to notify folks of prescribed burns that may impact them.

Residents and landowners have recently stepped up to offer input for wildfire protection planning, as part of the update process of the Orleans/Somes Bar Community Wildfire Protection Plan (OSB CWPP). Through the fall and winter 2022-2023, over eighty community members participated in lively neighborhood meetings during which participants provided important information regarding water sources and fire risks specific to their neighborhoods. Participants’ discussions and input on fire suppression, the CLP, priority projects, cross boundary burns and other concerns will inform the OSB CWPP (Community Wildfire



Residents hear from Bill Tripp at the community CWPP meeting about the current state of fuels management locally, regionally, and nationally.

Protection Plan) update and in every case, served to enhance neighborhood cohesion. The Happy Camp CWPP is also in its final stage of being updated since the 2020 Slater Fire. Both CWPPs highlight the potential use of prescribed fire along with other fuels treatments while specifying and prioritizing fuels projects in areas and neighborhoods that are at highest risk. Community members are invited and encouraged to become familiar with their CWPP and give input during regular update processes. The updated Happy Camp CWPP will be ratified soon and the Orleans/Somes Bar CWPP update process is in full swing, due to be signed in early 2024. Both CWPPs are located on the MKWC website: www.mkwc.org/resources#resources-fire-forestry

Since the Orleans/Somes Bar Fire Safe Council’s first informal prescribed burn in 2001, MKWC and the Karuk Tribe have accomplished thousands of acres of successful prescribed fire, from Bluff Creek to Seiad. This is getting people used to the idea of more frequent fire and spurring landowners to get on waiting lists for yearly controlled burning. They see the obvious advantages and efficiencies of it. Through landowner participation and excitement about successful fuels treatments near homes and along roads, on private and Tribal properties, relationships are being built and sustained.

But, putting fire here and there throughout the landscape one or two times a year falls short of the full remedy needed. Through the collaborative management of the Western Klamath Restoration Partnership (WGRP: www.wgrp.network), we are moving toward landscape-scale fire on public land. On private land, the more neighbors agree on what the fire risks are, the more willing they are to work together, and with MKWC and the Tribe, toward wildfire protection and fuels treatments across boundaries at the neighborhood and landscape scale.

Besides community support and engagement, policy changes at the top and evolving attitudes among U.S. Forest Service and CAL FIRE leadership are also essential for actual implementation to take place. While it may seem a long time coming, these changes are finally occurring though permitting pinch points still strangle prescribed fire activities.

With the policy shifts at the top, increased capacity and skill of local practitioners, and the growing involvement and support of the local community, we are in good shape as we enter a new era of *Returning Good Fire*.



Landowners discuss project priorities with MKWC staff at February CWPP community meeting. Input is informing the CWPP update. All photos this page by Nancy Bailey

Chipper Days!

April 20th, 2023—The MKWC Fire and Forestry (F&F) program conducted a mandatory training day for the safe use and operation of our new Morbark 1621x chipper. This amazing new piece of equipment was funded in part by a USDA “Rural Development Grant” and will assist the F&F program with hazardous fuels reduction projects in our communities, rural properties, and on National Forest lands.

If you are interested in chipping work being done at your property and to learn more please visit mkwc.org, Fire and Forestry program.

Free Roadside Chipping in Orleans June 30th, contact Nancy Bailey, nancy@mkwc.org to sign up. Free chipping in July in Happy Camp Date: TBD.

Here is a link to request assistance for fuels reduction projects: www.mkwc.org/fire-forestry



Preparing this important recreation area for spring opening, MKWC Fire & Forestry staff attended a mandatory chipper training, conducted at the Curly Jack Campground, in collaboration with Klamath National Forest.



The Blakesley property near Happy Camp before (left) and after (right) fuels reduction. By Michael Hentz

UPCOMING
SPRING/SUMMER

VOLUNTEER DAY SCHEDULE

Stay tuned for more details and additional events each month.



JUNE

Friday, June 9

Raft and pull weeds from river bars along the Klamath River near Happy Camp. Direct questions to Tai Kim (taikim@mkwc.org).



JULY

Friday, July 7

Enhance fish habitat along the Klamath River near Orleans. Direct questions to Maya Williams (mayawilliams@mkwc.org).



AUGUST

Friday, August 18

Build and maintain Beaver Dam Analogs to increase fish habitat. Direct questions to Carol Earnest (carol@mkwc.org).



Volunteer days this year are brought to you by the Mid Klamath Watershed Council (MKWC) and Karuk Tribe DNR with additional support from the National Forest Foundation, US Forest Service, community contributions, and most importantly by volunteers like YOU!



Policy Shifts in California Address Barriers to Scaling Up Prescribed and Cultural Burning

By Will Harling

WKRP partners have been pushing to expand cultural and prescribed fire in the Western Klamath Mountains for several decades, and have encountered significant barriers along the way. These barriers include liability and insurance, permitting, funding, workforce, and qualifications, to name a few! After trying to make change at the local level for over a decade, the Karuk Tribe formed the Karuk Fire Policy group for the purpose of revising state law and policy to support needed increases in prescribed and cultural fire. In February 2021, this group published the Good Fire Report that outlined key problems and solutions to expanding beneficial fire in California. (karukTribeclimatechangeprojects.com/good-fire).

Since then, many of the changes outlined in this report have become California law and policy. These include Senate Bill 332, passed in 2021, which changed the state's liability standard to say that prescribed and cultural practitioners would only be responsible for suppression costs if they could be shown to have been grossly negligent in their burning. In other words, if burners are employing best management practices, have the appropriate permits, and are burning for the public good, they will not be held liable for suppression costs related to escaped burns. Additionally, SB 332 defined terms related to cultural burning, and gives cultural practitioners the same level of protection as state-certified burn bosses.

Adding to this, Senate Bill 926, passed in the Fall of 2022, created a state backed prescribed fire claims fund that allocated \$20 million (up to \$2 million per applicant) to cover the cost of claims against prescribed and cultural burners for losses associated with escaped burns. This pilot claims fund is scheduled to go live in May 2023. MKWC Director Will Harling and other Karuk Fire Policy Group members participated in the CAL FIRE working group that created the terms and conditions of this fund, ensuring it will serve our local efforts to protect our prescribed and cultural fire practitioners.

To streamline the burn permitting process, CAL FIRE launched a new Online Burn Permit app at burnpermit.fire.ca.gov. This new platform offers the public a user-friendly way to request a burn permit for residential hazard reduction, larger broadcast burning projects, cultural burning, agricultural burning projects, and agency supported fuel reduction burning projects. The permits are for projects that are located within the State Responsibility Areas and other jurisdictions



Nick Goulette, Executive Director, Watershed Research and Training Center, Lenya Quinn-Davidson, UC Cooperative Extension Fire Advisor, Bill Tripp, Executive Director, Karuk Department of Natural Resources, and Will Harling, Director, Mid Klamath Watershed Council at the State Capitol building. *By Stranger on the Street*

where CAL FIRE has authority to require them. The public can now fill out the application forms from their computer or smart device, anywhere they have internet access. Once the application is submitted, a CAL FIRE representative will review and process the information. If a site visit is required, the Department representative will schedule a time with the applicant and move the project forward.

Finally, California is putting its money where its mouth is, providing \$17 million in Forest Health grant funding since 2018 for WKRP partners to implement manual, mechanical, and prescribed burn treatments, train and build crews, and purchase the supplies and equipment needed to implement these treatments. Together, these actions are enabling us to scale up treatments in the 1.2 million acre WKRP planning area, and match federal funding for WKRP from the Collaborative Forest Landscape Restoration Program (CFLRP), the Bipartisan Infrastructure Law, and the Inflation Reduction Act, which cumulatively bring over \$50 million in federal funding to the Klamath Mountains for proactive treatments. It will take diverse partners coming together to make the most of this moment in history, restoring fire process from the communities out. We have accomplished so much to get here, and there is still a lot of hard work ahead!

Black Oak Restoration

by Luna Latimer

The first time I remember killing the big, beautiful black oak trees that we were trying to protect and restore was at a prescribed burn north of Somes Bar in 2006. It was a small prescribed burn, including a meadow. It was a beautiful day. It was the first time I had seen a flying squirrel up close and personal as we rescued it from the fireline. Despite the traumatic experience for the squirrel, I thought everything had gone as planned and we were meeting all of the objectives of the burn. It was during a follow up visit that I saw the downed trees. After the burn, several of the big black oaks had fallen over. There was no sign that there had been any burning around the bole of the tree, yet the tree had hollowed out and fallen over—most likely having embers enter the tree from a rotten knot hole then burning from the inside out over the next couple of days until there was nothing left to keep the tree standing.

Fast forward 15 years, and I, and many others, are still working to protect and restore big black oaks. As the Western Klamath



Black Oak tree with regrowth
All photos this article by Luna Latimer, unless noted



A Black oak in the Ikkariyatuuysip Unique Prescriptive Area still hanging on with a hack and squirt herbicide scar.

Restoration Partnership (WKRK) moves forward with black oak restoration in the Ikkariyatuuysip project near Somes Bar, I am continually humbled by the experience. There are some big black oaks in the area (despite the Forest Service's best efforts to eradicate them starting in the 1950's (*General Technical Report PSW-81*) using "hack and squirt" herbicide methods. However, these trees are barely hanging on and rapidly toppling over during wind and storm events.

I think that one of the reasons why "burnout" is so common among the restoration workforce is that we see the loss of what we are trying to restore at such a rapid pace. Our slow, bureaucratic response is no match. We want to move faster and do more, but it is never fast enough no matter how many hours we toil away at our jobs. We are paying the debt of the

past century of management and it will take another century, or even many centuries, to dig ourselves out of the situation. There is a part of the Ikkariyatuyship project that I think of as the “Sad Place.” It is part of the mature black oak unique prescriptive area. The whole purpose of this part of the project is to restore conditions in which black oaks can thrive, and work to retain the remaining black oaks on this part of the landscape. In the Sad Place, the carcasses of the oaks are on the forest floor—giving out after decades of gasping for light. And this is where the humbling experience of being a short-lived human trying to be a responsible steward of the landscape continues. There is no argument that the black oaks need more light. Black oaks grow throughout California. In this part of the Klamath Mountains, black oaks have thrived under cultural management and cultural fire practices that kept stands open and kept Douglas-fir from shading out the oaks. These dead black oaks are a symbol of the U.S. government’s exclusion of Karuk people from land management. Restoring black oaks is symbolic of Tribal sovereignty and the retention of Tribal rights. Like all ecosystem management, it isn’t just about the trees, it is about the human relationship with the trees.

So how do we restore black oaks? We all agree that black oaks need light. If we thin the trees around the black oaks too heavily, they may get knocked down during the logging process, be blown over in the next wind event (without the protection of the surrounding trees), or die in the next wildfire or prescribed fire (as many of us fire practitioners have learned). WKRP is engaging with Oregon State University and Cal Poly Humboldt professors and students, along with the usual WKRP partners, to design experiments to more rapidly identify factors that can contribute to our restoration success. What actions, and in what sequence are most likely going to lead to success? How do we scale up from this one project to a whole landscape? What



Black Oak photo taken during a burn by the Yurok Cultural Fire Management Council By Joe Hostler



A rare black oak seedling in the Ikkariyatuyship project. Lack of light makes the path to maturity very difficult.

is feasible? How can we not make things worse while trying to make things better for the black oaks?.

In addition to this planned research, there are a lot of natural experiments taking place in the Western Klamath Mountains. This heavy snow year will inevitably lead to broken out tops of black oak. The photo below shows the black oak in my yard and the regrowth of the black oak following the top falling out in 2017. With full light, the black oak has recovered nicely and is full of regrowth.

Undoubtedly, the PG&E Enhanced Vegetation Management will lead to all sorts of natural experiments with black oaks as trees are topped along the lines and more light is available to the oaks. Do you have a black oak experience to report? Let us know! We welcome any black-oak-related photos. Send emails to mail@wkrp.network.



2021 Yurok TREX By Will Harling



Jeremy Bailey, North America Fire Director, Prescribed Fire Training, of the Nature Conservancy helping with 2022 Cultural Fire Management Council burn By Will Harling

The Slater Fire in Happy Camp is also a natural experiment for black oaks. During initial visits, the most dominant vegetation I could see were Oregon grape and black oak. The conditions under which the next fire burns in the Slater Fire footprint will largely dictate the type of vegetation that grows there for decades to come. WKRP is prioritizing re-application of prescribed and cultural fire in the Slater Fire footprint during this critical window, hoping to create conditions under which black oak woodlands can thrive. It was active stewardship by Indigenous peoples that led to black oak dominance in California (*Stephens et al. 2023*) and it will take active stewardship to restore them.

One of my favorite aphorisms is: “the best is the enemy of the good.” We may not know precisely all of the best actions, in the right sequence, in all of the places on the landscape, but it is good that we are doing something—especially if we are learning from those actions. I think that losing a few black oaks during a prescribed fire is a better alternative to the Sad Place—even if it hurts my heart to see any legacy oaks die after a fire. The lifespan of humans is insignificant compared to the lifespan of oaks and the forest. What are our indicators that we’re on the right path? We need to be in the forest to see the consequences of our actions. We need to be constantly monitoring the results of our actions. In order to do that, we not only have to restore the trees, but human relationships with the trees. WKRP is re-doubling its efforts to adaptive learning through fieldtrips to past burn areas. Check out Will Harling’s article about the recent West Simms fieldtrip on page 13. I look forward to keeping you informed of what we find out there in this multi-generational effort to restore oak woodlands.

Check out this Karuk Pikyav Lecture Series, from May 3, 2023, on Xánthiip (Black Oak) Ecocultural Stewardship with Jessie Thoreson for more information on Black Oak Restoration: <https://vimeo.com/824162719>



Quercus kelloggii acorns
From blackoaknaturalist.blogspot.com

Place-Based Restoration

By Susan Prichard, PhD, NERA Lab, University of Washington, Co-author Skye Greenler, PhD, Oregon State University

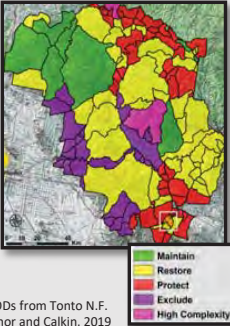
Place-Based Restoration of Resilient Landscapes in the Western Klamath Mountains

Phase 1 (NCRP Funding 2020-2021)

Potential Wildfire Operations Delineations (PODs)

Build PODS

- Values at risk
- Potential control locations
- Burn probabilities
- Suppression difficulty
- Firefighter safety
- Fire consequences




Example PODs from Tonto N.F. See: O'Connor and Calkin, 2019

REBURN Simulation Modeling

Assemble datasets and base models

- Ignition data (cultural, lightning)
- Vegetation, fuels, topography
- State and Transition Modeling (STM)



In this project, we are developing two complementary approaches to inform restoration of fire and landscape resilience in the western Klamath Mountains. Recent wildfires in Northern California have been uncharacteristically large, high severity events that have threatened communities, cultural resources, and ecological values. To avert further impacts, there is an urgent need for proactive measures to strategically plan for corralling and harnessing future wildfire events and restoring the role of beneficial fire to the region.

Given the place-based knowledge of cultural burning practices and diverse ecology of this region, we have an extraordinary opportunity to collaboratively plan for climate change and future wildfires. In **Phase 1**, we initiate two processes:

- ✓ We first develop Potential Wildfire Operational Delineations (**PODs**) across the California North Coast Region. PODS allow fire managers and stakeholders to: identify natural and cultural resource values throughout the landscape; pre-plan anchor and control points for future wildfire response; and collaboratively weigh trade-offs between burn probabilities, suppression difficulty, potential fire severity, and firefighter safety.
- ✓ **REBURN** simulation modeling enables us to reconstruct the historical role of fire in the study area and compare wildfire management scenarios designed within the PODS framework. In **Phase 1**, we develop a REBURN model specific to the Western Klamath region. This includes (1) assembling historical ignition, weather, fuels, and vegetation data to represent vegetation and fuel characteristics and reburn pathways of a representative large landscape, and (2) incorporating tribal knowledge and practices, indigenous histories, and historical datasets to reconstruct a cultural fire regime that reflects both lightning and cultural ignition patterns, timing, and locations on the landscape. This integration will allow us to better understand how coupled human-natural systems shaped the landscape over millennia, and how that knowledge can be leveraged to shape future forest conditions that are climate and wildfire adapted. Tuning the model to ensure it properly represents landscape processes under different conditions will involve work planned in **Phase 2**.

O'Connor & Calkin, 2019. Engaging the fire before it starts: A case study from the 2017 Pinal Fire (Arizona). *Wildfire*. 28(1): 14-18.

Place-Based Restoration of Resilient Landscapes in the Western Klamath Mountains

Phase 2 (pending funding)

Potential Wildfire Operations Delineations (PODs)

Implement PODS

- Work with local managers on wildland fire management planning
- Prioritize restoration and fuel treatments
- Inform wildland fire use strategies



REBURN Simulation Modeling

Reconstruct historical landscapes

- Aerial & oblique photos
- Indigenous knowledge
- Cultural fire history
- Fire history studies & cohort analysis

Spin up and calibrate REBURN model



Place-Based Restoration of Resilient Landscapes in the Western Klamath Mountains

Phase 3 (pending funding)

Evaluate Wildland Fire Management Scenarios

- Test scenarios within the PODS with the REBURN model to:
- Evaluate
 - Restoring fire through cultural burning practices
 - Managing unplanned ignitions
 - Wildfire management alternatives
- Assess tradeoffs
 - Consequences of fire exclusion for summer wildfires
 - When is there too much fire?
 - Smoke production from modern fire suppression vs. restoring the role of fire
- Examine implications for
 - Adapting to climate change, fish and wildlife habitat
 - Carbon sequestration, hydrology, and wildfire emissions



WEEDING WITH MKWC

Making a Difference on the Ground

By Tanya Chapple

For invasive plants work the difference isn't what we see, it's what we don't. For MKWC's Plants Program, restoration involves removing plants in the least obtrusive way possible. We uproot weeds with digging bars to minimize ground disturbance and avoid damage to surrounding plants. You might notice just after we've been somewhere, trampled ground and scattered small piles of plants. But, if we're doing our job well, you wouldn't notice much. We focus on early detection and rapid response to invasive weeds, this means we work to remove harmful plants that are new to our area, and remove them quickly, keeping at it until they are gone.

MKWC, along with partners, have emphasized weeds work like this across the Middle Klamath for decades. We've been to many hundreds of places, looking for prioritized weeds in land-disturbed areas like river corridors, burned areas, and roadsides. Sometimes just one plant is found, pulled, and never seen there again. More often we find a small patch, and end up spending many consecutive growth seasons weeding these spots, until eventually they are gone. This is a long game, seeds can live in the soil for many years, sometimes decades.

I'm going to tell a story of one of our weeds sites that demonstrates early detection and rapid response, disturbance associations, natural recovery, and where preventative moves could have been made.

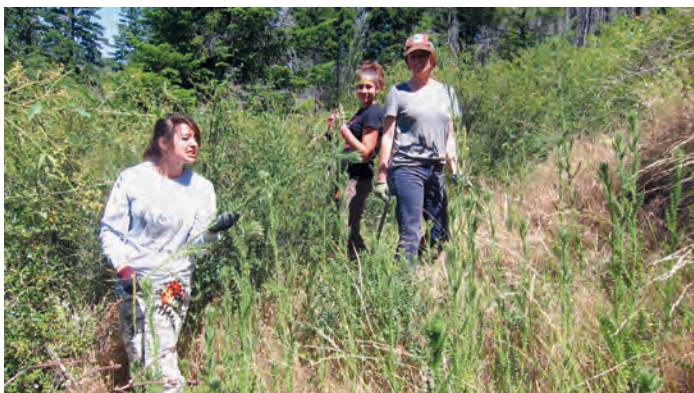
This is giant plumeless thistle, *Carduus acanthoides* (right). There is only one known location of this listed noxious weed in Siskiyou County. Lauren Alvarado and I found this site on August 20, 2009, when we were surveying the 2008 Siskiyou Complex Fire area for weeds. It was one of our last field days for the season and we were checking the spur roads in the vicinity of Dillon Mountain. We bumped down a road and at the end was a very tall, very new to us, thistle, puffing out seeds.



Plumeless thistle, *Carduus acanthoides* Photo by Tanya Chapple, 2009

This thistle didn't come in with the fire suppression effort, it had been there for a while. The road ended in a landing in the center of a clearcut. I recall that a plantation card there indicated that the trees had been planted in the mid-1990s. The thistles were most dense near a gravel pile, material that had likely been brought in for the road or landing.

We did what we could about the thistle that first year, we'd already missed the optimal time, they were seeding, and we had to be cautious about the risk of spreading it around ourselves. We pulled the plants in a half acre area, and planned to return in July of 2010. The next year MKWC's weeds and youth crews worked with the Happy Camp Ranger District youth crew led by Michael Hentz and Erin Rentz to remove all the plumeless thistle. The site was large, blooming thistle plants were throughout the uphill side of the clearcut, approximately four acres. We removed 12,000 plants over three visits. Plumeless thistle is a wind-spread, biennial species, in 2011 the site area increased to 10 acres, those seeds from 2009 had blown into the



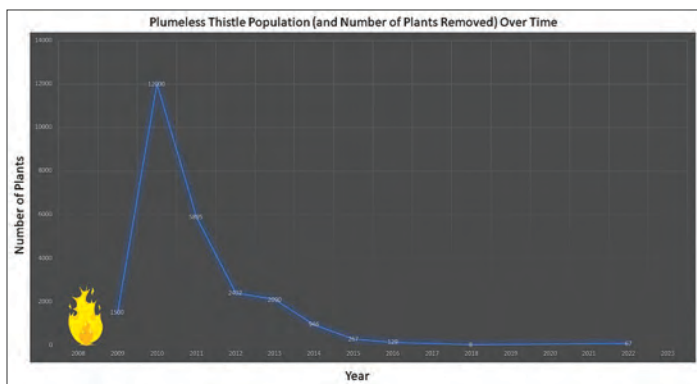
MKWC youth crew removes thistle in 2014. Photo by Tanya Chapple



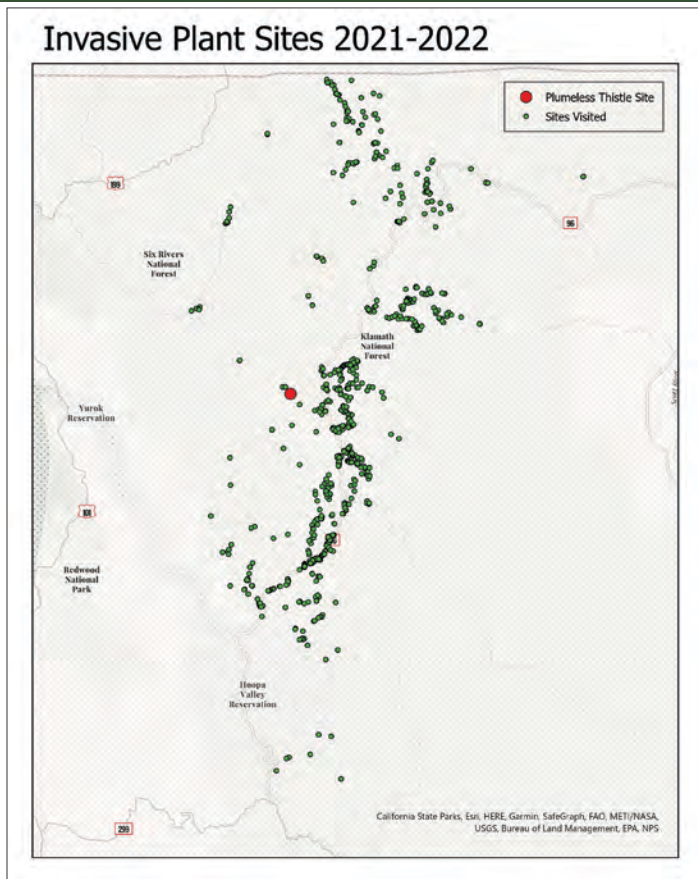
Nathan Donnelly removes plumeless thistle in 2009.
 Photo by Tanya Chapple

forested area and by 2011 were very tall, blooming plants. We continued to visit this site annually with our summer youth crew, until the plants became hard to find, and summer field work was complicated by hazardous smoke. The plants became difficult to find due to our continued efforts, and also because the area rapidly recovered from fire, these thistles need plenty of sunlight to thrive and the shrubs had grown tall.

We still find the thistles in grassy open patches between the shrubs and berries. The last time I visited the site was 2018, I remember crawling through the shrubs along bear trails, emerging into openings often around a large burnt stump, and finding one or two thistles, in total we found 8 plants. April and Amber went for the first time since 2018 last year and removed 67 plants, which is a lot compared to 8, but very few compared to 12,000. The population is at a non-threatening



Population change of plumeless thistle near Dillon Mt. from 2009 to present



state, not eradicated, but not very risky. It will likely be many more years before we can call the site eradicated, as this label is reserved for zero plants found for at least three years.

The lessons I take from this example are how fast weeds can spread following a fire, and the difference we can make if we put in the extra effort following such a disturbance. The real question is why and how did this rare weed end up at the end of lonely road, on the side of a lonely mountain. **Prevention is key, if we ensure that our equipment and materials are weed-free, we can truly make a difference in protecting the biodiversity and resilience of the Mid Klamath.**



Elben taking out Dyer's woad/Marlahan mustard on Ukonom Mt.
 Photo by Amanaka Yancey

Almost There! Orleans MKWC Office Remodel

By Michael Stearns

After years of planning and fundraising, MKWC is nearing the end of its office remodel project. Back in 2017, KJ Construction repaired and improved our roof and built a new covered front porch. With the leaks stopped we began to plan for other improvements. Now KJ Construction has built us new offices that we will move into this May. We will now have windows that actually open, a heating and air conditioning system, and a sound-insulated wall with separate entrances between our offices and the community space.

After we move into our new offices, we will remove the old offices leaving a large community space with views from the front to the back, all the way to the Klamath River. We hope to

finish the renovation of the building over the next two years as we continue to work on the building: removing rot, installing new windows and siding, building ADA compliant bathrooms, and a new kitchen. Our tenant, the post office, will receive the same improvements. The community room will get new flooring, walls, ceiling, insulation, and other improvements. Even as we upgrade, we plan to make the community room available for events. Our separated office space will allow the community space to be open during work hours.

To schedule an event please contact blythe@mkwc.org or call 530-627-3202 to inquire as to availability.



KJ Construction pouring footing for the new back deck.
By Michael Stearns



MKWC Office remodel in progress. By Carol Earnest



Many thanks to KJ Construction, who have been doing a great job on the remodel! By Blythe Reis



The MKWC office remodel on May 1st, 2023—almost there!
By Jamie Darragh

Admin Department Brief

In 2022...

69 people employed

Of these 69 jobs, 5 were local youth interns.

73 awards received

Managed and administered by our team.

49 contracts executed

88% of the contracts were to local contractors.

\$3.98 million into the community

Paid in wages to our local workforce and to contractors for services.

Update from the MKWC Justice, Equity, Diversity, and Inclusion Committee

MKWC Staff and Board have been prioritizing the advancement of Justice, Equity, Diversity, and Inclusion (JEDI) within our organization's work. Since the JEDI committee's inception in 2021, we have formalized a budget for ongoing JEDI work and examined MKWC's communications, fundraising, hiring

& onboarding practices, events, and general operations to identify barriers, including systemic barriers, related to historically marginalized groups. Specific measures taken include: revising our annual employee evaluation process to increase communication about professional advancement; offering trainings to promote cultural sensitivity, non-violent communication, and workforce development; continuing payment of an annual honor tax to the Karuk Tribe; updated mechanisms to report harassment; changing the hiring and onboarding procedures to ensure consistency and communication; and regular acknowledgements of cultural heritage and identity months and days.

Further, staff elected to use Giving Tuesday to engage our supporters in fundraising for a local, Indigenous-led cause, the Endowment for Ecocultural Revitalization.

We are committed to the work necessary to make ongoing progress towards our goals, and are using an annual organizational assessment completed by staff and board members as one way to measure success.

Get in touch with the committee at jedi@mkwc.org.



MKWC Staff and Board Retreat February 2022 at Otter Bar Lodge
By Michael Hentz

Directors

Will Harling, *Director*

Luna Latimer, *Director*

Carol Earnest, *Associate Director,
Community & Stewardship Director*

Administrative Staff

Myanna Nielsen, *Administrative Director*

Michael Stearns, *Human Resources Director,
Grants Administrator, Building Coordinator*

Heather Campbell, *Senior Grants Administrator*

Beverly Yip, *Accounts Payable Specialist*

Lesli Dahl, *Grants Administrator, Payroll Specialist*

Blythe Reis, *Administrator, Contracts Specialist*

Mark Dondero, *Grants Administrator*

Jamie Darragh, *Administrative Assistant*

Erin Cadwell, *Information Technology Project Coordinator*

Pamela Ward, *Panamnik Building Custodian*

Community & Stewardship

Tai Kim, *Community & Stewardship Project Coordinator,
Fisheries Field Technician*

Maya Williams, *Community & Stewardship
Project Coordinator, Plants Field Technician*

Bridgett Harrison, *Youth Stewardship Intern*

Beecher Robbi, *Youth Stewardship Intern*

Eva Pearlingi, *Youth Stewardship Intern*

Vinn Morales, *Youth Stewardship Intern*

Aaron Ryan Pole, *Youth Stewardship Intern*

Fisheries

Charles Wickman, *Fisheries Program Co-Director*

Mitzi Wickman, *Fisheries Senior Project Coordinator,
GIS Specialist*

Jimmy Peterson, *Fisheries Monitoring Program Coordinator,
Fisheries Project Coordinator*

Rachel Krasner, *Fisheries Project Coordinator,
Senior Field Technician*

Devin Finegan, *Fisheries Crew Leader,
Fisheries Field Technician*

Florance Condos, *Fisheries Senior Field Technician*

Bryan Souza, *Fisheries Field Technician*

Hollis Baldwin, *Fisheries Field Technician*

Kai Crockett, *Fisheries Field Technician*

Fire & Forestry

Eric Darragh, *Fire & Forestry Co-Director*

Eric Nelson, *Fire & Forestry Project Coordinator*

Chris Root, *Fire & Forestry Project Coordinator*

Michael Max Hentz, *Fire & Forestry
and Fisheries Project Coordinator*

Nancy Bailey, *Fire & Forestry Project Coordinator*

Jodie Pixley, *Western Klamath Restoration Partnership
(WKRK) Project Coordinator*

Danny Davis, *Fire & Forestry Crew Leader*

Clifton Whitehouse, *Fire & Forestry Crew Leader*

Ron Risling, *Contractor Supervisor,
Fire & Forestry Field Technician*

Lee Anderson, *Fire & Forestry Field Technician*

William Manzo, *Fire & Forestry Field Technician*

Silas Yamamoto, *Fire & Forestry Field Technician*

Spencer Bentley, *Fire & Forestry Field Technician*

Hayden Dasher, *Fire & Forestry Field Technician*

Lewis Olson, *Fire & Forestry Field Technician*

Miguel Gallegos, *Fire & Forestry Field Technician*

Dennis Whitehouse, *Fire & Forestry Field Technician*

Rudy Galindo, *Fire & Forestry Senior Field Technician*

Ariel Erickson, *Fire & Forestry Field Technician*

Terrance McCovey, *Fire & Forestry Field Technician*

Daniel Farris, *Fire & Forestry Equipment Operator*

Plants

Tanya Chapple, *Plants Program Director*

Elben Andrews, *Plants Project Coordinator,
Fisheries Field Technician*

Dylan Fitzwater, *Plants Field Technician,
Fisheries Field Technician*

Amber McVicar, *Plants Field Technician*

Sarah Prukop, *Plants Field Technician,
Fisheries Field Technician*

Peter Gensaw, *Plants Field Technician*

April Jordan, *Plants Field Technician*

Teri Chanturay, *Plants Field Technician*

Board of Directors

Heather Foust, *President*

Dean Davis, *Vice President*

Jon Grunbaum, *Secretary*

Molli Myers, *Treasurer*

Mark DuPont, *Board Member*

Jeanerette Jacups-Johnny, *Board Member*

Kathy McCovey, *Board Member*

Blythe Reis, *Board Member*

Carol Sharp, *Board Member*

Michael Stearns, *Board Member*





Mid Klamath Watershed Council

Panamnik Building
38150 Highway 96
PO Box 409
Orleans, CA 95556

Thank you to all the wonderful folks who have supported us over the years. We cannot express how grateful we are for your belief in our work and your commitment to our watershed.

On the Ground Effects of Restoration Table of Content

Community and Stewardship

A Future Without Dams.....	Pages 2
Klamath Adventure Outdoor Series.....	Page 4
Scavenger Hunt.....	Page 5
Looking to the Future: Dam Removal on the Klamath.....	Page 6

Fire and Forestry

Using Prescribed Fire to Restore Pre-Settlement Forest Structure: A Case Study of the West Simms Burn Unit in Orleans, CA	Page 13
Returning Good Fire —Community Engagement is Key	Page 18
Chipper Days.....	Page 20
Policy Shifts in California Address Barriers to Scaling Up Prescribed and Cultural Burning.....	Page 21
Black Oak Restoration.....	Page 22
Place-Based Restoration of Resilient Landscapes in the Western Klamath Mountains.....	Page 25

Fisheries

Making More Fish.....	Page 7
Large Woody Debris is Good for Fish	Page 10

Plants

Weeding with MKWC —Making a Difference on the Ground.....	Page 27
--	---------

Nuts and Bolts

Restoration —Seeing the Difference on the Ground.....	Cover
Volunteer Days	Page 20
Orleans MKWC Office Remodel.....	Page 29
Admin Department Brief.....	Page 31
Update from the MKWC Justice, Equity, Diversity, and Inclusion Committee	Page 30 ^o
Who’s Working at MKWC.....	Page 31



Thanks to the Karuk Tribe, who provided monetary, program, and employee assistance to projects this year.

Newsletter edited by Blythe Reis , with design & layout by Jeri Fergus of Trees Foundation

