



Mattole Watershed NEWS

SUMMER/FALL

2023



ISSUE # 16

MRC Blazes Into a New Era of Ecosystem Restoration

By Hugh McGee, Mattole Restoration Council



Burning piles of Douglas-fir and coyote brush on Prosper Ridge as part of our fuels reduction and grassland restoration. Crews are working on a plan to implement a broadcast burn to maintain restored grasslands. Photograph by Alex Miyagishima

With recent funding from CalFire, the State Coastal Conservancy, the United States Department of Agriculture, and the CA Wildlife Conservation Board, the MRC’s Ecosystem Restoration Program and project partners are beginning implementation of over 1,500 acres of landscape-scale forest and grassland restoration in the Mattole and Eel River watersheds. Below is a summary of all these important projects we will be implementing over the next few years.

Mattole Forest Resilience Training

With the extensive amount of restoration work ahead of us over the next decade, having a highly trained local workforce is essential to completing our forest and grassland restoration projects.

Our field crews and contractors are the backbone of this organization and without them it would be impossible to complete all this work. Our CalFire Wood Products Program grant has given us a great opportunity to build local forest restoration and prescribed fire crews and engage with other practitioners from state and federal agencies, tribes, and local volunteer fire departments doing similar work. This grant will allow us to host eight S-212 chainsaw training classes, two Prescribed Fire Training Exchanges (TREX), and over 300 prescribed fire training days that will allow our staff and other practitioners to gain the certifications needed to implement prescribed fire projects. This grant also created a pathway for us to work with The Nature Conservancy, who is sponsoring our prescribed fire training program.

See “Blazing” - continued on page 15

<p>Mattole Restoration Council P.O. Box 160 Petrolia, California 95558</p>	<p>Non-Profit Org U.S. Postage PAID Eureka, CA Permit No. 76</p>
--	--

In this issue...

- Page 3: From the Executive Directors: MRC, SFI, and MSG
- Page 4: Glimmers of Hope for Mattole Salmon Populations
- Page 5: Landscape Conservation in the Mattole River Watershed
- Pages 6-7: Mattole Field Institute: Rivers, Bats, Marine Mammals, oh my!
- Pages 8-9: Mattole Salmon Group in the Estuary: 40 Years of Effort
- Pages 10-11: Keeping it Underground in Lost River
- Pages 12-13: Free Riders and Instream Wood
- Page 14: Rainfall in the Mattole: Timing is Everything
- Page 15: MRC Blazes into a New Era of Ecosystem Restoration
- Page 16: Farewell John McAbery

Mattole Restoration Council

P.O. Box 160 • Petrolia, CA 95558
 Phone: (707) 629-3514
 Fax: (707) 629-3577
 Email: mrc@mattole.org
 Website: www.mattole.org



MATTOLE RESTORATION COUNCIL MISSION

The mission of the Mattole Restoration Council is the restoration of natural systems in the Mattole River watershed and their maintenance at sustainable levels of health and productivity, especially in regards to forests, fisheries, soil, and other plant and animal communities.

MATTOLE RESTORATION COUNCIL VISION

"We look forward to a Mattole that has healthy, self-sustaining, productive forests, meadows, and streams, with abundant native fish and wildlife populations. We envision a community that draws its sustenance from and lives in harmony with the environment. We seek to understand processes of natural healing and enhance them using best land practices in harmony with the local environment. We seek to enhance the exchange of knowledge among all community members toward that goal. We look forward to a time in the Mattole watershed when "restoration" will no longer be needed."

BOARD OF DIRECTORS

Lisa Hintz • Sue Jamison • Jane Lapiner • Loren Miller
 Gary "Fish" Peterson • Rob Roscoe • Monica Scholey
 Edwin Smith • Maria Vollmar

STAFF

Sarah Vroom • Executive Director
 Hugh McGee • Ecosystem Restoration Program Director
 Ali Freedlund • Working Lands and Human Communities Program Director
 Pamela Conn • Accounting Manager & Contracts Manager
 Emily McDonald • Office Manager
 Joseph Sandoval • Prescribed Fire & Forest Restoration Project Coordinator
 Flora Brain • Mattole Field Institute Coordinator
 Christina Cortez • Native Plant Materials Project Coordinator
 Jane Dexter • Native Plant Nursery Assistant
 Michelle Dow • Contracts Manager
 Samuel Keener • Forest Restoration Crew Leader
 Wyatt Leach & Dave Lirning • Assistant Forest Restoration Crew Leaders
 Martin Maskill • Invasive Plant & Revegetation Crew Leader
 Jennifer Gilda • Whale Tail Program Coordinator
 Theresa Vallotton • Nicks Interns and Step Up Project Coordinator
 Colleen Bear Theresa Vallotton • Step Up Project Coordinator
 Miles Kinman • GIS Technician
 Invasive Plants Crew: Hollin DeProspero, Abe Fielding, Jillian French, Chandler Maskill, Mark Randall
 FLASH Technicians: Camillo Stevens, John Summers
 Forest Restoration Crew: Brian Barrick, Kahll Gould-Bayba, Stefan Beckman, Shira Brown, Artur Gautier, Ryan Gonzalez, Bill Leach, Michael Martin, Miles Oliart

Thank You to our Supporters:

Bella Vista Foundation
 Bonneville Foundation
 CA Coastal Commission
 CA Employment Development Dept.
 CA Dept. of Fish and Wildlife
 CA Dept. of Water Resources
 CalFire
 CA Fire Safe Council
 CA Natural Resources Agency
 CA State Coastal Conservancy
 CA State Parks
 CalTrout
 CA Wildlife Conservation Board
 Cal Poly Humboldt
 Cereu Fund of the Trees Foundation
 Coast Central Credit Union
 Conservation Lands Foundation
 Gerald O. & Susan Hansen Family Fund, HAF+WRCF
 Grace US Foundation
 Holdfast Collective
 Humboldt County
 Humboldt County Resource Conservation District
 McLean Foundation
 Natural Resource Conservation Service
 North Coast Resource Partnership
 Pacific Gas and Electric
 Ray and Marie Raphael
 Save the Redwoods League
 The Nature Conservancy
 Tom and Stephanie Perrett Community Fund, HAF+WRCF
 UC Cooperative Extension
 USDA Forest Service
 US Fish and Wildlife Service
 US Bureau of Land Management
 US Dept. of Labor
 MRC Members and Donors
 Participating Landowners

Sanctuary Forest, Inc.

315 Shelter Cove Rd., Ste. #4
 P.O. Box 166, Whitethorn, CA 95589
 Phone: (707) 986-1087
 Fax: (707) 986-1607
 Email: sanctuary@sanctuaryforest.org
 Website: www.sanctuaryforest.org



MISSION STATEMENT

Sanctuary Forest is a land and water trust whose mission is to conserve the Mattole River watershed and surrounding areas for wildlife habitat and aesthetic, spiritual and intrinsic values, in cooperation with our diverse community.

BOARD OF DIRECTORS

Eric Shafer, President
 Betsy Watson, Vice President
 Janice Parakilas, Treasurer
 Rio Anderson, Secretary
 Campbell Thompson
 Stuart Moskowitz
 Victoria Shafer
 Matthew Knoedelseder • David Sopjes
 Rena Lourie • Maddy Riffa • Sandy Miles

STAFF

April Newlander, Executive Director
 Tasha McKee, Water Program Director
 Anna Rogers, Education, Development & Administrative Director
 Ash Brookens, Stewardship Program Coordinator
 Walker Wise, Water Program Coordinator
 Galen Doherty, Lands Program Coordinator
 Anita Pirog, Administrative & Program Assistant
 Janna Pingle, Program Assistant
 Denise Dills, Bookkeeper & Contract Manager

Thank You to our Funders

Bella Vista Foundation
 California Department of Fish and Wildlife
 California Department of Water Resources
 California State Coastal Conservancy
 California Wildlife Conservation Board
 Campbell Foundation
 Conservation Lands Foundation
 Firedoll Foundation
 Grace Us Foundation
 Humboldt and Mendocino Redwood Company
 Land Trust Alliance
 Natural Resources Conservation Service
 Schwemm Family Foundation
 Weeden Foundation
 Sanctuary Forest Donors
 Participating Landowners

Mattole Salmon Group

1890 Lighthouse Road
 P.O. Box 188 • Petrolia, CA 95558
 Phone: (707) 629-3433
 Fax: (707) 629-3433
 Email: msg@mattolesalmon.org
 Website: www.mattolesalmon.org



MATTOLE SALMON GROUP

MISSION

The Mattole Salmon Group works to restore salmon populations to self-sustaining levels in the Mattole watershed.

BOARD OF DIRECTORS

Michael Evenson, President
 David Simpson, Vice President
 Lindsay Merryman, Treasurer
 David Buxbaum
 Michelle Dow
 Ray Lingel
 Campbell Thompson
 Gail Wread

STAFF

Richard Sykes, Executive Director
 Linda Yonts, Bookkeeper
 Josh Madrone, IT Administrator & Project Coordinator
 Campbell Thompson, Project Coordinator
 Nathan Queener, Fisheries Biologist
 Emma Held, Assistant Fisheries Biologist
 Kate Cenci, Project Coordinator

Valued staff with multiple duties:

Sam Arnold
 Thomas Dunklin
 Rich Firebaugh
 Ryan Gonzales
 Roberto Gramajo
 Nick Hayhurst
 Matt Knoedelseder
 Chad Paul
 Zach Poppinga
 Gary "Fish" Peterson
 Jessie Ritchie
 Ali Singh
 Brad Whitt
 Josh York

Thank You to our Funders...

Bella Vista Foundation
 CA Dept. of Fish and Wildlife
 CA Dept. of Water Resources
 California State Coastal Conservancy
 California Wildlife Conservation Board
 Campbell Foundation
 Conservation Lands Foundation
 Firedoll Foundation
 Grace Us Foundation
 Humboldt and Mendocino Redwood Company
 Land Trust Alliance
 Natural Resources Conservation Service
 Schwemm Family Foundation
 Weeden Foundation
 US Bureau of Land Management

MSG Donors

Mattole Watershed News

Published annually by:
 The Mattole Restoration Council, Mattole Salmon Group, and Sanctuary Forest, Inc.

Editing, Layout and Design
 Flora Brain

Contributors

Flora Brain • Ash Brookens • Carol Calhoun • Stephen Dishong • Michael Evenson
 Ali Freedlund • Emma Held • Hugh McGee • Alex Miyagishima • April Newlander
 Janna Pingle • Nathan Queener • Anna Rogers • Stillwater Sciences
 Richard Sykes • Joe Szcwczak • James Vonesh • Sarah Vroom

The contents of this document do not necessarily reflect the views and policies of our funders, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

From the Executive Directors

By Sarah Vroom, Richard Sykes and April Newlander



Dear readers and friends of the Mattole,

Last year, Mattole River and Range Partnership (MRRP) board and staff gathered at Whitethorn Hardwoods for our annual MRRP Summit. We discussed the results of the survey that was sent out to Mattole residents with the 2022 edition of the Mattole Watershed News. We got very few surveys returned (less than 3% response rate!), with 75% of the respondents being older than 50 years old, and no respondents of anyone under 30 years old. Of those who did respond, the top 5 threats facing our watershed included decreasing water supply, threatened salmon populations, climate change, population growth and water consumption, and wildfire threat. While there was mostly general satisfaction with how the three MRRP organizations engage with the community, there was also those who were left "not impressed" or saying, "community engagement feels slim". There was an overall theme for a need to widen our work with the public and increase citizen-based science.

What came of the 2022 annual gathering was a genuine interest to really engage with our community, stay relevant, be inclusive, and address the most pressing community needs. Youth engagement is a top priority as our organizations evolves with the changing times (and digital communication platforms). Expect to see more visibility and outreach on our ever-evolving events, projects, and programs—some of which are described below. And follow us on social media!

Mattole Salmon Group (MSG) was the first group to formalize in 1980 with a mission to restore salmon populations to self-sustaining levels in the Mattole watershed— a mission unchanged to this day. The salmonid monitoring program remains our central activity and the status is described by Emma Held, Assistant Biologist for MSG, in her article on page 4 of this newsletter. In 2023, MSG completed the planning and design for a project to reroute Lower Bear Creek back to its historic channel in the middle slough portion of the Mattole River estuary. This will provide a source of cool fresh water to fish habitat in the estuary. Work is proceeding now on obtaining the funds to implement the project. Over the past year all work and post project monitoring were completed at habitat restoration projects in the Middle Slough, McGinnis Creek, and McKee Creek, and restoration work continues in Lost River. Sanctuary Forest Inc (SFI) and MSG are working on designing habitat projects in several headwaters' creeks, and MSG and Mattole Restoration Council are doing the same on several mid-River creeks located between Petrolia and Thorn Junction. These design efforts will become our near-future restoration projects.

Mattole Restoration Council (MRC) celebrates our 40th anniversary in 2023! We will mark the occasion with a community square dance and dinner on August 26th at the Mattole Grange. This is the same weekend as the Salmonid Restoration Federation's 25th Coho Confab happening at the Mattole Camp and Retreat Center, and we are thrilled at the potential

for "salmon heads" new and old to connect. As part of our 40th anniversary we are mapping all MRRP projects completed over the past 4 decades. We are thoroughly impressed at the number and geographic range of projects over the years. Highlights from 2022 include a growing prescribed fire program, newly awarded Forest Health projects that will treat thousands of acres of forest and grasslands, expanded invasive plant removal work, continued community wildfire preparedness coordination, tens of thousands of locally grown native plants, and a diverse suite of place-based educational and internship opportunities.

Sanctuary Forest has focused primarily in the headwaters of the Mattole, and continues to participate in strategic land conservation opportunities through fee title acquisition or conservation easements with willing landowners. However, conservation extends beyond acquisition, as stewardship in perpetuity is the big picture. SFI is gearing up for another year of pond building, wood loading for instream habitat and streamflow enhancement, and forest health projects. Learning from nature and adapting to the changing conditions of the landscape is a continual process. Come learn more about our restoration journey on Sept. 30 for our stewardship hike "Evolution of Water Work in the Mattole Headwaters."

As we look forward to the next 40 years of restoration and conservation work in the Mattole the MRRP members hold the past closely as we work to understand and learn from the impacts of our work in an effort to continually grow and evolve like the ecosystems we all work so hard to protect and enhance.

Sincerely,

Sarah Vroom, Richard Sykes and April Newlander

Sunlight filters down
 Through green leaves over creek
 Life is beautiful

by John McAbery, June 2015
 (see page 16)

Glimmers of Hope: A reprieve from drought and a closed commercial fishery may remove pressure from struggling salmon populations

By Emma Held, Mattole Salmon Group



Above: Mattole Salmon Group surveyor Ryan Gonzalez holding a spawned out adult Chinook discovered on a canoe survey. Photograph by Nathan Queener

Mattole Watershed Salmon Report

Freshwater summer rearing habitat for salmonids requires sufficient cool water for juvenile fish to survive and grow, and California's recent history of drought has put serious stress on populations across the northwest. Adequate summer baseflow, measured in cubic feet per second, is crucial during the hottest, driest months of the year. Mattole River summer baseflow in the last ten years has hovered between 10-20 cubic feet per second (cfs) at the Petrolia bridge gauge, but in September of 2021 it dipped to a record trickle of 3.5 cfs. It goes without saying that the 2021 water year was devastating for salmonids however, the moist spring and summer of 2022 provided some relief in the Mattole and watersheds across the west. In the spring of 2022, we received nearly 5 inches of rain in April and nearly 3 inches in both June and July. This small push of water was enough to keep flows above 16 cfs at the Petrolia gauge, good news for juvenile salmon that stay in the river throughout the summer. The summer of 2022 was the first year since 2020 that the MSG and the Department of Fish and Wildlife (CDFW) did not have to rescue and relocate juvenile coho salmon from drying tributary streams.

Each summer, the Mattole Salmon Group conducts snorkel surveys focusing on coho salmon rearing habitat. Given the unlikelihood of witnessing an adult coho salmon in the Mattole, these surveys are the best source of population data for coho salmon. In the summer of 2022, divers observed 3,052 coho juveniles. From this information we can estimate the number of successful redds (nests), and therefore spawning pairs of coho salmon. Based on the number of juvenile coho observed, we estimate that up to 25 coho salmon females spawned successfully in the Mattole in the winter of 2021-22, an encouraging change from observations in 2017 and 2019 where it appeared there were only one or two successful coho redds. While coho salmon numbers remain exceptionally low, in the last three summers juvenile numbers have been 2-5 times greater than the previous generation.

The 2022 fall/winter arrived amid sighs of relief from residents across the Pacific Northwest. A welcome bump of rain came in mid-September, priming the river for steady rains that came at the end of October. The Mattole lagoon breached soon after on November 7, 2022, immediately followed by the first flush of salmon and steelhead beginning their journey up into the tributaries to lay their eggs.

In the winter of 2022-23, the Mattole Salmon Group surveyed key spawning areas in the Mattole River and tributaries looking for salmon and steelhead redds. Our staff observed 169 adult Chinook, 20 adult steelhead and 21 unidentified adult salmonids. No coho were observed. The MSG observed 200 redds (Chinook, steelhead and unidentified). Based on the population estimate formula used by CDFW, the 2022-23 return of Chinook

salmon was 932. This will be the fifth consecutive year that the Chinook population estimate was below 1,500 individuals, however it is a slight bump up from the winter of 2021-22 which estimated 416 individuals. To put this in perspective, the National Marine Fisheries Service (NMFS), which published recovery plans for salmon and steelhead, sets the Chinook recovery target for the Mattole River at 4,000 adults.

In comparison, the Eel River Basin has used underwater DIDSON cameras to document Chinook and winter steelhead passage into the mainstem Eel at Fort Seward. Their observations from 2022-23 show a jump in Chinook population estimate after four consecutive years of relatively low numbers (less than 5,000). For perspective, the NMFS recovery target for the Eel River is 10,600 adult fish.

Closed Ocean Salmon Season

On April 6, 2023, the Pacific Fishery Management Council unanimously recommended a full closure of California's commercial and recreational ocean salmon fishery. Closure ultimately was decided based on a low abundance forecast in California for the coming winter, which is extrapolated from detrimental environmental effects on the salmon life cycle. Chinook salmon are born in freshwater, after which they migrate to the ocean to spend several years feeding and growing until they mature. Typically, Chinook are 3 or 4 years old when they return to their natal stream to dig their redds and lay their eggs. Chinook salmon will not return to the ocean after spawning; they will die in freshwater providing valuable nutrients for the river ecosystem. The timing of Chinook lifecycles is why sometimes we can see a lag between the period of adverse environmental conditions and a low adult salmon return (i.e., severe drought and high water temperatures in 2019 may have led to decreased numbers in 2021-22).

Only two previous years – 2008 and 2009 – have seen closed commercial and recreational salmon fisheries that reflect low Chinook returns in the Sacramento River. In 2022, winter-run Chinook salmon numbers in the Sacramento River were the lowest on record, following two consecutive years of poor reproduction due in part to low survival rates of juvenile fish, high water temperatures and drought-stricken river conditions in 2021 and 2020. The Mattole observations seem to be in line with observations around California – the winters of 2018-2023 estimated less than 1,500 Mattole Chinook returning to spawn.

California Department of Fish and Wildlife (CDFW) has documented the rise and fall of Chinook salmon numbers in the San Joaquin and Sacramento basins. They have found that increases in abundance come 3-4 years after particularly wet winters, and on the contrary that low numbers come 3-4 years after extreme drought conditions. Based on the devastating river conditions of the 2019-2020 winter, agencies have made the decision to remove pressure this year on salmon populations from commercial and recreational fishing. On the bright side, this pattern indicates that our robust 2022-23 winter may lead to increased populations in the next few years. We remain vigilant with our dedication to restoring salmonid habitat, and we remain hopeful for healthy and abundant populations in the coming years.



Above: A juvenile coho salmon seen in the middle slough restoration site on April 1, 2022. Photograph by Nathan Queener

Landscape Conservation in the Mattole River Watershed: Protecting and Rehabilitating for a Sustainable Future

By April Newlander, Sanctuary Forest, Inc.

The Mattole River watershed is highly regarded for its watershed and forest conservation values. Early landscape conservation efforts in the watershed were in response to growing concerns over declining salmon populations and the rapid loss of old-growth forests. In the late 1980s and early 1990s, a collaborative initiative among state agencies, private landowners, and conservation organizations emerged to safeguard the old-growth redwoods and vital salmon spawning grounds in the Mattole headwaters. This collective endeavor resulted in the establishment of the Upper Mattole River and Forest Cooperative (UMRFC), encompassing approximately 6,000 acres of conserved land acquired through fee title or conservation easement acquisitions, including the ~1,400-acre Mattole River Ecological Reserve. Sanctuary Forest has largely focused its conservation efforts in the headwaters of the Mattole and continues to conserve land through fee title or conservation easement acquisitions in the headwaters and throughout the watershed with willing landowners and partners.

In 2005, the Mattole Watershed Plan (hereafter referred to as the Plan), was completed in partnership with local watershed conservation organizations Sanctuary Forest, Mattole Restoration Council, and Mattole Salmon Group. One chapter in the Plan outlined how landscape conservation can be used to maintain healthy aquatic, terrestrial and social ecosystems in the watershed. The hierarchy of conservation priorities identified in the Plan are as follows: 1) fisheries value, with high-potential refugia and presence of coho the highest-ranking factors and significant contributor of summertime flow and cold water also a high priority; 2) presence of old-growth forests with greatest value placed on larger, concentrated blocks of unconserved old-growth; and 3) connectivity to existing conserved areas. In addition, lands that were threatened with potential subdivision or impacts from industrial forestry were also given high priority. The Plan looked at land ownership (industrial timberland owners, ranches, rural residential, institutional, and conservation) to help determine how each group could be approached most effectively when developing landscape conservation projects. Land ownerships were assessed according to the North Coast Watershed Assessment Program (NCWAP) subbasins—Estuary, Northern, Southern, Western, and Eastern. The southern subbasin, located in the headwaters, was identified as the most threatened due to increasing rural residential development and ongoing industrial logging practices, in a watershed facing severe water shortages. The most significant threat still facing the headwaters is low summertime streamflows. To address this issue, Sanctuary Forest has successfully engaged with the residential community through its Storage and Forbearance Program, a water conservation initiative that has become a model for other regions in the state. Sanctuary Forest's early efforts led to the preservation of all the large blocks of Mattole's old-growth redwood in the southern subbasin. Today, SFI's land conservation endeavors have expanded to the protection of larger blocks of younger forests in need of rehabilitation. For example, working forest conservation easements allow for sustainable logging practices that lead to greater forest health, while contributing to the local economy by creating jobs and providing forest products.

Over the past 20 years, SFI has fostered a close relationship with Lost Coast Forestlands (LCF), a sustainable forestry company committed to responsible land stewardship and local job creation. LCF is locally managed by Tim Metz, a Registered Professional Forester from Restoration Forestry, who has been an invaluable partner in SFI's efforts for over 25 years, providing consultation on forest management projects and contributing to the conservation of extensive tracts of land in the Mattole River and South Fork Eel River watersheds with LCF. Sanctuary Forest acquired additional conservation easements in 2014 and 2021 with LCF, amounting to over 4,000 acres. This included the recent acquisition of the Vanauken Creek Conservation Easement—the future site of a community forest with public access, made possible by the generous donations from the community and supporters who



Location of the Lost Coast Redwoods & Salmon Initiative, Phase 3 Project and the surrounding private and public conserved lands along the North Coast in southern Humboldt and northern Mendocino Counties. Map courtesy of Sanctuary Forest

gave over \$720,000 to conserve the land. These projects offer multiple benefits, permanently protecting the conservation values of the land through the conservation easement, but furthermore encouraging best management and stewardship practices through sustainable forestry projects implemented by LCF and allowing SFI to engage in streamflow enhancement and habitat improvement projects, as well as offer educational hikes and demonstration tours.

Currently, SFI is working with LCF on another working forest conservation easement, the Lost Coast Redwood and Salmon Initiative, Phase 3 project. This project will permanently protect approximately 2,300 acres of land with critical salmonid habitat in the headwaters of three tributary subbasins—Baker Creek in the Mattole, and Sprout and Indian Creeks in the South Fork Eel (see map). This project is a vital connectivity piece with the surrounding ~140,000-acre matrix of conserved lands, both public and private. Currently, SFI is seeking funding from state agencies including CalFire's Forest Legacy Program and the Wildlife Conservation Board to support this project.

Considering all the above accomplishments, SFI has added significantly to the number of acres of conserved lands in the southern subbasin since the 2005 Plan was published, with most of the transition from industrial forestland to conservation. However, it is crucial to emphasize that the focus extends beyond the mere number of conserved acres or acquiring every parcel of land through conservation agreements. It is acknowledged in the Plan that such an approach is not feasible, nor desirable. As the Plan aptly states, "the adoption of good stewardship by private landowners will always be one of the most important ways to conserve the natural and culturally determined conservation values of the watershed." We acknowledge that the work doesn't stop at conserving the land but entails ongoing stewardship and may involve restoring landscapes to healthy conditions. The goal is to build resilient ecosystems that can adapt and thrive in the face of a changing climate. While the exact path forward is constantly being explored, the commitment to safeguarding our home and creating a sustainable future for the Mattole Watershed community remains steadfast.

Mattole Field Institute gets away, brings back river-centric field skills - because exploring other watersheds deepens one's love and understanding for our own

By Flora Brain, Mattole Restoration Council



In June, I got an incredible opportunity: to join 20 river-loving colleagues from around the country for a rafting trip on Utah's San Juan River, and a chance to become reacquainted with the watersheds of the Colorado Plateau: an ancient landscape with beautiful, imperiled rivers and long human histories. The Colorado Plateau is a place where right now, society must actively reconcile our ever-expanding demands with finite reality. Lessons learned from the region's rivers may inform human-place relationships in watersheds across the continent. To explore these places with a cohort of university faculty and students all interested in building river skills and field-based programming was a true gift!

This journey began last fall when I applied to the River Field Studies Network's RIVER Scholars program: a 1-year program focused on empowering a diverse group of university faculty and soon-to-be-faculty to build field-based curricula to be taught on rivers. Auspiciously, I was accepted along with a stellar group of 19 colleagues, and would eventually be paired up with two delightful humans: Christiana Saldana, a geographer who focuses on sense of place through her work at Cal State University L.A., and Nico Zegre, a forest hydrologist at West Virginia University whose work involves unlearning everything he's learned about top-down Science in an effort to better serve the flood-prone Appalachian communities he works in. Our trio was matched up with John McLaughlin, a brilliant ecologist who studies the evolution of the Elwha River throughout the era of its dam removals begun a decade ago, and also studies butterflies and phenology and climate change on Mt. Rainier, and also...well, he does a lot. Incidentally John's a total badass river runner. He showed up in Flagstaff to meet the RIVER group fresh off a 12-day kayak trip that carried him downstream from Marsh Creek to the Middle Fork to the Main Salmon River in Idaho, one of the West's absolute most remote Wilderness rivers, where he was attempting to photograph all its instream wood.

Just one of a whole group of about 30 far-flung individuals united by our passion for rivers, John serves as our trio's senior mentor as we work on collaboratively building two field-based lessons that merge hydrology, geography, and philosophy. Like all lessons developed through the RIVER Scholars program, our lessons will be freely available on the open-source QUBES platform: <https://qubeshub.org>

Over Zoom for the last 8 months, we've been focusing on the various aspects of creating curricula to be taught on rivers. On the San Juan, we focused on building the knowledge and skills to run rivers: navigation, safety, gear management, river kitchens, and the ever-important group camaraderie. During the spaces in between, we discussed our lessons, our most beloved rivers, the challenges



Clockwise from top left: The River Field Studies group prepares to launch on the San Juan. Looking SW from Comb Ridge to where Comb Wash meets the San Juan. Flora Brain and fellow River Scholars prepare to flip an upside-down raft. Christiana Saldana, Flora, and Carolyn Cummins practice one method for swiftwater crossings. Flora and John McLaughlin (center) attempt to convince Nico Zegre (right) that love is a stronger and more durable motivation than hope. All photographs by James Vonesh

and solutions to implementing field courses within universities, and the future of wild rivers. As a nonacademic, this peek into the state of higher education was illuminating, and I came away deeply grateful for the River Field Studies Network that pulled all these brilliant and passionate river advocates together.

One of the most fun aspects of our time on the San Juan was a swiftwater rescue certification course. Over 16 hours on the river, we learned about river hydrology and hazards, risk assessment, whitewater swimming and floating, water crossings, self-rescue, throw bags, ropes skills, and much more. Doing this when the San Juan was flowing high and swift at bankfull stage made all these exercises very real.

After the San Juan River trip, the RIVER Scholars and River Field Studies Network members collaborated with students in Northern Arizona University's Riverine Socio-Ecological Systems class over two days to test our field lessons. At sites on Oak Creek near Sedona and Picture Canyon in Flagstaff, we explored hands-on teaching in the field, and heard valuable feedback from the students and each other.

I am particularly grateful to the River Field Studies Network for recognizing the value of including someone like me, who is neither a PhD student nor a professor, in their Scholars group. Furthermore, their 5-year grant supporting all this work is from the National Science Foundation, and their leadership team generously agreed to let me to bring a philosophical approach to my trio, so we can cross-pollinate questions of science and questions of humanity: how do we perceive watersheds? How is it that rivers inspire in us awe, or dreams, or love? What is the role of the human being in regard to rivers, in regard to this world? And ultimately: how, then, shall we live? 🐟

Fascinated by Bats!

By Flora Brain, Mattole Restoration Council

Consider: What if we referred to all the local wild dogs not as coyotes and foxes, but just as "dogs." Could you imagine lumping mountain lions and bobcats into a group we just commonly called "the cats?" Weird, right? They're distinct species, after all. I recently had an opportunity to reflect on how we do this same strange thing all the time when it comes to a remarkable group of under-appreciated mammals. We simply call them "bats."

Yet, in less than three days, researchers who joined a Mattole Field Institute course in mid-May detected 9 different species of bats, all at just two nearly adjacent sites in the lower Mattole.

Did you know these fascinating facts about bats?

Bats prevent \$1.3 billion in agricultural losses from insect pests in California each year, and reduce wildfire risk as the primary consumer of bark beetles and wood borers.

If you made a list of all the different species of mammals on Earth, one out of every 4 or 5 would be...yep, a bat!

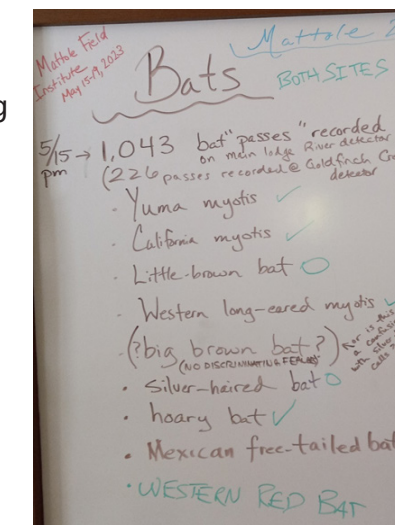
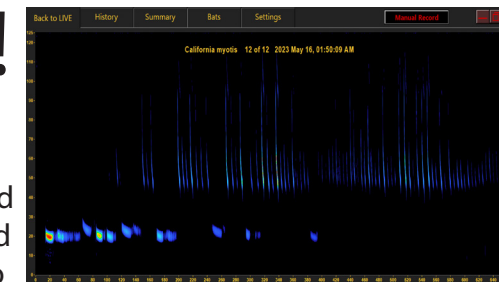
After mating in the fall, female bats of some species will store the male's sperm internally throughout their winter hibernation, only releasing an egg to be internally fertilized after their winter hibernation so they can start their pregnancy right away in the spring.

Some bat mamas give birth to baby bats that weigh a third of her own body weight. Imagine a 100-pound woman giving birth to a 33-pound baby. Yikes.

Despite being mostly too high to register on human ears, bat calls can be detected and translated into visual imagery, the frequencies and patterns of which can be used to identify the species of bat passing by in the night.

Just as in the night when bats occupy the sky above us, we still have bats all around us in the day: roosting in the trees and other secure retreats. Yet try to spot one.

I learned all this due to the generosity and infectious enthusiasm of a team of bat researchers who joined MFI's annual May field course in watershed restoration for a few days. This stellar team included Bronwyn Hogan, the Region 8 White-Nose Syndrome Coordinator for US Fish and Wildlife Service; Ted Weller, Ecologist at the US Forest Service's Pacific Southwest Research Station; Leila Harris, a PhD student at UC Davis; and Joe Szweczek, Professor of Zoology at Cal Poly Humboldt's Department of Biological Sciences. Joe, incidentally, also created the software that translates bat calls from audio into visual imagery, allowing passive



Clockwise from top left: Visual depiction of the simultaneous calls from a hoary bat (lower row of thick dashes) and a California myotis (upper vertical lines) detected on May 16, 2023 above the river near Mattole Camp and Retreat Center; Hoary bat; The bat paparazzi, wearing masks to protect the bats. List of bats detected during Mattole Field Institute's May 2023 field course in watershed restoration.

All photographs by Joe Szweczek except bat species list by Flora Brain

detection and species identification. This team first set up passive audio detectors, and when pleased enough with the evident bat presence, set up 20-foot tall bat nets to capture and record data on some of our resident bats. After collecting data, they released all bats back at their capture site.

So what do bats have to do with watershed restoration, anyway? In continual efforts to better understand and thus appreciate this place, Mattole Field Institute wants to get to know the lesser understood, and possibly vital, wildlife and their myriad ecological relationships in the Mattole. If you're also curious about bats on your property and have access to a riparian corridor, these bat researchers may be interested in exploring whether or not they could set up a monitoring site. Contact Flora@mattole.org for more information.

Very big thanks to Ted, Bronwyn, Joe, Leila, and also to Richard Brown for generously allowing us nighttime access to the creek near his home. 🐟

Marine Mammal Monitoring Program Brings us Together



Above left: Participants in the new collaborative marine mammal stranding monitoring program gather in April for a training. This effort brings together Mattole Valley residents, Bear River Band members and BRB Culture Dept. staff, MRC's Mattole Field Institute, and Cal Poly Humboldt's Biology Department. Dual goals are increased local monitoring efforts and understanding of marine mammals, and increased sharing of items found on beaches for cultural use in Tribal regalia and ceremony. Thanks to Mattole Triple Junction High School for sharing their space. We hope to increase local student and teacher participation in this program. Sincere thanks to North Coast medicine people Ruth, Barry, and Amos for bringing their perspectives. Our engaged community members and volunteers are the heart of this organization.

Above right: A beautiful day at the Punta Gorda Lighthouse and elephant seal colony, May 7, 2023. Pictured L to R are: Flora Brain, Mattole Restoration Council; Dawn Goley, Cal Poly Humboldt Biology Dept.; Sharyl Kinnear-Ferris, BLM Archaeologist; Justin Crellin, Friends of the Lost Coast; Mishka Hamor, BLM King Range Backcountry Ranger (holding baby Harbor, the next generation of Lost Coast stewards); Ryan McAbery, daughter of longtime local steward John McAbery; and Ashley Jacob, Cal Poly Humboldt Biology graduate student. Both photographs by Flora Brain

A Brief History of The Mattole Salmon Group's Restoration Actions in the Mattole River Estuary

By Michael Evenson, Mattole Salmon Group

Over four decades of cooperative restoration actions have taken place in the Mattole River estuary, originally aimed at enhancing our native runs of salmon. My perch above the estuary has afforded me a box seat view of our efforts and the river's response. The changes are encouraging.

Humboldt State University's Cooperative Fisheries Research Unit studied the estuary in 1986 and 1987 (Natural Resources of the Mattole River Estuary, California, Busby et al., 1988 – https://www.krisweb.com/biblio/mattole_blm_busbyetal_1988_estinv.pdf). One of their findings that's interesting to reflect on today is that the maximum surface area of the summertime lagoon in 1986 and 1987 was found by Busby et al. to be a mere 3 hectares. For most of the summer and early fall months in 1986 and 1987, the surface area of the lagoon was less than 2 hectares.



1991: Revetment structures placed along south bank. All photographs courtesy of Michael Evenson unless noted.

My personal observations showed an estuary/lagoon that was extremely shallow in depth - much of it merely ankle deep and warm. Considering the work of Reimers [1978] - which found that juvenile Chinook that over-summered in an Oregon estuary were far more likely to return as spawning adults - in combination with our observations, it seemed that the Mattole estuary was inhospitable for Chinook and a serious bottleneck to recovering the population. So began our restoration efforts.

The Mattole Salmon Group (MSG), working with the US Bureau of Land Management (BLM) and later the Mattole Restoration Council (MRC), implemented a two-pronged approach to mitigate for the lack of suitable habitat for the over-summering fish: 1) place massive rock/wood structures to increase scour and depth throughout the lower mile of the river, and 2) address the loss of slough habitat which had become filled with sediment and became perched above the mainstem channel following the April 1992 earthquake's localized 1-meter uplift.



Volunteers from Bear River Tribe and Mattole residents from Whitethorn to Petrolia gather in 2021 to build floating shade willow mats in the estuary.



"Woodzilla" as built, 2002

In 1989, MSG pioneered the creation of floating shade and cover structures which the juvenile fish flocked to immediately upon placement. These temporary wood and willow structures provided both shade and shelter for juvenile salmonids. These structures continue to be built as popular volunteer activities in summer.

In 1990, MSG built two log revetment structures on the south bank of the estuary and, in 1991, another six along the north bank. These structures provided scour and habitat complexity in the aquatic environment. The South bank structures were still in place as late as 2010 and most of the North bank structures are in place today. Along with structure installation, MSG conducted riparian plantings from 1986 through 1994.

During the early 1990's, MSG convened a meeting with the California Department of Fish and Game, Coastal Conservancy and the USDA Redwood Sciences Laboratory to propose studying the Mattole estuary and developing a plan to restore aquatic function to remedy the hostile conditions for Chinook and coho salmon. Funding was provided to the Mattole Restoration Council to complete the study titled, Dynamics of Recovery: https://www.krisweb.com/biblio/mattole_mrc_xxxx_1985_dynamicsrecov.pdf

This study recommended placing more large log and rock anchored structures in the estuary in proximity to the high-energy flows so that they would scour deeper and provide better habitat.

The first massive structure was a wood and rock assemblage called "Woodzilla" at the mouth of Collins Creek - a source of cold water. When the river channel migrated away from the structure to the center of the floodplain, this structure functioned in the Collins Gulch area, sometimes in the water, sometimes high and dry.

MSG built another four massive boulder/large wood assemblages in successive years. Each one created scour and, over time, buried themselves, sinking into the deep gravels. They continue to function by creating turbulence and scour, aiding the transport of sediment out of the system into the Pacific Ocean and creating temporary fish habitat between high flows. They have become "permanent" hard points in the lagoon/estuary, the tops of which are visible from time to time.

The Mattole Salmon Group, working with a BLM-chartered Estuary Technical Advisory Committee, pursued the use of a helicopter for wood placement of whole trees in the estuary. With seven large wood structures downstream in the estuary, whole trees might hang up and or create their own jams and island building structures. The idea was to give the river the materials it needs to build structures and let the rivers dynamics do the work.

The first placement of 100 whole trees took place between September and November 2013. A helicopter lowered the trees to conserve as much branch and root wad complexity as possible. All



Gary Flosi (CDFW) on field tour of structure #3, built in 2003.

areas disturbed in the process of tree removal were planted and restored to deep-rooted perennial grasses and clovers.

In order to promote longer term residency, the second heliwood placement was conducted in 2016. This effort incorporated constructing triangles of whole trees which were then pinned with 1" diameter iron rod. Most of the trees were placed along the North bank, and some were used to create the massive "Twin Towers" rock and wood structure placed mid-channel.

The most recent cooperative efforts have focused on the Middle Slough area where over 1200 feet of slough channel has been excavated and restored, with the bulk of the work occurring in 2018 and 2021. These slough restoration projects were conducted jointly between the MRC and MSG. The slough is now generally a hospitable location for juvenile salmonids who rear there. Diver surveys indicate healthy young salmon and steelhead.

Throughout all these decades of restoration work in the estuary/lagoon, Mattole Salmon Group has also undertaken extensive monitoring of fish presence, habitat utilization and water quality. Continuing to monitor where fish are observed, how and when they are using the myriad microhabitats now present in the estuary/lagoon and how those habitats ebb and flow in both time and space will help us continue to understand this dynamically evolving ecosystem.



Above left: First slough excavation in 2014. Above right: roughly the same view in July 2023. MRC Native Plant nursery staff salvaged native plants on site prior to the first excavation, replanting them post excavation. Additional native plants were grown and installed by MRC Native Plant Nursery. 2023 slough photograph by Nathan Queener

Where 40 years ago during summertime there were mainly shallow, warm, ankle deep pools of water in a sea of gravel, the lower mile of the river now contains cool stretches of deep blue and green water with willows overhanging the banks, rapidly expanding growth of river sedges where juvenile Chinook hang out, and a complexity of terrestrial and aquatic habitats.

Recently, MSG staff used Google Earth photos to calculate some September lagoon surface areas. Compared to the 2 or 3-hectare lagoon surface area in 1986-87, in 2006 there were 13 hectares under water. In 2019, the surface area of the lagoon was 23 hectares. What this substantial increase in surface area indicates is that the voluminous sediment that filled the estuary/lagoon in the 1980s - contributing then to a restricted amount of aquatic habitat and lack of complexity in that habitat - has met the fate of excessive sediment in a healthy, functioning river: it has been flushed downstream. In this case, it has moved out into the ocean, leaving an estuary/lagoon that boasts much more watery habitat and is a much more fish friendly place. 🐟



Construction in progress of the 7th LWD structure, August 2011.

Reimers, P. E. 1973. The length of residence of juvenile fall Chinook salmon in Sixes River, Oregon. Research Reports of the Fish Commission of Oregon 4(2):1-42.



Heliwood, 2013.



Keeping it Underground in Lost River

By Ash Brookens, Sanctuary Forest



Above: South Fork Lost River groundwater and flow enhancement implementation team (SFI, MSG, and Stillwater Sciences) lead state and federal permitting agency personnel on a tour of the proposed project site in November, 2022. The meadow pictured is where the off-channel terrace pond will be constructed. Photograph by Janna Pingle

The Mattole River watershed, a geologically dynamic, un-dammed river system which lies along the eastern side of the King Range in Northern California, is a historically critical sanctuary for coho and Chinook salmon and steelhead. Coho, in particular, have been struggling to remain in the watershed for decades, yet persist despite habitat loss and reduced streamflows. One headwaters tributary to the Mattole, known as Lost River, has been identified as a priority stream for coho salmon recovery due to its potential for habitat restoration and presence of the species in recent years.

However, several factors limit the ability of coho salmon to thrive in Lost River, which are common to many North Coast tributaries impacted by unsustainable anthropogenic practices and extraction-based economies: channel entrenchment, loss of floodplain connectivity, low summer flows, absence of large wood in the stream and riparian corridors, and lack of sufficient rearing habitat. In drought years, these limitations become exaggerated, and summer streamflows are often insufficient to support the survival of juvenile salmonids. Juvenile fish have been rescued and relocated from Lost River in 2015, 2018, and 2020 due to extensive dry reaches and lethal shrinking of disconnected pools.

To address these issues, Sanctuary Forest, along with our partners, have designed and implemented several projects in the Lost River watershed to improve habitat conditions and enhance late-season flows. The Lost River watershed is entirely under conservation and there are no human water diversions, so our approach is focused on remediation of historical land use impacts and on retaining and slowly releasing rainfall. Through observation of how our previous projects in Lost River and Baker Creek are performing, and of the influence of climate change on recovering forests, we're continually and conscientiously adjusting our approach.

This year (2023), we're making an innovative adaptation to the 'slow it, spread it' groundwater recharge strategy we've employed in prior projects. In addition to traditional storage and recharge ponds, we're creating 'wetland' terraces to increase groundwater storage and decrease hydraulic connectivity (the ease with which water flows through the ground), thereby enhancing and prolonging associated summer flows from the 'wetland' to the stream in South Fork Lost River.

To conceptualize this 'wetland approach,' it can be envisioned as an enhanced vegetated infiltration basin. As water enters the meadow, it fills the ground and is held in the soil, slowed by an underground restrictive clay barrier. It's then gradually released, resulting in sustained seepage of cool groundwater into the stream. Unlike a pond, the 'wetland' meadow area has no excavated bowl and a very low-profile berm (approximately three feet.) The subsurface clay barriers, which

will be installed along the existing terraces, are a key component of the design, as they slow both surface and subsurface flows of water. This will not only provide more water for coho and other stream-dwellers during the early summer, but is intended to improve late-summer flows, contributing to habitat connectivity throughout the dry season. There are other benefits to developing wetland areas beyond streamflow, such as diversification of plant species, nutrient sources and habitat types. Wet meadows also provide an oasis for wildlife during drought and fire.

The project in Lost River has some similar features to other projects that we have implemented in the Mattole headwaters, including our pilot pond project in Baker Creek (the "String of Pearls.") In Baker Creek, however, we found that the water was seeping too quickly through the ground, leaving insufficient outflow from the ponds to the stream by late summer. We have since made improvements to this technique by installing an underground clay barrier to slow the movement of water from the ponds.

However, every project site is different in topography, geology, hydrology, soil composition and access, so there is no standardized formula for transfer across stream systems. What is consistent in the Mattole headwaters is that we have fast-draining ("flashy") alluvium that is rapidly depleted, an issue which has been exacerbated by erosion, climate change and land use impacts. What is also clear, according to Dr. Michael Pollock, Ecosystems Analyst at NOAA Fisheries, is that stream systems with sustained flow tend to have lower hydraulic conductivity.

To restore water, we need to restore the beneficial timing of its allocation within the system. To accomplish this in the South Fork of Lost River, we have refined the design of the underground clay layer that was built at Baker Creek. Trenches will be deeper and wider, ensuring we reach the bottom layer of bedrock or blue clay, reducing the rate of underground flow. A mixture of native soil and bentonite will be used to fill and compact the trench. A French drain will also be installed in consideration of a time when water may need to be released more quickly or abundantly from the 'wetland' meadow to the stream.

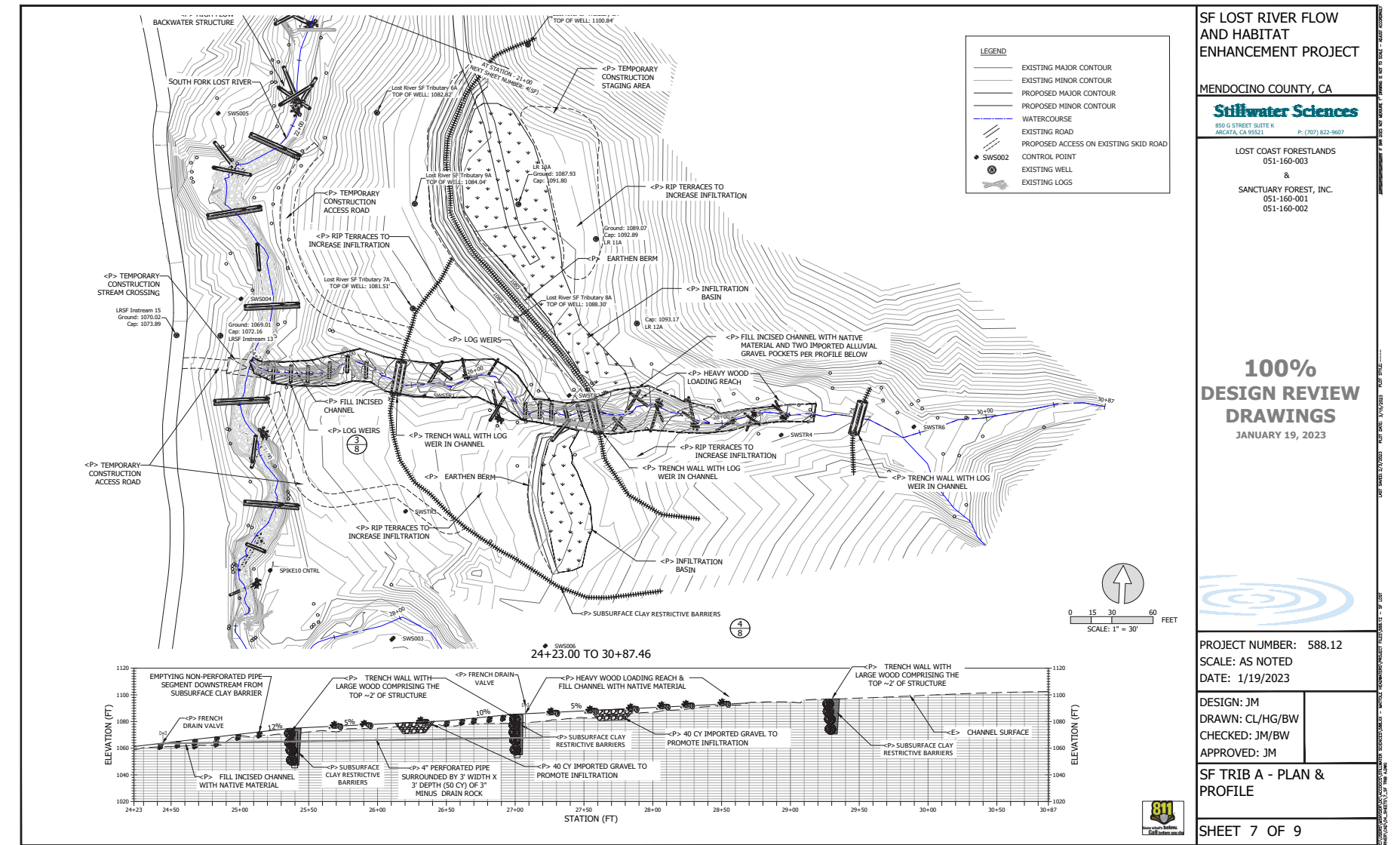
We expect that the flow benefits from increased groundwater storage alone will be variable, mimicking the natural rate of decline. In the absence of rainfall, the Mattole headwaters hydrograph typically drops by about 50 percent every two weeks (based on data from Sanctuary Forest's flow monitoring gauge). So, a more accurate flow benefit prediction for the project was calculated using a hydrograph with a similar declining limb. The table below summarizes the anticipated flow benefits of employing a dual strategy: utilizing passive groundwater projects to significantly increase spring and early summer flows, and direct augmentation in the lowest flow months (Aug 1- Oct 15).

To accomplish this dual strategy, an additional off-stream pond has been designed to store surface water in a neighboring terrace. This pond utilizes pipe-and-valve infrastructure for controlled release, providing a metered flow of water during the months when passive groundwater recharge is not always sufficient to sustain habitable conditions for fish. The combined benefit of these strategies in Lost River are predicted to be as

- continued on next page

Dual Strategy Example: Groundwater Passive Release and Direct Augmentation
South Fork Lost River Tributary in the Mattole Headwaters

	June 15-30	July 1-15	July 16-31	Aug 1-15	Aug 16-31	Sept 1-15	Sept 16-30	Oct 1-15	Total Gallons June 15 - Oct 15
Measured pre-project flows (average gpm)	40	16	6.3	3.8	2.6	0.3	0	0	-1.5 million
Estimated passive release from 'wetland' (average gpm)	27	13	6.5	3.3	1.6	0.8	0.4	0	-1.5 million
Measured flow (gpm) SFR pond	0	0	0	6.8	6.8	6.8	6.8	6.8	-0.75 million
Total passive and metered flow combined	67	29	12.8	13.9	11	7.9	7.2	6.8	-3.4 million



Above: Plan showing the subsurface clay barriers designed to hold and slowly release groundwater later into the dry season. See bottom of plan for elevation view and depth of clay barriers. Design plan courtesy of Stillwater Sciences

- continued from previous page

follows: estimated increase of groundwater storage by 1.15 million gallons with an average streamflow benefit of 6.5 gallons per minute over 122 days (June 15 – October 15); 750,000 gallons of pond surface water storage with metered flow of 6.8 gallons per minute from August 1 to October 15.

While these benefits may seem small, they are significant given that downstream flows drop to six gallons per minute by mid-July and cease by mid-September. These project benefits are expected to be sufficient to retain pool connectivity when combined with other projects (completed and in progress) within the Lost River watershed.

Careful assessment of previous project outcomes, thoughtful planning, and strong collaborative relationships all work to ensure the greatest beneficial outcome for our watershed community (human and other-than). Many minds

come together to envision and execute forward-looking stream restoration projects like these in the Mattole headwaters. Many hands and skill-sets are needed, and we're fortunate to do this work in a community of radical thinkers, talented professionals and dedicated community supporters and volunteers. Sanctuary Forest offers our full-hearted thanks to our project partners at the Mattole Salmon Group, Stillwater Sciences, McCullough Construction, and Lost Coast Forestlands, as well as to Dr. Michael Pollock for generously sharing his knowledge and creative insights; and to our passionate volunteers who assist with project monitoring. We're ever-grateful to our generous community donors and project funders, the Wildlife Conservation Board and Department of Water Resources, for their trust and support in doing this work. Together, we're making progress toward rehabilitation of this irreplaceable landscape. 🐟

Mattole Field Institute Keeping Busy

By Flora Brain, Mattole Restoration Council

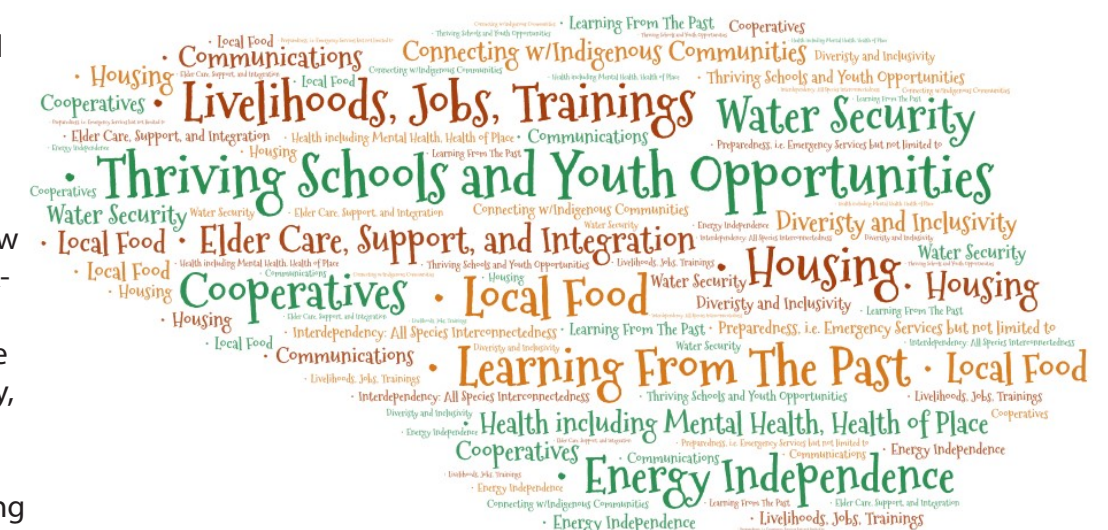
In addition to the being captivated by bats, the River Field Studies Network, and marine mammal monitoring (see pages 6 and 7), the Mattole Field Institute has also been busy with efforts to understand local community resilience needs.

In a focus group held in January and an open public meeting (in person and virtual) in February of 2023, over 60 local residents participated in conceptualizing a list of local community resilience needs (right). Beyond coming up with this list of needs, we also created a "map" of some existing local resources serving those needs, so we understand what we already have.

This process has illuminated our community's uniqueness and the wells of social capital that we have in the Mattole Valley, and is also informing the creation of new programming at the Mattole Field Institute. One new workshop we held in May brought together elders, youth, and those of us in between to explore the cultivation of climate wisdom. With leadership and facilitation from Dr. Sarah Ray, PhD, and Kevin Gallagher, JD, MA, of the nonprofit Emergent Resilience, participants learned how to better equip ourselves with understandings and strategies for addressing the climate crisis.

Participants learned the myriad reasons why being aware of emotions is so necessary: to guard our own wellbeing individually, to mitigate future climate problems by gaining emotional intelligence, to make our movement more efficacious, and to inform the climate movement strategically. Encouraging us to reconsider

See "Mattole Field Institute" -continued on page 13



Free Riders

By Richard Sykes and Nathan Queener, Mattole Salmon Group

The Mattole River can be a pretty crowded place at times. And those times are when the river is clear, the flow is between about 500 and 1000 cubic feet per second at the Petrolia Bridge, and its STEELHEAD SEASON! Here is what the website Bestfishinginamerica.com says regarding Mattole Steelhead: "Some of these ocean-run rainbow trout get pretty big, too. There have been reports of steelhead over 24 pounds, and some avid steelheaders would rank the Mattole only after the Smith River for your odds of catching a 20-plus-pounder." The same website notes improving steelhead fishing year after year in part "due to conservation efforts". The crowds are anglers from near and far that fill the river with drift boats whose numbers appear to be increasing each year. For over 40 years, the primary focus of the Mattole Salmon Group (MSG) has been the support and restoration of the Mattole's two salmon species – Chinook (or king salmon) and coho (or silver salmon). MSG's long-running adult fish monitoring program, all past rearing programs, and most of the restoration projects have aimed to understand and improve recovery potential for Chinook and coho. These programs and projects have indirectly added to our understanding of the steelhead fishery in the Mattole Watershed and since all these fish share the same habitat, projects directed to Chinook and coho have also helped steelhead. Steelhead have been MSG's free riders, befitting from all the habitat restoration work aimed to help salmon. Recently completed work in McGinnis Creek reversed this paradigm – the project mainly focuses on steelhead habitat with potential side benefits for Chinook and coho.

McGinnis Creek is located about two miles upstream from Petrolia. It is one of the few Mattole tributary streams in the lower river with both low-gradient habitat (nearly two miles) and cool summer water temperatures. Dozens of adult steelhead return to the creek each year (40 redds were observed in the spring of 2021) and juveniles can be seen year-round in virtually all the pools in the creek. MSG has observed juvenile steelhead in McGinnis Creek for decades with the occasional sighting of a Chinook salmon and the rare detection of a coho salmon. Its history as a steelhead hotspot is "documented" in Neb Roscoe's book Heydays in Humboldt, More Wild Tales of the Mattole Valley and the Lost Coast of Humboldt County. Roscoe recounts that his two preferred trout

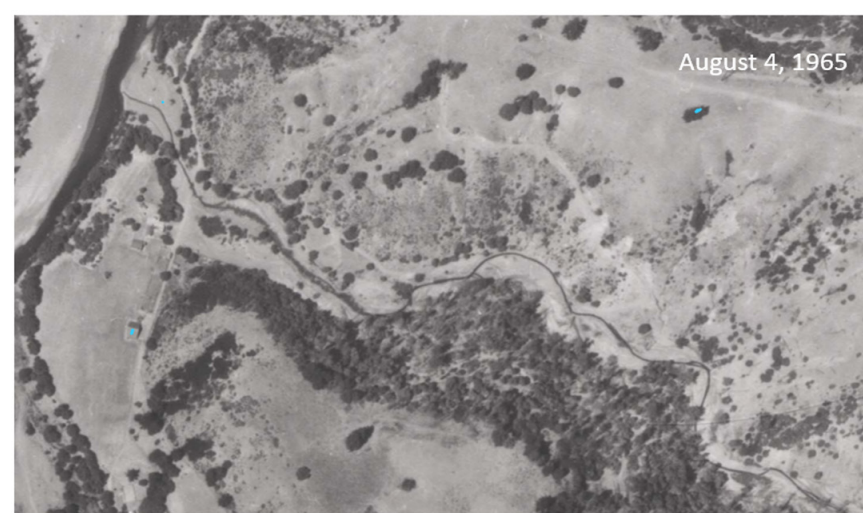
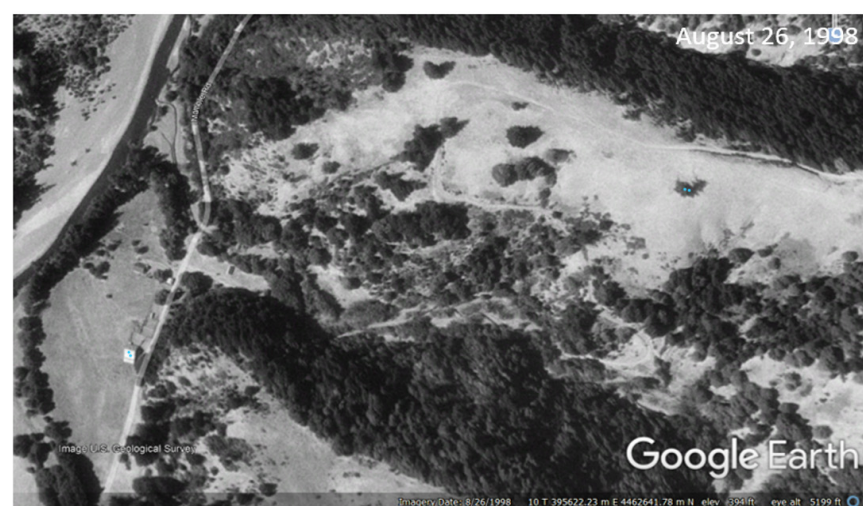


Figure 5. Looking downstream in McGinnis Creek in 2018, before the project. Much of the creek looked similar to this reach, with very shallow featureless runs lacking depth and cover. Photograph courtesy of Mattole Salmon Group

fishing creeks in the Mattole Valley were Pritchett and McGinnis Creeks where he could get a stringer of fish on any visit. In his book Roscoe laments the widespread logging that wiped out the riparian forest and destroyed the river channel in these creeks. The destruction was so complete that he never fished them again following the logging.

MSG's McGinnis Creek Habitat Enhancement Project is a direct response to the historic logging described by Roscoe. A few pictures tell the story. Figure 1 is an aerial photo of the lowest half mile of the creek in October of 1941. The heavily forested areas are the riparian zone, flood plane and immediate upslope areas on either side of the creek. Figure 2 dated August 1965 shows the same view post-logging. The trees are gone. There is no riparian vegetation and the creek and floodplain is entirely exposed to the sun. Fish have no refuge from predators nor high velocity flows, and no shade to keep water temperatures low in summer and early fall. Figure 3 dated August 1998 indicates a recovering riparian area with the beginning of reforestation occurring but still much of the creek is exposed. Figure 4 finally shows a mostly complete canopy along the creek but note these are much smaller trees in that canopy than the canopy that existed in 1941. It is clear that the creek and its surrounding habitat are in recovery, but is also clear that the process is not a fast one.

- continued on top of next page



Clockwise from top left: Aerial photos of lower McGinnis Creek in 1941, 1965, 2019, and 1998. The Mattole River is visible in the top left of each frame. Aerial photos courtesy of Mattole Salmon Group



Figure 6. Same view in 2022. This wood structure has captured spawning-size sediment upstream, caused scour of deeper pools along both banks, and will over time continue to add complexity. Photograph courtesy of Mattole Salmon Group

Free Riders - continued from previous page

Most MSG restoration efforts attempt to assist natural processes and thus speed along actions already occurring. The McGinnis effort was basically the addition of wood (trees/logs) into the lower ¾ mile of the creek which would be occurring naturally if the forest was never removed by logging. Due to the logging disruption, this would not start to occur naturally on the scale needed for another 50 to 100 years! Since the forest is still recovering, very few trees other than windblown alders are now falling into the creek and it will be decades before large fir trees once again "enhance" this habitat by falling into the riparian zone and creating the complexity of habitat that supports a healthy fishery. These trees create pool and riffle habitat, organize sediment and gravels useful for spawning, create shade, and provide areas of refuge for fish who are preyed upon by otters, racoons, birds and other animals.

The pre-project condition was a uniform straight channel

with few shallow pools, little stream complexity and almost no refuge from predators or high flows. The prescription for this condition is to add whole trees and/or logs into the stream channel and floodplain at locations where the water flow will interact with these obstructions over time to create pools, spread out flood waters, retain spawning gravels and create the varied and complex habitat seen in healthy streams.

Figure 5 shows a beautiful creek but poor habitat if you are a steelhead or salmon. Figure 6 shows the same stream reach two years after the project was completed. Note the large wood pieces have created far more complexity including areas with pools and cover that did not previously exist. MSG's monitoring in the three years since the project was completed shows a modest increase in the number of deep pools, significant increase in the cover over these pools, and most importantly about twice the number of juvenile steelhead are now using this habitat.

Projects like McGinnis are not easy to find. Even if a stream has the potential for enhancement, the landowners need to be supportive partners. Much of the McGinnis Creek watershed is owned by Humboldt

Redwoods Company (HRC). HRC forestry manages for long-term timber production and watershed restoration under a state and federally approved multi-species habitat conservation plan, and has been involved in all recent projects on McGinnis Creek. Mike Miles, Director of Forest Operations for HRC, notes that "protection and enhancement of our local fisheries habitat is an important ongoing activity for us across our ownership. We have been participating with the Mattole Salmon Group on monitoring and restoration projects for many years now and plan to continue this partnership into the future."

This project was funded by the California Department of Fish and Wildlife's Fishery Restoration Grant Program with HRC donating most of the trees and logs. MSG, with the support of HRC, is currently working on plans for the addition of wood in the 1.25-mile reach above the recently completed project. Logs generated in an upcoming fuel break project will provide the much-needed wood. These will be placed using a helicopter during summer of 2024 as part of a fuel break project funded by CalFire. 🐟

Mattole Field Institute keeping busy

- continued from page 11

dominant cultural conceptions of time, value, and intelligence was extremely valuable towards the goal of recognizing the blinders that we all wear, but need not. Helping us remove those blinders is both liberating and soothing: there ARE other ways to understand time, value, intelligence, and countless other ideas, and once we recognize those alternative possibilities, taking concrete steps to create the changes we want to see becomes so much easier.

Ours is a community that has a jumpstart on interconnection and social capital, and we also share a deep love for place. Recognizing that one productive strategy entails working to activate

love for place, love for the planet – perhaps in lieu of hope – was deeply beneficial for me, as a participant.

Many thanks to Sarah, Kevin, and Emergent Resilience for generously bringing this opportunity to our community, and to local residents Nancy Calhoun for the initial inspiration, and Tony Anderson for hosting the workshop. Many thanks to The Headwaters Fund and PG&E for supporting our work in understanding local community resilience needs, and to the California Coastal Commission's WHALE TAIL® Grants Program for supporting the Climate Wisdom Workshop. 🐟

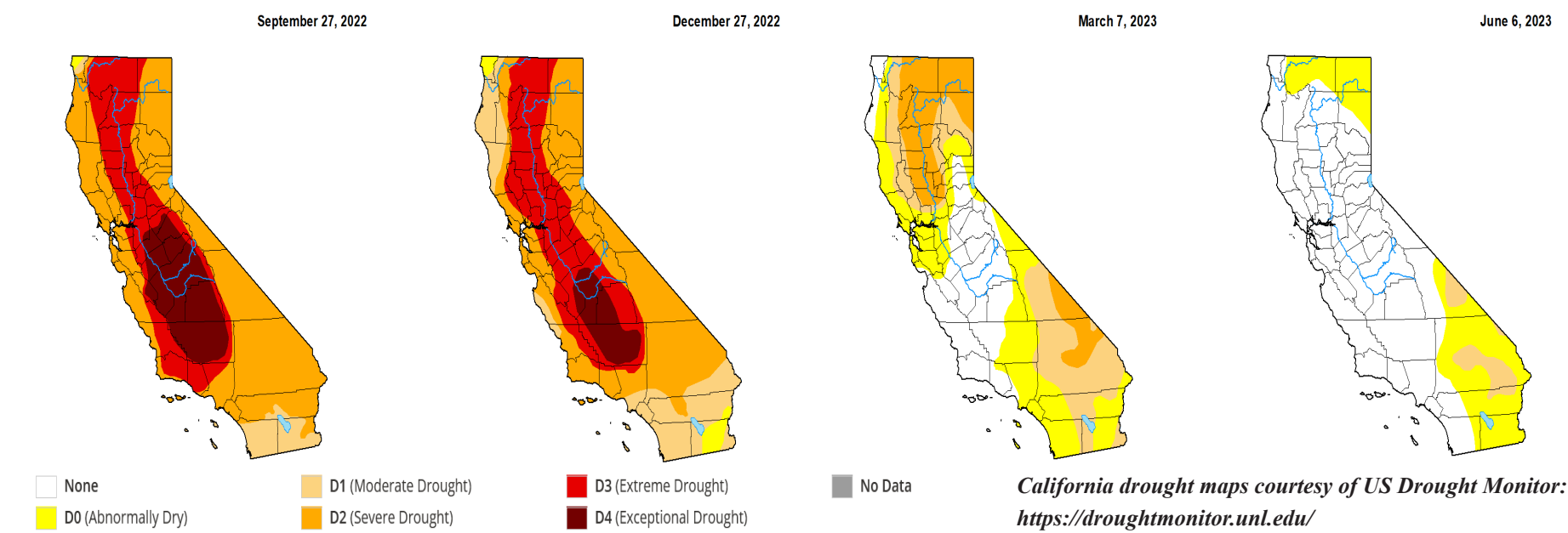
Right: Participants in the climate wisdom workshop. In the words of one participant: "I appreciated the nudges to think outside our "fishbowl" and allow for other kinds of answers - to engage the other intelligences and not look entirely to science and rational thought for solutions... I loved the concept of "hospicing modernity" and feel that too is an important way to reframe this necessary shift... For me, listening to others was so important and helped build the sense of connection."

Photograph by Carol Calhoun



Timing is Everything: Rainfall in the Mattole

By Anna Rogers, Sanctuary Forest



After a winter like that, I bet you didn't expect to read an article about drought, did you? Indeed, as of June 8, most of California has been determined to be free of drought, according to the US Drought Monitor map at <https://droughtmonitor.unl.edu/>. Only seven California counties show varying levels of "D0: Abnormally Dry" and "D1: Moderate Drought." This is a big difference from the start of this calendar year, when nearly the whole state was in Levels D2-D4: Severe to Extreme Drought. At that time, Humboldt County was in D1: Moderate Drought. At the start of the water year, on October 1, Humboldt County was in D2: Severe Drought.

So, from Severe Drought to no drought in just a few months. What happened? You already know – it finally rained! This water year's rainfall came as close to "normal" as we've seen in four years. Here's a recap of the last ten.

Rainfall in Whitethorn (Oct 1-Sep 30 of year listed) - measurements by SFI staff:

- 2023: 92.24" (to date)
- 2022: 68.39"
- 2021: 52.21"
- 2020: 50.4"
- 2019: 106.7
- 2018: 63.96
- 2017: 132.15
- 2016: 90.24
- 2015: 58.46
- 2014: 44.58
- 2013: 124.22

The rain returned, the drought ended—everything we hoped for. All good, right? Well... kind of. In the Upper Mattole River, nonetheless, we have a "low flow problem." This term refers to the fact that in the Mattole River watershed, we don't have water stored in snowpack, so drought is not just related to annual rainfall. Instead, it's also related to the amount of rain we receive in late spring, the length of the dry season, the effectiveness of our groundwater storage, and the geology under the surface.

As a result, it is important not only that we receive a volume of rain that falls within a somewhat normal range, but that we also receive rain late in the spring. In years when we do, we see a measurably shorter forbearance season. "Substantial amounts of late spring rainfall postpone the date at which minimum low flows are attained, potentially shortening the amount of time low flow conditions persist and maintaining year-round flow at some reaches that might otherwise go dry," writes Randy Klein, a hydrologist who conducted a hydrologic assessment of low flows in the Mattole River Basin from 2004-2011.

What is forbearance? To forbear is literally "to do without" and in this case, refers to how SFI is enabling landowners to do without pumping from the river in the dry season, namely by providing water storage tanks, infrastructure, and support. Our Storage and Forbearance program is for landowners in critical reaches of the Mattole River headwaters and tributaries. This innovative, voluntary partnership helps landowners get the water

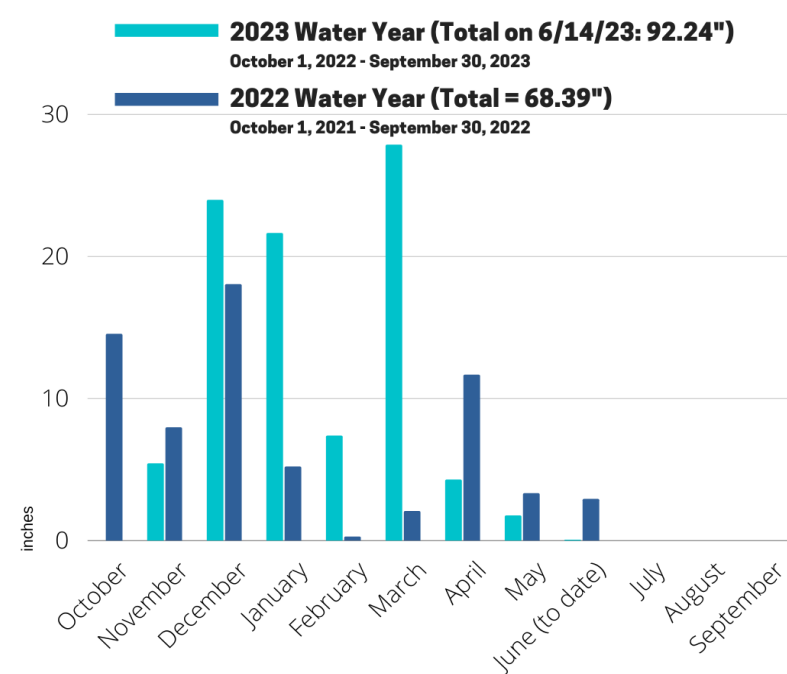
storage capacity they need in order to give up pumping from the river during the critical dry season—and keeps that water flowing when the river needs it most.

For example, last water year (October 1, 2021-September 30, 2022) we received 68.39" of rain. This was a little more than we'd received in the two years of drought before that, but in some ways more severe since we'd already endured two years of drought. However, we received 11.63" in April 2022, 3.3" in May and 2.89" in June. Because of this late spring rain and resulting adequate streamflows, our mainstem Mattole River forbearance participants began forbearance on August 29. Before these late spring rains, 2022 mainstem forbearance was estimated to begin in May. Those late spring rains saved us! Even with typically ample storage, many of our participants may have needed to implement strong water conservation measures. And what about those community members with little to no storage?

This year, we have received over 92 inches of rain—a blessing. But, when we look at when we received the rain, we can see the spring rain timing is not ideal: we received over 27" of rain in March, (wow!) and then just 4" in April and not even 2" in May. With not as much late spring rain to sustain the river, streamflow levels dropped quickly this spring, and continue to decrease as the dry season really sets in. We anticipate mainstem Mattole River forbearance to begin August 5 (subject to change). You will notice this is significantly earlier than last year, even though we received 1/3 more rain this year and the drought was declared over. Conditions are better than during the drought overall, but still not as good as we'd like to see.

The primary takeaways that we can offer here are these: we prefer significant late spring rains in order to sustain streamflows; "normal" may be a thing of the past thanks to climate change; and enhancing your water storage may be advisable in order to provide adequate water for your needs in drought years. 🐟

RAINFALL TOTALS



Blazing Into a New Era of Ecosystem Restoration



Hard working saw crew left to right: Brian Barrick (Salmon Creek), Shira Brown (Briceland), Sam Keener (Honeydew), Michael Martin (Whitethorn), Kahlil Gould-Bayba (Petrolia), Ryan Gonzales (Petrolia), Bill Leach (Salmon Creek), Stephan Beckman (Arcata), Artur Gautier (Honeydew), Wyatt Leach (Salmon Creek). Photograph by MRC saw crew

- continued from page 1

Mattole and Salmon Creek Forest Health and Wildfire Resilience Project

CalFire Forest Health Program funding has created an incredible opportunity for us implement landscape-scale ecosystem restoration projects in the Mattole and Eel River watersheds. This project will address ecological issues across multiple ecosystems while building a local restoration workforce. Treatments will occur on ridge-line forests, grasslands, and oak woodlands all the way down to riparian and instream areas. MRC is partnering with the Humboldt County Resource Conservation District, the Humboldt Redwood Company, the Chapman Ranch, the Valley View Ranch, Cisco Benemann, the 7B Ranch, and the 30/30 Ranch to complete the following restoration projects:

- **Forest Thinning** – MRC crews and contractors will conduct mechanical and manual thinning on over 800 acres of forests to restore late-seral forest conditions and reduce fuel loads. Mechanical treatments will be implemented with masticators and cut-to-length harvesters. Commercial harvest of small diameter Douglas-fir will occur in some areas, with the revenue from log sales going back into the project. These projects will take place on Apple Tree Ridge and adjacent ridgelines in Petrolia, and on the Chapman Ranch in Salmon Creek.
- **Grassland Restoration** – Encroaching Douglas-fir, coyote brush and Scotch broom will be removed from 40 acres of grassland restoration areas on Apple Tree Ridge and Everetts Ridge. All areas will be seeded with native grasses and forbs.
- **Prescribed Fire** – MRC crews, local volunteer fire departments, and other prescribed fire practitioners will conduct over 100 acres of broadcast burns and pile burns in forest thinning treatment areas during several TREX events.
- **Reforestation** – MRC will propagate and plant over 12,000 Douglas-fir seedlings into areas that historically consisted of old growth Douglas-fir forest that are now dominated with dense stands of tanoak due to historic logging and land management. Approximately 18 acres of tanoak stands will be masticated and 2-year old Douglas-fir seedlings will be planted in these areas. Planting will also occur along adjacent riparian areas on the Mattole River and McGinnis Creek.
- **Instream Salmonid Habitat Restoration** – Over 400 trees from grassland restoration areas will be used in salmonid habitat restoration projects in McGinnis Creek. Whole trees will be harvested by local contractors and flown by helicopter to instream restoration areas in McGinnis Creek. Instream wood placement sites are being designed by our longstanding partner, Mattole Salmon Group.

Prosper Ridge Prairie Restoration Project: Phase 9

With funding from the State Coastal Conservancy's Wildfire Resilience Program, MRC, in partnership with BLM and local contractors, will close out a decade of grassland restoration work on Prosper Ridge. The last phase of this project will include 60 acres of grassland restoration including mechanical removal of encroaching Douglas-fir and shrubs from historic prairies and native plant installation, 20 acres of forest thinning, and 100 acres of prescribed fire to maintain previously restored prairies. This project will also continue to build local workforce capacity and build out our prescribed fire training program through hosting a Firefighter Type 1 training and a TREX.

Prosper Ridge Community Wildfire Resilience Project

Creating connectivity to a decade of grassland restoration work on public lands on Prosper Ridge, this project, funded by the USDA Community Wildfire Defense Grant Program, continues similar restoration treatments on adjacent private lands on Prosper Ridge. MRC crews and local contractors will complete over 300 acres of mechanical and manual forest thinning, 50 acres of grassland restoration including mechanical removal of encroaching Douglas-fir from historic prairies and native plant installation, and 80 acres of prescribed fire. In addition to on-the-ground work, this project will also continue to build local workforce capacity and build out our prescribed fire training program through hosting a TREX and other prescribed fire trainings.

Table Bluff Ecological Reserve Coastal Prairie Restoration Project

With recent funding from the Wildlife Conservation Board, MRC will partner with the California Department of Fish and Wildlife (CDFW) and the Wiyot Tribe to implement coastal prairie habitat restoration at the Table Bluff Ecological Reserve. Spearheaded by CDFW Eureka, this project will include collection, propagation and planting of culturally significant native plant species, enhancement of western lily habitat, direct seeding and container planting of native plants on over 90 acres of restoration area, and construction of an interpretive trail.

For more information on these projects, please contact Hugh McGee: hugh@mattole.org 🐟

Farewell John

By many adoring voices from the lower Mattole Valley

Many of us who live near or regularly visit the north end of the Lost Coast came to know John McAbery, the celebrated wood sculptor who lived at the mouth of Four-mile Creek just north of the Punta Gorda lighthouse. For roughly four decades he was a full-time resident actually living on the Lost Coast - and we mean COAST - his home was just feet from the high tide line. John passed away early this year and our community lost a kind-hearted, peaceful beach steward and gifted artist. John raised two children, Ryan and Coulter, who are maintaining his memory and cabins at the beach.

John and his twin brother were born in Oroville, California in 1944. He first visited the Lost Coast in 1963 and returned to live here in 1978. At that time, he bought the 430-acre ranch at Punta Gorda, later selling off 400 acres to the US Bureau of Land Management to become part of the King Range National Conservation Area (KRNCA). John's remaining 30 acres is one of the few remaining private beach in-holdings in the KRNCA. John preceded his nearby neighbors (the elephant seals) by several decades, but like them he visited the Fourmile beach area, found it to his liking and decided to stay.

While John loved the ocean and beach, he also loved deeply the forest and the trees. He could be counted on to support efforts to save what was left of our uncut forests. He honored trees living and he gave them great respect, using them as wood for sculpture or building. John did not waste a thing.

As the steward of Fourmile beach, he cleaned trash and debris from the shoreline upstream and downstream of his house. He asked hikers with dogs to leash them before they arrived at the Punta Gorda lighthouse so that the harbor seals and elephant seals would not be disturbed.

John was known as a creative and talented artist. He preferred naturally fallen California bay laurel as his medium. His sculptures started as seasoned 100-pound blanks, but the finished product would only be a few ounces of wafer-thin wood polished with a combination of beeswax and carnauba. They were always full of grace, as if he caught the magical moment of a ribbon in the wind or a wave-tossed shell. Using only hand tools, he worked for several hours nearly every day of the year to produce about ten pieces a year. His partner, Gretchen Bunker, helped to design many of the pieces and she manages his website and online business. He credited Gretchen for transforming him from a woodcarver to an artist.

Fourmile watershed resident, Bob Anderson says, "He was a guiding light for me in terms of minimalism and self reliance."

Carlos Benemann recalls that when John purchased the Fourmile Creek property in the late 70's, there was just one decrepit little cabin there. That rough cabin was used by Hap Stewart, Walter Beaty and Curly Wright when running sheep on the hillsides above. After John bought all the surrounding acreage he fixed the cabin up to his liking and settled down to be the ascetic

"He was a guiding light for me, in terms of minimalism and self reliance."

in residence on the Lost Coast. Eventually John built two more tiny cabins. (One was occasionally occupied years later by his son, who briefly went to the Petrolia High School at Dick Scheinman's). Small, clean, and beautiful was John's taste in everything. He loved and respected trees and wood and surrounded himself in raw, unpainted wood. Many years later he joined the cabins together with a covered walkway. The Coastal Commission did not object.

In the late 70's the Lost Coast was truly isolated; there were hardly any people wandering through his property back then. But John was always there carving his art pieces sitting on an outside bench or gathering mussels for dinner and fishing off the rocks just steps from his cabin. It seems that mussels were his main diet most of the year.

Carlos notes that "when John first arrived, I happened to ride my horse on the rough trail that goes through his property over the creek all the way to Shelter Cove. The cabin was fenced with well-weathered driftwood, but he walked over as I was stop-



John at his home. Photograph courtesy of Stephen Dishong

ping to admire the scene and lead the horse over the rocky creek. We started a pleasant conversation and I took out a lunch and some beer from my saddlebags to share with him. There was a chess set on his one window sill and of course soon we started a long game on the outside bench on a sunny gorgeous summer day. Turns out he was quite good at it. We kept playing till calling it a draw late that afternoon and I just rode back the few miles to Petrolia. I promised to come back in a week. John asked me to bring some flour and other groceries because he was off the shellfish diet for the warm season. It was the start of many rides (even in windy rainy winters) to play chess and listen to John's stories. Eventually John tired from being a hermit and bought the Hideaway Bar & Restaurant on Conklin Road in Petrolia and a small place to live on nearby Chambers Road."

John ran the Hideaway in a uniquely John way. He hung former Postmaster Jerry Carasco's portraits of locals on the walls. He invited community members in to cook and created a sense of a community gathering place. There was music and food and a fun place for people to come, all presided over by John's energetic direction and hard work. Ellen Taylor remembers cooking a Greek dinner complete with Greek circle dancing to music played by Jenny and Dick. John's creative spirit brought this all to life.

Gordon Hunt recalls a sketchy episode for John during his tenure as owner of the Hideaway. Apparently, his girlfriend at that time was quite a pistol and held him hostage one night after he threatened to exit the relationship. Shots hit the floor but no blood was spilled. Gordon also thinks John would have made a fantastic advertisement for Subaru considering the hard use on his first-generation wagon going up and down the treacherous road from Windy Point to his cabin. Both Carlos and Gordon noted that John's friend and carpenter Jim Swafford of Petrolia made elaborate boxes of various sizes to ship John's art to Santa Fé, New Mexico. These boxes were themselves works of art.

Carlos' son Cisco remembers playing and fishing in Four Mile Creek with John's son Coulter. Like his father, Cisco played chess with John and would talk to him every time he passed the cabin; often the subject was abalone fishing.

While maintaining his "solitary" beach life, John was active in the community. When he sold the upper ranch to the BLM, John bought cattle and went into business with Russell Chambers. The two would spend hours together musing over the state of the world and sharing stories. When Russell died, Michael Evenson took over the arrangement and was cattle partner with John on the Windy Point grazing lease. Michael continued the frequent rides down to the cabin to share coffee and a cheery fire. John was always interested in life outside the beach and they shared their ornery opinions on the state of the world.

John's perspective was strengthened by his sense of security in the place where he lived. He didn't have dogs in every fight, but he sure had opinions about what was right and what was wrong. His love for the Prosper Ridge prairies put him at odds with the MRC, but that didn't stop him from donating a sculpture year after year to their fundraisers.

"John was a beacon of life force that drew you to him. I would always feel crushed with love from his embracing hugs. He lived in a very simple and rustic cabin, preferring the view of the wild over any screen. A pure soul if ever there was one," says Ali Freedlund. 🐟