Summer 2016

the current

abundant wild fish · healthy waters · better California

CALIFORNIA TROUT
FISH · WATER · PEOPLE

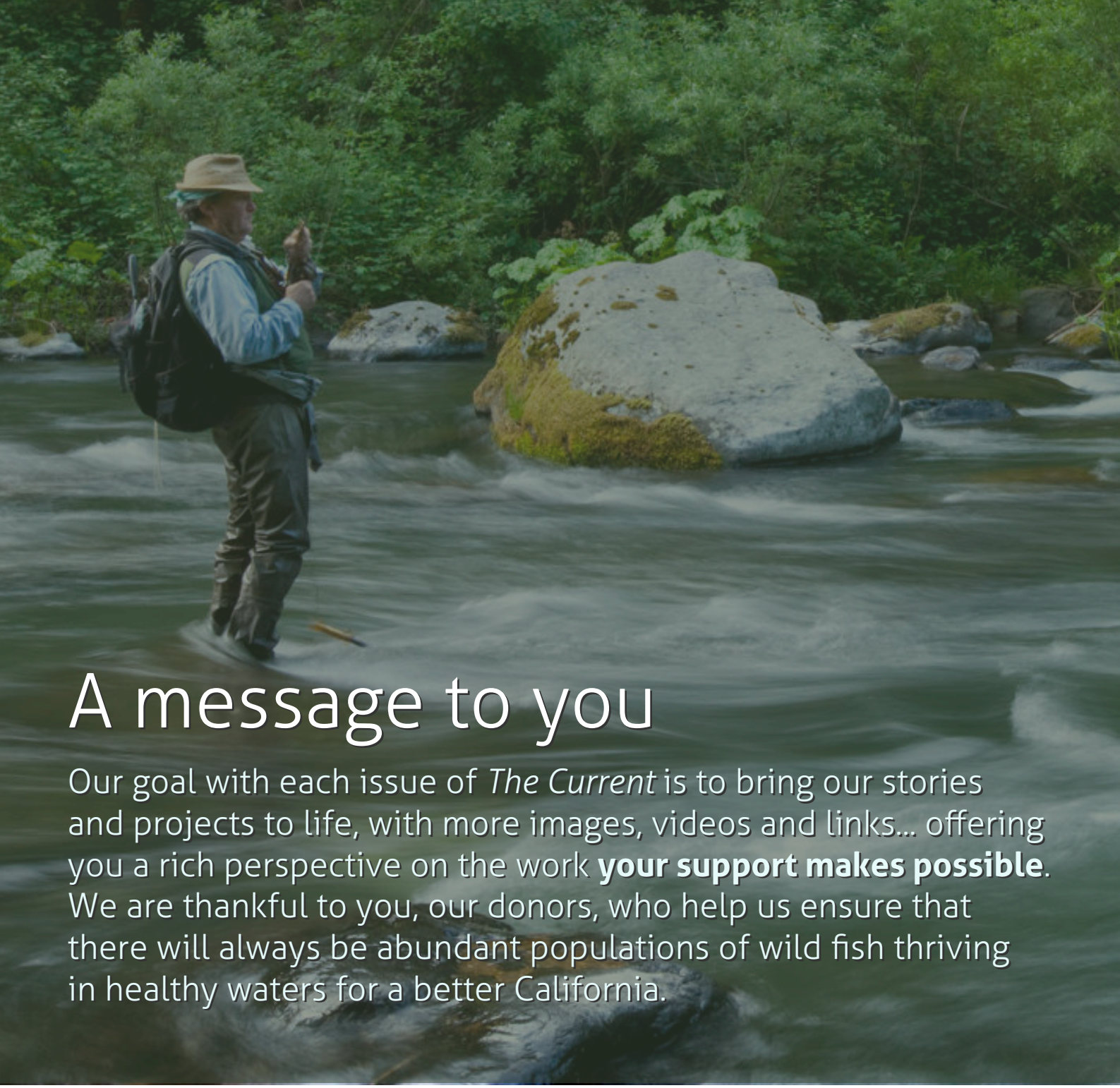
California's Volcanic Aquifers - A Mysterious and Threatened Water Treasure

SCIENCE SIDE

Is bringing back California's salmon a lost cause? We think not.

SALMON

The Central Valley Salmon Partnership aims to reshape CA water management



A message to you

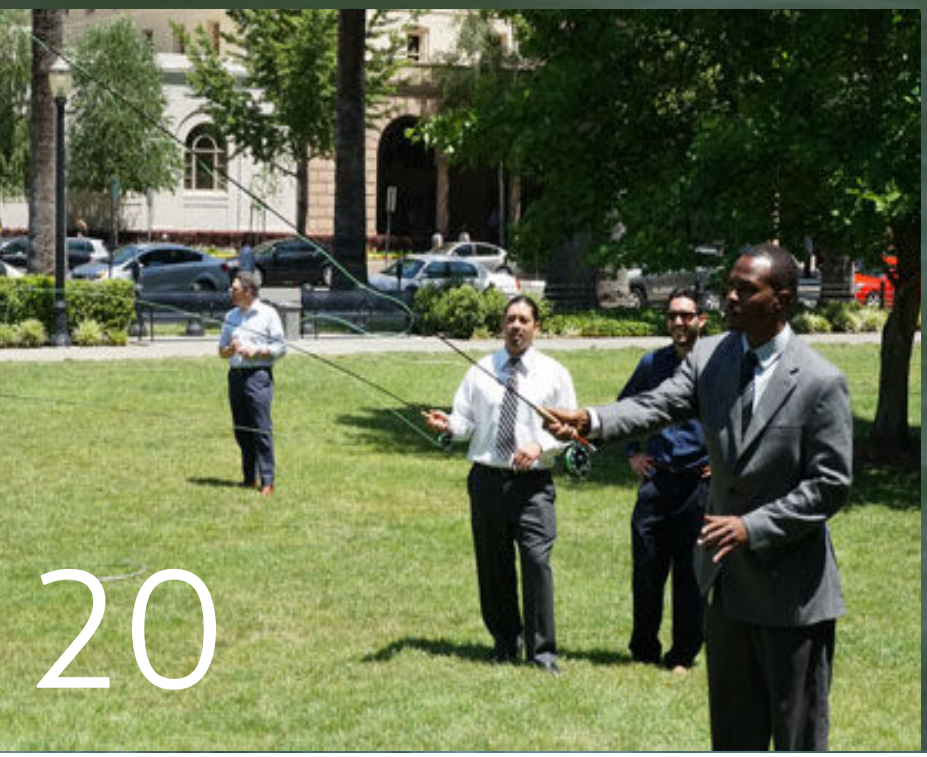
Our goal with each issue of *The Current* is to bring our stories and projects to life, with more images, videos and links... offering you a rich perspective on the work **your support makes possible**. We are thankful to you, our donors, who help us ensure that there will always be abundant populations of wild fish thriving in healthy waters for a better California.

FEATURE

SCIENCE

EVENTS

Cover photo: Keith Brauneis



PROJECTS

REGULARS

REFLECTIONS

California's Volcanic Aquifers

The abundant cold-water springs of the Shasta Region are vital to California's water supply, but they remain poorly understood and unprotected.

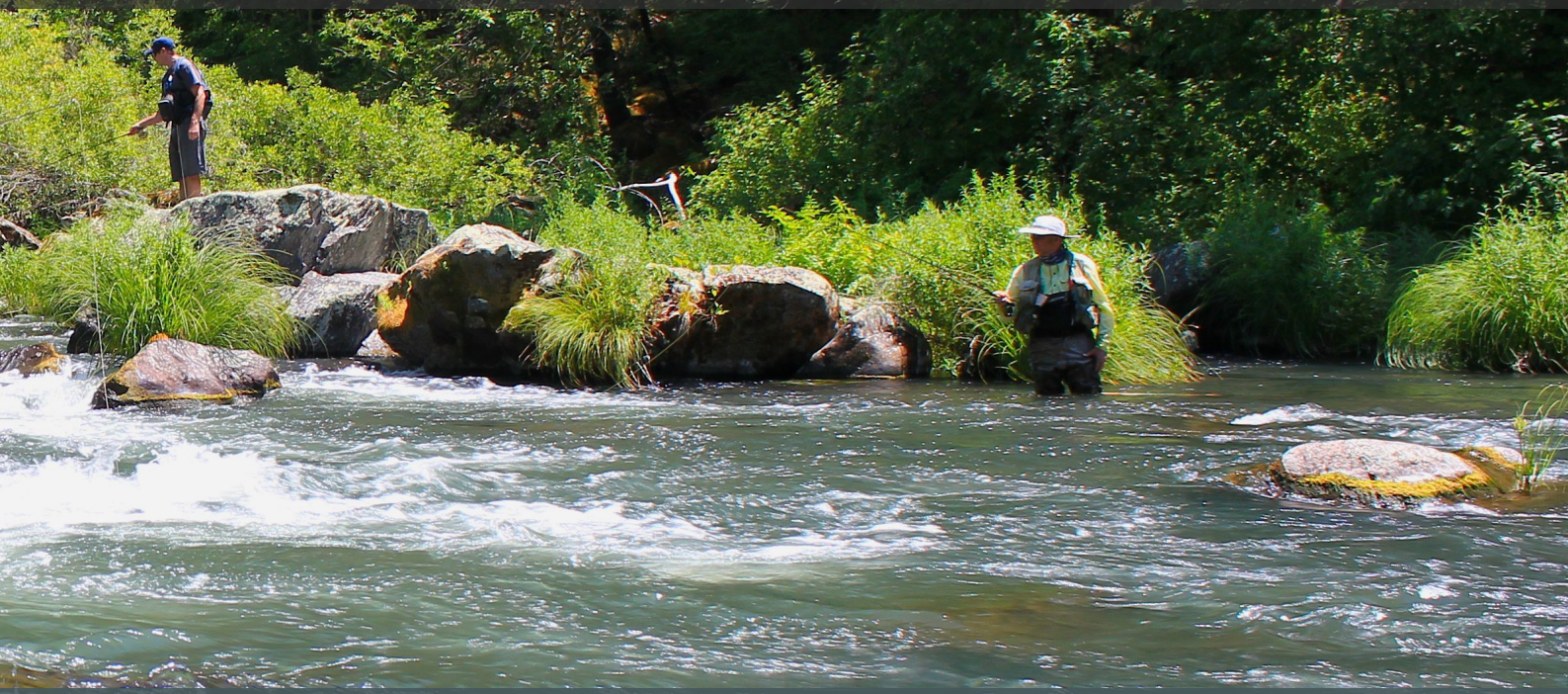
As snow and rain fall on the slopes of Mt. Shasta, Mt. Lassen, and the other peaks of the southern Cascades, this precipitation eventually seeps through the surface and enters a vast network of aquifers that represents one of the most important sources of freshwater in California. This abundant source of cold water rises continuously and insistently to the surface in numerous springs throughout the area, contributing large volumes of water to the rivers that flow into the Shasta and Almanor reservoirs. California's volcanic aquifers provide constant flows of cold water throughout the year. In times of recurring droughts and rising temperatures, these aquifers are becoming even more essential to our state's water future. Unfortunately, scientists know very little about the

FEATURE CONTRIBUTOR

Frank Eldredge

27-year CalTrout Member

Frank joined in 1989 and is a freelance writer covering conservation and fly fishing topics.



region's volcanic aquifers, and there are no comprehensive regulations protecting them from various development threats. The race is on to better understand and sustainably manage one of California's most resilient cold water resources.

The Abundant Aquifers

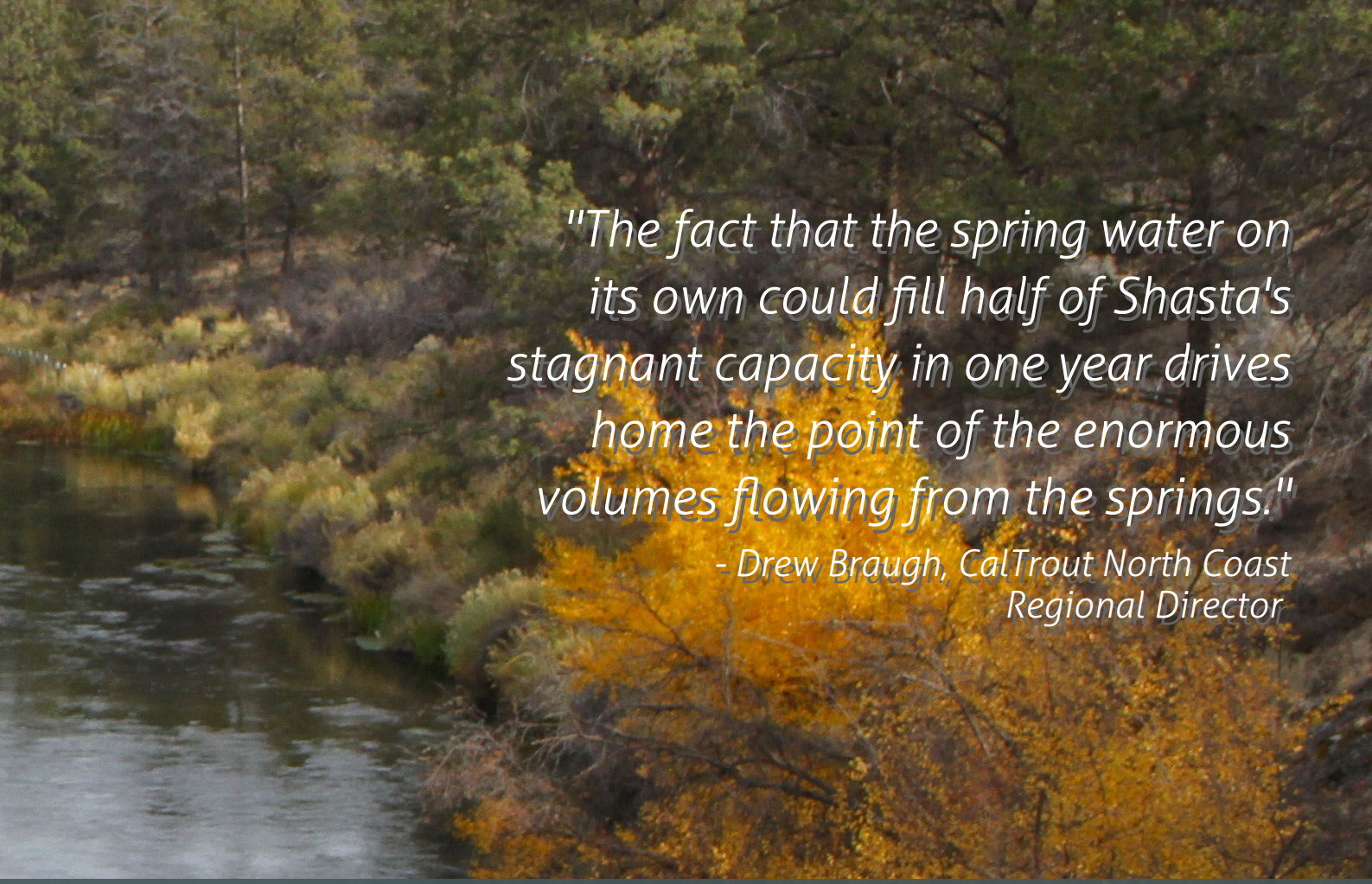
The southern reach of the Cascade Range is located in one of the most remote and sparsely populated areas of northern California, in a region shaped over the last several million years by volcanic eruptions that created a vast layer of permeable volcanic rock. The water stored in the network of aquifers beneath the volcanic rock emerges as springs and feeds the headwaters of the Upper Sacramento, McCloud, Fall, Pit, and Shasta Rivers, providing a significant source of year-round flows of cold water that nurtures aquatic species and fills reservoirs for human uses such as irrigation and hydropower.

Photo by Mike Wier

Enormous Volume Flows from Springs

On average, the total discharge from the area's springs flows at 3000 cubic feet per second and contributes nearly 700 billion gallons annually to Shasta Reservoir. After passing through Shasta and flowing into the Central Valley Project, the water that originates in the volcanic springs accounts for about 20% of the summertime flow in the lower Sacramento River. At a market value of $700 per acre foot, this spring flow represents an annual one billion dollar asset for the state.

Andrew Braugh, the Mt. Shasta/Klamath Program Director for CalTrout, offered another perspective on the contributions of the volcanic springs to our water supply. "Over two million acre-feet per year of spring-sourced water flows from the region's aquifers into Shasta Reservoir, which is equivalent to half of the overall capacity of the reservoir. Although water is constantly flowing through Shasta from both spring and surface runoff sources, and the total volume of water passing through Shasta in a normal or wet year might be in the range of 8 million acre feet, the fact that the spring water on its own could fill half of Shasta's stagnant capacity in one year drives home the point of the enormous volumes flowing from the springs." Scientific studies have shown that spring-fed rivers resist variance in volume and temperature better than watersheds



that rely mostly on surface runoff, such as the rivers flowing west out of the Sierra Nevada. In drought years, the spring-fed rivers of the Shasta region help to offset the deficit caused by decreased snowmelt and account for a higher percentage of the total annual storage of Shasta reservoir (representing between 14 and 30% of the total volume of water passing through Shasta during a drought year).

During our severe drought of the past four years, the cold water provided by springs has helped to stave off potentially disastrous losses of downstream endangered fish, agricultural productivity, and hydropower: in effect, the spring water became our emergency reserve. Climate change is predicted to cause more frequent and intense droughts, shift precipitation to less snow and more rain, and increase temperatures in California. These climate trends make the cold flow from the aquifers even more critical to our water supply and aquatic species resilience. In addition to the large volumes of water, the spring water has a unique chemistry that is ideal for the health of the area's rivers. As rainfall and snowmelt filter through the volcanic rocks, they pass through a layer of sedimentary rock and absorb a unique blend of nutrients composed primarily of nitrogen (N) and phosphorous (P). By the time the water percolates to the surface, it contains an ideal mixture of nutrients that promotes rapid growth of aquatic plants, insects, and fish.

Why Fish Thrive in Spring-Fed Streams

From the perspective of native fish species, the region's aquifers are absolutely essential to their survival. The Fall River Springs, which emerges from groundwater stored beneath Medicine Lake Volcano, is the largest spring system in the western United States. The trout of the Fall River thrive in the cold, nutrient-rich water from these springs, having shown the potential to reach populations of 5,000 fish per mile.

The Shasta River, which is a tributary of the Klamath River that emerges from springs on the northwest flank of Mt. Shasta, is a case study in how cold-water springs enhance salmon populations. The Shasta River is one of the most productive salmon streams in California relative to its water volume. Although in the early 1900s it contributed only 1 percent of the overall Klamath River's outflow, Shasta River accounted at that time for an astounding 50% of the

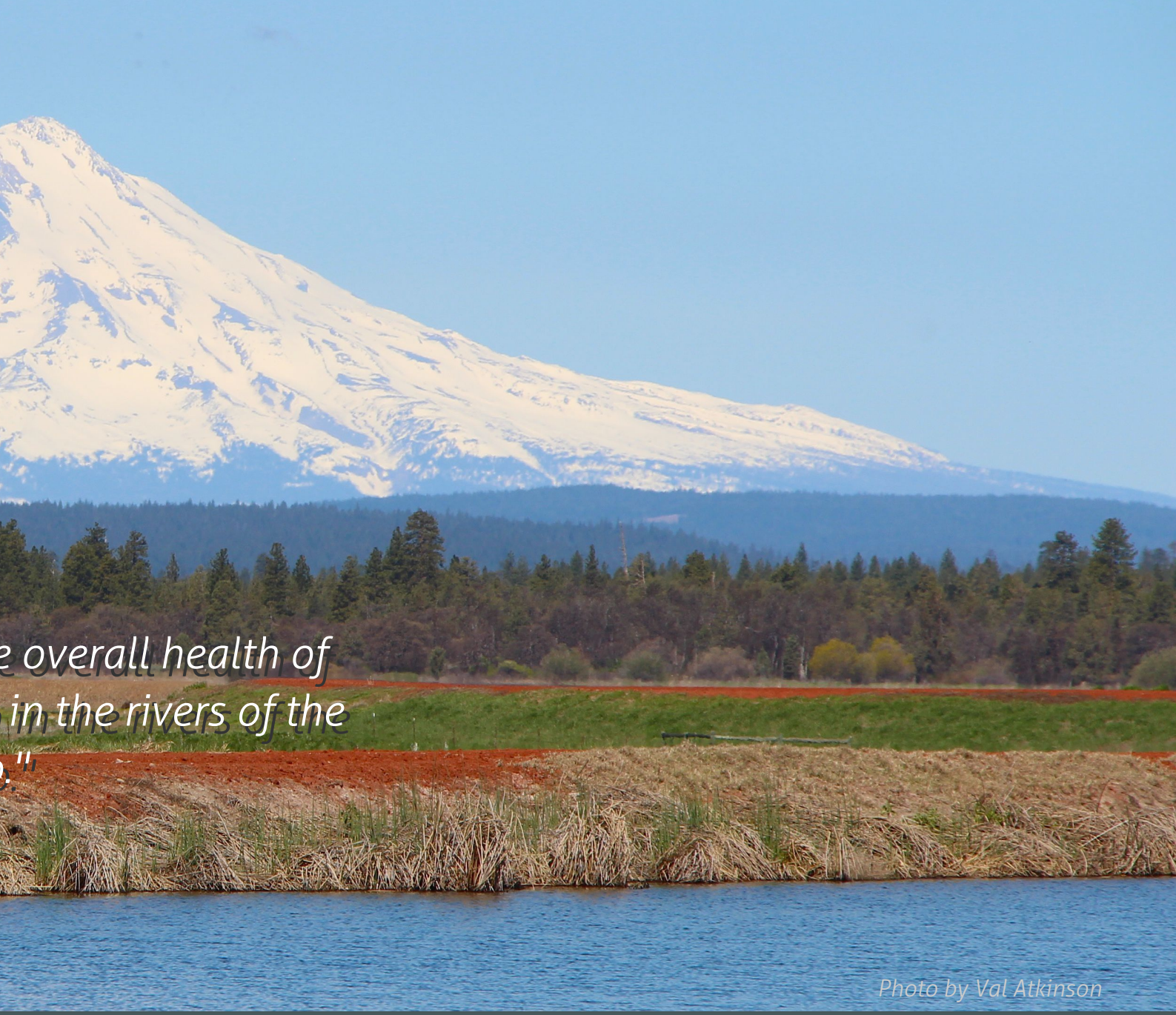


Photo by Val Atkinson

Klamath's Chinook salmon population. The key to this productivity is the constant 55 degree Fahrenheit water temperature, which provides an ideal year-round habitat for trout, steelhead, and salmon. The other factor that benefits the salmon is the rich, geologically derived nutrients in the spring water that allow for abundant and healthy plant life and invertebrates, which in turn provide a plentiful food source for fish. Juvenile salmon grow rapidly in this ideal nursery and gain the size and strength they need to increase their odds of surviving the journey to the ocean.

Curtis Knight, CalTrout Executive Director, shares this perspective: "The springs are not just important to trout, steelhead, and salmon. These systems are telling us something important about the overall health of our watersheds. If there is a healthy wild trout population in the rivers of the Shasta area, we know that our water supply is healthy, too."

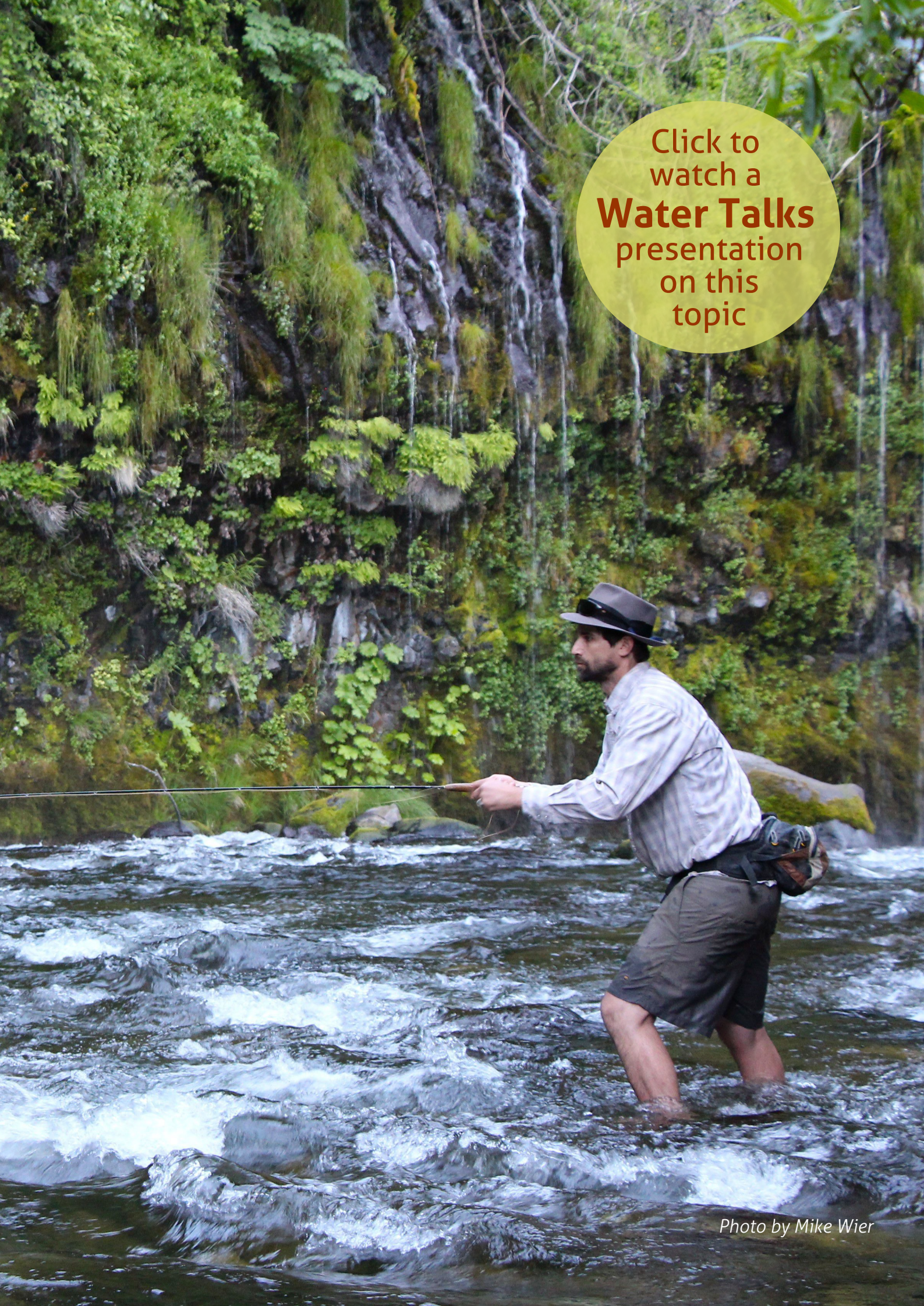
The Challenge of Protecting a Resource that is Poorly Understood

Despite the undeniable importance of this water resource, scientists know surprisingly little about the complex geochemical processes that fuel the volcanic aquifers. These aquifers have never been systematically studied, and thus there are many unanswered questions about how much water they take in and store annually before emerging as springs and rivers. As one example, it was not until 2014 that researchers verified that the source of the Fall River water was the Medicine Lake Volcano aquifer located 30 miles east of Mt. Shasta.

While previous studies suggest volcanic aquifers are resilient to drought and a changing climate, the mechanism of this resilience is not well understood. The first and most pressing need is to conduct studies of the aquifers and springs to establish baseline data and measurements. Long-term monitoring to detect fluctuations compared to the baseline can then be carried out, and this analysis can be used to inform effective policy and to ensure sustainable management of this groundwater.

The Potential Threats to the Unregulated Aquifers

In 2014, the California Legislature finally passed a bill to protect and sustainably manage the state's groundwater: the Sustainable Groundwater Management Act (SGMA). However, this legislation covers only alluvial aquifers, and thus the volcanic aquifers currently receive no protection from this law. It might be possible to add protection for volcanic aquifers to the SGMA in the future, but in the meantime there is a pressing need for local communities, scientists, and organizations to band together to study and manage the area's groundwater on a sustainable basis.


Click to watch a
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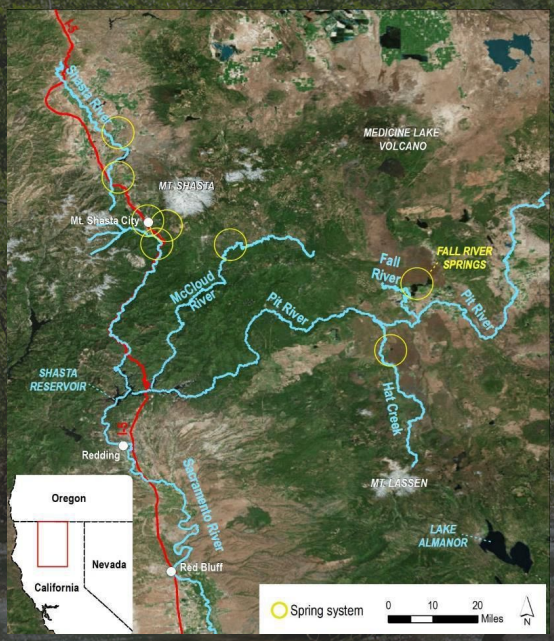
presentation on this topic
Photo by Mike Wier



VOLCANIC AQUIFER FUN FACTS:

Pumps 1.7 billion gallons a day into Shasta Reservoir, or 2 million acre-feet per year

Accounts for 40% of the state's hydropower generation

In the early 1900s, Shasta River accounted for 50% of the Klamath's Chinook salmon population

Crystal Geyser Monitoring

Several potential development threats loom for the unstudied and unprotected aquifers. The bottling industry views the local springs as an ideal source for its operations, not only because of the ample supplies of pristine water but also due to the lack of regulations and oversight. Crystal Geyser's plan to spend $50 million to upgrade and re-open a bottling plant in the town of Mt. Shasta has become a lightening rod of controversy in the community, pitting pro-business advocates who see an opportunity to add much-needed jobs to the region against residents who fear a negative impact on their local wells and water supply. Although Crystal Geyser is confident that their operations won't negatively affect the springs or groundwater, their plans naturally raise questions about the vulnerability of the local aquifer.

The mistrust has been heightened by the fact that there are no federal, state, or county regulations governing the amount of spring water that Crystal Geyser is allowed to take from the aquifer that fuels Big Springs, which in turn is a primary source of water for the Upper Sacramento River.

CalTrout is playing an active role in this conflict by working with Crystal Geyser to implement a regimen of monitoring that will provide reliable data on spring flows. With Crystal Geyser's support, CalTrout has developed a detailed study plan for Big Springs, which includes four new gauging stations and a real-time monitoring system that will measure possible changes in flow and water quality. *(See CalTrout's Action Plan on page 54)*

Photo by Alan Sonneman

In this column we highlight important scientific publications, by CalTrout staff and others, that expand upon our understanding of the management or science regarding trout, steelhead and salmon in California.

By DR. ROB LUSARDI

CalTrout/UC Davis Wild & Coldwater Fish Research Lead with contributions from Dr. Jacob Katz and Dr. Peter Moyle

Inconvenient Realities and

Recently, Robert Lackey of Oregon State University published an article about the collapse of Pacific salmon populations throughout the western United States. Citing recent literature, Dr. Lackey notes that 29% of the approximately 1400 Pacific salmon populations (pre-1800) once abundant in California, Oregon, Washington and Idaho are now extirpated and an additional 28 species of salmon and trout are currently listed under the federal endangered species act. Despite millions of dollars spent annually on programs aimed to recover these emblematic and culturally significant fishes, the current status of Pacific salmon strongly indicates that they are headed for a fate similar to that of Atlantic salmon in Western Europe and the Eastern United States. Dr. Lackey even suggests that the current amount of money spent on wild salmon recovery is "guilt money" or a cost designed to assuage societal guilt associated with

a path to recovery for wild Pacific salmonids

wild Pacific salmon decline. The author argues that recovery is not working and will never be realized unless four "inconvenient realities" are first recognized:

1. Overall, wild salmon abundance, especially south of the Canadian border, is very low and has been so for a long time.
2. We have been well aware for a long time of the causes of the dire state of salmon runs along the west coast of North America
3. Anywhere wild salmon were once plentiful (Europe, Asia Far East, Eastern North America), the decline in their abundance is roughly inversely related to the growth in the human population.
4. It is highly unlikely that most people will accept the substantial life style and economic changes necessary to recover wild salmon runs to

Photo by Carson Jeffres

Glass half full?

Acknowledgement of these "inconvenient realities" represents an important first step in realizing the difficulties associated with species recovery, particularly in California as human population continues to expand and shifts in climate change habitat and species interactions. Certainly, wild Pacific salmonid recovery is an onerous task, especially at the southern extent of the range of many Pacific salmonids, where Katz et al. (2012) recently found that up to 78% of salmonids in California will be extirpated by 2100 if present trends continue. But, it's that last part—*if present trends continue*—that leads us to believe that Lackey is overly pessimistic. Fundamental change in how species, ecosystems, and water are managed is required to reverse the downward trend of wild Pacific salmonids in California. Such change, though difficult, is not impossible.

There is thus a need to abandon the shotgun approach of recovery and narrow the focus and investment dollars on scientifically based approaches. Click through the slides below to see our suggestions that integrate scientific knowledge of natural processes into management of water and fish resources and will improve outcomes for both fish and people.

KEY POINTS

How to Save California's Salmon and Steelhead

1. Rely less on hatchery production of salmonids and minimize interactions between hatchery and wild fish.

2. Improve Pacific salmonid population diversity.

3. Remove dams that are no longer economically viable.

4. Form cooperative programs to create habitat for salmonids. (See CVSP story on page 24.)

5. Restore ecosystems and habitat with a high intrinsic potential to support robust salmon populations.

6. Develop comprehensive recovery strategies that focus on the entire lifecycle of the species.

7. Develop innovative funding and management strategies for salmonid streams.

8. Work with water agencies and the agricultural community to develop strategies to balance water demand and fish-habitat requirements.

Photos by Mike Wier

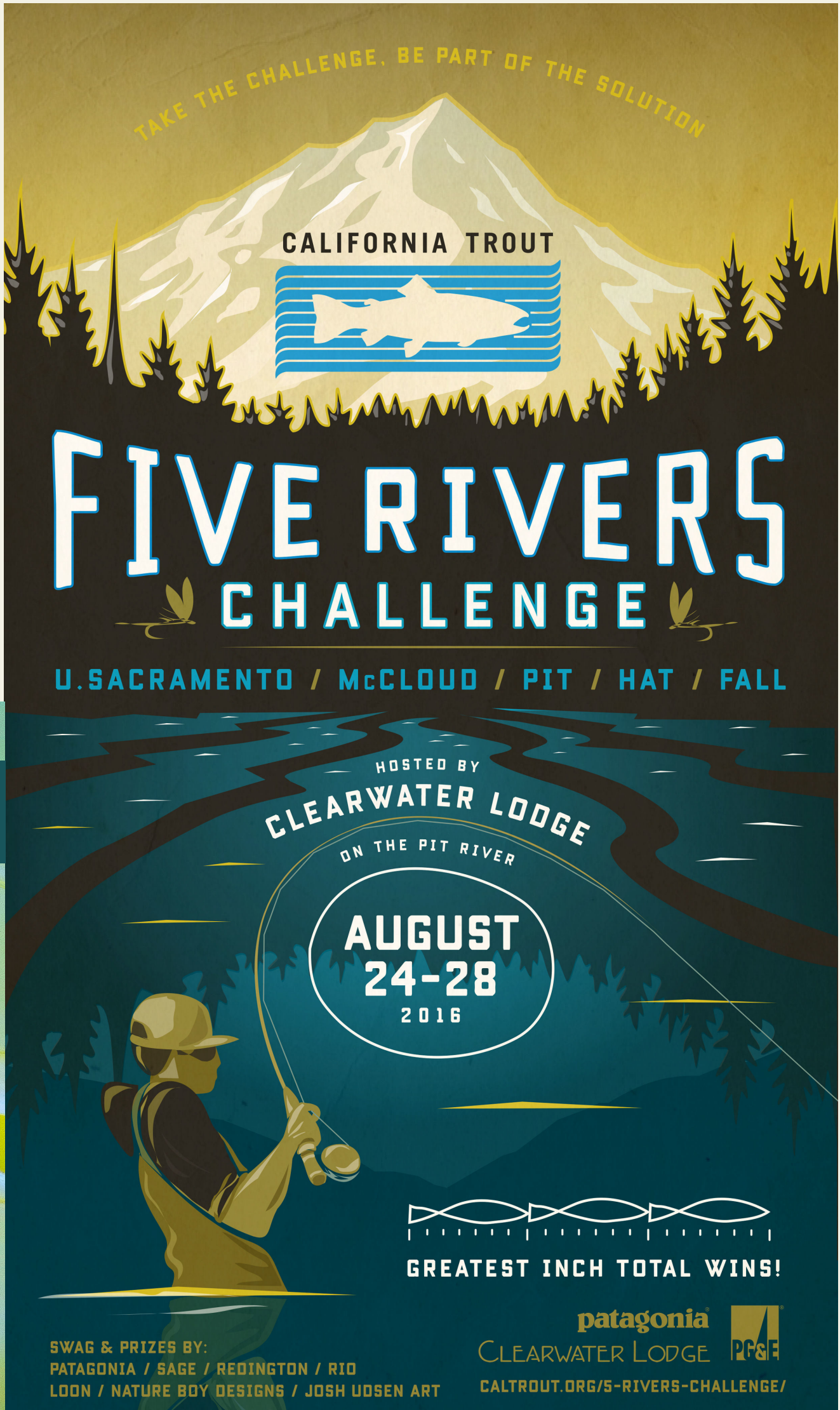
Time is Running Out

These actions are not exhaustive nor will they be easy to implement. Indeed they will take significant time, funding, and further scientific study, as well as major effort to make their accomplishment politically acceptable. As Lackey notes, however, despite millions of dollars spent annually, wild Pacific salmonids continue to decline and time is running out. Changes in how we think about Pacific salmonid recovery and bold actions to restore ecosystem function are needed or we will find ourselves living in a world without salmon.

Robert Lackey's original article, *Wild Salmon Recovery and Inconvenient Reality Along the West Coast of North America: Indulgences Atoning for Guilt?*, first appeared in volume 2, issue 5 of WIREs Water.

Dr. Robert Lusardi is the California Trout-UC Davis Wild and Coldwater Fish Scientist, Dr. Jacob Katz, directs CalTrout's Central California Region, and Dr. Peter Moyle is a distinguished Professor, Emeritus at the University of California, Davis.

Photo by Jeannie Wallen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2016 Casting Call

A day of education, advocacy, and fun

CalTrout and Trout Unlimited hosted the 6th Annual Casting Call on the Sta
The event was an opportunity to to raise awareness for cold water fisheries a
the needs of fish and people in California.

A highlight of the day was the friendly casting competition where teams of
and Staff competed on a course that tested fly casting accuracy and distan
the most points to win and earn bragging rights. CalTrout Executive Director
met with legislators throughout the day on issues the organizations supp
funds from Prop 1 for Klamath Dam Removal, securing funding for wetlan
of AB2087 (Levine) facilitating regional conservation plans, support of AB 22
distributors to fund environmental remediation, and support of SB 1755
accessible water-data platform.

Photos by Mike Wier

te Capitol North Lawn on May 26th.
and advocate for a balance between

Assemblymembers, Administrators,
ce. The Administration team scored
Curtis Knight and TU's Brian Johnson
port such as: allocating appropriate
d and mountain meadows, support
43 (Wood) to levy a tax on marijuana
(Dodd) to establish a new, publicly

California Trout & Trout Unlimited Present
CASTING CALL
A Celebration of California's Unique Trout, Steelhead, and Salmon

Your Support

Being a CalTrout member brings you into a community of Californians who believe that clean, cold water and wild rivers benefit fish *and* people. Our work relies on the support of our members. Please renew your membership in 2016. If you're not yet a member, join today, it's easy!

Your donation makes a difference to fish, wate

Fish are to the ecosystem as canaries are to the coal mine. As such, abunc
mean healthy waters and healthy waters mean a better California. Your do
will help ensure that California will always have abundant populations of
in healthy waters.

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PROJECT UPDATE

By JACOB KATZ PhD
Central California Director

Central Valley Salmon Part

A new model for ag and water management

The 24-hour news cycle famously focuses on bad news. If you pick up a paper, turn on the radio or glance at your news feed there's no shortage of world catastrophe, calamity and tragedy. But when we manage to put down our newspapers, tablets and phones and look at what is actually happening around us, we often get a very different picture. The same applies to California's environmental news stories where the headlines are often filled with drought, climate change, water shortages and impending extinction. But this litany of doom and gloom, while not necessarily untrue, is far from the only story worth telling.

For instance did you know that waterfowl population counts in the Central Valley over the last several years are at all time highs. You read that right, the highest numbers ever recorded for most species! That's a pretty good story worth telling. A big reason for this is the partnership known as the Central

Photo by Jacob Katz

nership

Valley Joint Venture

for waterbirds, one of the great conservation success stories of the last several decades; definitely in California but also nationally. In the late 1970's these same bird populations were at all time lows. But through innovation, collaboration and several decades of hard work government agencies, conservation groups, farmers and water users working together have been able to turn those declines around. Meanwhile fish populations today are at all time lows.

It is high time to replicate the tactics for fish that worked so well for the birds. This seems especially important when literally dozens of other models and efforts to organize fish conservation in the Central Valley and Delta have failed to halt the persistent slide towards extinction of salmon, smelt, sturgeon and other native fish species despite hundreds of millions of dollars in investment.

Photo by Jacob Katz

PROJECT UPDATE

Science-based, multi-stakeholder forum

In response to the need for a cohesive effort to recover Central Valley salmon, CalTrout, in partnership with Trout Unlimited and American Rivers, has convened a science-based, multi-stakeholder fisheries forum modeled directly on the Central Valley Joint Venture. The simple concept is to have a single venue that brings all players around the same table to agree on what makes good salmon habitat and set objectives for the amount of different kinds of habitat needed to recover self-sustaining runs of Central Valley salmon. The Central Valley Salmon Partnership (CVSP) has been endorsed by the Brown administration and has already garnered support at all levels of local, regional, state and federal government. Already nearly 20 resource conservation and fisheries organizations, local, state and federal agencies and private sector partners have joined the CVSP.

Real water solutions for fish and people

The partnership recognizes that Central Valley salmonid recovery is critical for successful and sustainable water management in California. Until these and other native fish species are on a trajectory towards viable, stable and self-sustaining populations, the turmoil over water use, quality and storage, flood management, floodplain land use, and a myriad other matters will continue unabated. Real solutions for Central Valley salmon depend on our ability to collaborate and integrate current science into the way we manage California's water and to work together to build smart, multi-benefit projects that improve river conditions for salmon at every stage of their lifecycle. Only when we have accomplished this will we see real water solutions that support both fish and people. Guided by science, the CVSP will bring water users, farmers, conservations and government agencies together to replicate for fish the conservation success story so dramatically proven for birds.

Watch for us in the news when we gather in Sacramento to sign the CVSP charter and officially launch the partnership in August.

Photo by Jacob Katz

CVSP PARTNERS

National Marine Fisheries Service
- Central Valley Office

National Marine Fisheries Service
- Southwest Fisheries Science Center

U. S. Fish and Wildlife Service

U. S. Bureau of Reclamation

California Delta Conservancy

California Department of Fish and Wildlife California Department of Water Resources

California Resources Agency

California Wildlife Conservation Board

American Rivers

California Sportfishing Protection Alliance

California Trout

Golden Gate Salmon Association

Institute for Fisheries Resources

Pacific Coast Federation of Fishermen's Associations

River Partners

The Bay Institute

The Nature Conservancy

Trout Unlimited

Photo by Jacob Katz


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Beautiful imagery,
45 years of heritage
in 5 minutes!

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CalTrout's history,
packed with photos,
free to download

Photo: Val Atkinson. Hat Creek Restoration with CalTrout's Drew Braugh and T

Ensuring wild fish thriving in

healthy waters... for 45 years.

Legislation and Advocacy

Shaping policy to protect fish and their waters

CalTrout is a known and trusted brand, the go-to organization for issues pertaining to the interplay between fish, water and people. Key public officials solicit the organization's advice and are receptive to its ideas and proposals.

CalTrout works to build and maintain relationships with legislators, along with relevant agencies, on key local, regional, and statewide issues ranging from carbon sequestration policy to funding for floodplain-fish projects. By bringing policy expertise, on the ground experience, community support, science, and advocacy experience to Sacramento, CalTrout advances critical policies, programs, and funding. Using an experienced team of lobbyists and consultants to complement its executive staff, CalTrout develops legislative initiatives, supports or opposes legislation, helps shape the state/federal budget, engages in stakeholder groups, and works directly with key decision makers to craft statewide policy that protects wild fish and the watersheds in which they live. Some of Caltrout's budgeting and legislative efforts this year include:

BUDGETARY PRIORITIES

Klamath Dam Removal ($250M - Prop 1)

Caltrout worked to ensure the state appropriated $250 million in bond funds from Proposition 1 for the removal of Klamath Dam. This will allow the state to capitalize on an historic opportunity for broad environmental and economic recovery in drought-ravaged Klamath Basin and fund essential habitat restoration along streams and creeks on the Klamath River, a key spawning ground for the once-abundant Chinook salmon.

Status: Budget Signed into Law June, 2016

Wetlands and Mountain Meadows funding ($60M - GGRF)

CalTrout is taking its first step into the larger arena of addressing climate change, the most complex ecological problem of our time. The Sierra Meadows Program will work to develop enhanced meadow restoration practices resulting in increases in net carbon within meadows throughout the Sierra Nevada.

Status: Pending Consideration in August, 2016

Iron Gate Dam - one of the four slated for removal in 2020

Restored Sierra meadows are beneficial to native fish and help reduce greenhouse gases

Photos by Mike Wier

LEGISLATIVE PRIORITIES

AB 2087 (Levine) Advance Mitigation

CalTrout is working on legislation that would allow public agencies to adopt regional conservation plans to identify areas for priority investment in habitat and species conservation. This legislation would also allow the Department of Fish and Wildlife to grant advance mitigation credit for early investment in conservation projects or habitat enhancements.

Status: Hearing in Senate Appropriations, August 2016

AB 2480 (Bloom) Source Watershed

This bill ensures that California's source watersheds, which capture snow and rainwater that recharge our state's rivers and streams, can receive financing consideration on the same basis as other water collection and treatment infrastructure. This includes financing for projects like meadow restoration, stream channel restoration, and forest management.

Status: Hearing in Senate Appropriations, August 2016

AB 2243 (Wood) Remediation from Marijuana

CalTrout is supporting a tax on marijuana distributors to fund environmental remediation of damages to streams, rivers, and watersheds of illegal marijuana cultivation.

Status: Hearing in Senate Appropriations, August 2016

AB 1755 (Dodd) Water Data

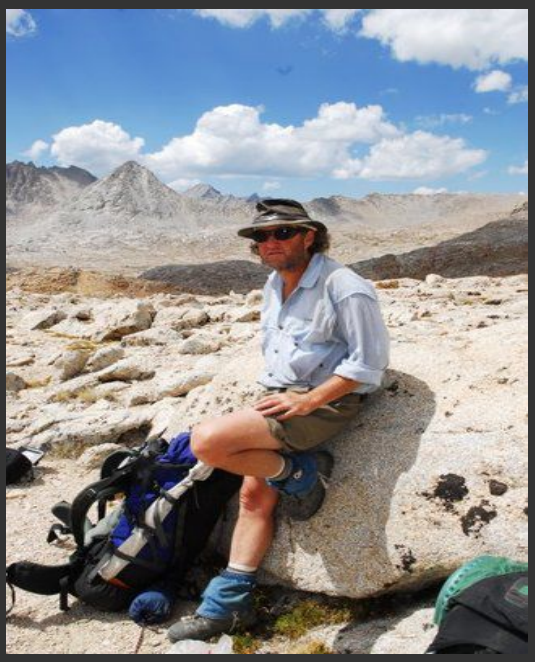
This bill establishes a new publically accessible water-data platform at the Department of Fish and Wildlife for data sharing, water-rights documentation, and water-quality, waterflow, and ecological information. This will help inform better water policy in the state and ensure that our rivers and streams do not run dry.

Status: Hearing in Senate Appropriations, August 2016

Photos: Top - David Snyder, NPS Ranger, Bottom - Mike Wier

Environmental remediation of damages caused by illegal marijuana cultivation would be funded with AB 2243

Protecting source waters and improving water policy are the goals of AB 22480 and AB 1755



Craig's Corner

By CRAIG BALLENGER *CalTrout Ambassador*

Keep 'em Wet!

Among the ideas promulgated by Cal trout Founders, in addition to the 'Wild Trout' component, has been 'Catch and Release' fishing. Driven by changing views regarding conservation of increasingly limited natural resources during the late '60''s, 'Catch and Release' began to take hold on a broader basis.

Since the 1930s, writers like Lee Wulff and Paul Needham, along with Joe Brooks and Rodrick Haig Brown much later on, brought increased attention to these issues.

'Catch and Release' is now embraced even by the Tournament Bass Circuit across America.

The 'Keep 'em Wet' movement follows this thinking and goes a step further. The advent of relatively inexpensive underwater cameras such as the Go Pro Hero, now make possible what was once the rarefied air of those who possessed uber expensive underwater cameras.

Let's see what a little creativity can do for embracing the concept of improving our care for an exciting quarry at the point of capture and release.

I think we will still get the desktop photos our friends and co-workers envy at our office shrines. We can always use some of those great shots in The Current. Send them along to current@caltrout.org!

Spot Check

By MIKEY WIER

The Truckee is Alive!

Like many of the fisheries in the Sierra, the Truckee was hit hard by the four years of drought in California. Unlike some of the other rivers in the area, the Truckee's wild trout fishery has survived due to resilience in the system and dedication by its community of anglers.

Last fall the Truckee was on the brink of total collapse. Tahoe dropped below its natural rim and the Truckee hadn't flowed from its main source in over a year and a half. Even the iconic Fanny Bridge fish had to be captured and relocated into the lake for survival. The few reservoir sources that can feed the river kept it alive, but just barely. Flows were non-existent in the first several miles of the river. Small trickles of water from Donner, Martis, Prosser and Boca and a few boosts from summer thunder storms kept the lower river flowing at around 100 csf down through the canyon throughout the summer and fall. Subsequently,

water temperatures reached the 70's for much of the summer. Much of the prime habitat in the upper reaches of the river had to be abandoned. Luckily, the fish of the Truckee River are used to utilizing the whole system and many of them were able to move down into the deep pools of the canyon where thermal refugia allowed survival.

In this state, the fish are very vulnerable to predation both by humans and other predators such as osprey, eagle, merganser, snakes, otter, raccoon, and mink. Due to these extreme conditions local anglers of the Truckee enacted a voluntary hoot owl closer the past two seasons to help protect the beloved wild trout. Anglers agreed to stop fishing the river when temperatures reached over 70 or flows dropped below 100. Many anglers stopped fishing the river all together. The population of trout took a hit, but unlike many other rivers in the area, the majority of healthy wild fish survived.

Photo: Mike Wier

A good winter season has dropped life saving precipitation in California. Earlier this month Lake Tahoe reached over a foot above its natural rim for the first time in three years. That means the Truckee River is once again spilling from it's main source and flowing strong all the way to Pyramid Lake.

Climate change has equated to warmer winters so much of this year's precipitation fell as rain and warmer temperatures overall kept the snow melting and flows up in the river even through the dead of winter. The fish have now had about seven months of good healthy flows and cold water. We even had a good spring run off and high flows to clean the river up a bit. This has allowed the fish to spread out and start making their way back into the upper stretches of the river and into the normal haunts. Flows have now cleared up and stabilized. The bugs are abundant and the fish have been harvesting them.

If you've been to the Truckee every year and seen the cycles of the river, it feels like visiting an old friend who's been sick and is now healthy again. Water in the Tahoe City reach is more then a welcome sight. Cold clean water trickling in from all sides of the main stem feels like normal times again. The fish are back up into the pockets all the way up to the town of Truckee.

I floated the river for the first time in 3 years last week. It felt great to be gliding along on the cold clear water again and casting line into beautiful riffles and deep pools. Most of the usual bugs were active and we saw caddis, beatis, brown drakes, yellow sallies and even a few golden stones. Fishing remains good from Glenshire Drive all the way down to Stateline.

The Verdi stretch of Nevada also held up pretty well and is fishing good. Below Reno, however, took more of a hit. Temperatures in that reach were just too high and many of those fish had to move up river or perished. It will take a little time for that far east water to rebound.

If you're heading to the Tahoe area, the Truckee is worth a stop. Just remember to tread lightly and be respectful of other angler's space. The River is catch and release with single barbless hooks all the way from Truckee to Stateline. If you see people poaching fish or using bait be sure to politely let them know the regulations or call the local warden at 1(888) 334-CAlTip (2247).

MIKEY WIER, *San Lorenzo steelies*

REFLECTIONS

Photos by CalTrout Members and Followers

MIKE WIER, *Tuolomne River, Yosemite*

REFLECTIONS Photos by CalTrout Members and Followers

MIKE WIER, *Lesli Ajari casting on Hat Creek*

AARON VANSCHYNDEL, *Brown trout on emerald wa*

Send us your pictures to be featured in *The Current*
current@caltrout.org

CALTROUT VIDEO VAULT

PROTECTING STRONGHOLDS

CalTrout is working hard to protect California's last best salmon and steelhead habitats with our North Coast program focusing on strongholds in the Eel, Klamath and Smith Rivers. With your help we can bring back Wild fish abundance in some of California's last wild rivers.

SWING NORTH

CalTrout's 2014 film by Mikey Wier as he and Jason Hartwick hook into the growing population of wild winter run steelhead on the Eel.

SINGLE HANDERS & SKATERS

By Tyler Orton and Curtis Ciszek - Dillon Renton from Renton River Adventures and Sterling Dillingham from River Runner Outfitters Fishing for Steelhead in Oregon with single hand Fly Rods and Dry Flies.

TESTIFY

By Aaron Peterson Photography - Testify is a visual poem adapted from the essay "Testament of a Fisherman" published in 1964 by Michigan author John Voelker.

Who We Are

IN THE SPOTLIGHT

CANDICE MENEGHIN *Conservation Program Manager*

Candice has held diverse natural resource management positions with both public and private agencies before immigrating to the United States in 2011. She was introduced to Southern steelhead in the Santa Monica Mountains, where she now lives with her husband and two dogs. Candice joined CalTrout in 2012 and lives in L. A. with her husband.

Photos: Mike Wier

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Volcanic Aquifers continued from page 13

Geothermal energy development poses another potential threat to the aquifers. Calpine energy is proposing geothermal development in the Medicine Lake Highlands, which will require large-scale water use and potentially polluting methodologies including geothermal fracking and acid leaching. Just as in natural gas extraction, Calpine will need to inject a fluid to induce rock fracturing to release the trapped geothermal energy. This extraction would require a large water source for the fluid injections, and would also present potential risks to water quality from spills in surrounding aquifers from the hydrofluoric acid used to break up the rock. The Fall River Valley does not have a formal groundwater authority that could be used for vetting and gathering input on potential impacts.

Timber production and grazing are two other potential stressors on the watershed. The forests of the area, which boast the most biodiverse conifers in the world and the tallest ponderosa pines found in North America, absorb and slowly release water into the aquifers and watershed when they are operating optimally. Over a century of logging, clearing of land for grazing, and fire suppression have compromised the forest's ability to perform this vital role for the local aquifers. More study is needed to understand the relationship of healthy forests to water storage, which would form the basis for a plan to manage the forests sustainably as part of the area's overall water conservation strategy.

The Strategic Plan for the Aquifers

CalTrout recognizes that there is no time to waste in studying and protecting the irreplaceable and vital source of cold water that these volcanic aquifers represent. The first step i
baseline research, and the
and monitor the effects of
and human uses on the a

The baseline data gather
fundamental questions: H
storage on the accumulati
rainfall? How extensive a
How much water is stored

CalTrout's plan has thre

1. Establishing a scienti
   volume spring systen
2. Identifying important
   potential stressors
3. Informing decision-m
   threats to this resour
   development, ground
   additional surface st
   agriculture and grazi

The baseline studies will
Creek, Shasta River, the
Springs.

In the context of our rec
climate, and increasing w
to improve the scientific
systems because spring
important than ever. CalTr
scientific data about the v
policy and regulations in
needs of fish, water, and

For more on CalTrout's work
our Northern California
Headwaters Keystone Initat

n the process is to do the
n use this data to measure
droughts, climate change,
quifers over time.

ring would address some
How dependent is aquifer
on of melting snow versus
re the volcanic aquifers?
d in them?

ee primary goals:

fic baseline for all large
ns throughout the region
t recharge areas and

nakers about potential
rce, including geothermal
dwater pumping,
orage, and water use for
ng.

encompass Fall River, Hat
McCloud River, and Big

cent drought, a changing
vater demand, it is critical
understanding of these
-sourced water is more
rout is committed to using
olcanic aquifers to inform
a way that balances the
people.

x on Volcanic Aquifers, visit
Volcanic Aquifers and
ive page on our website.

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Thanks for spending time with

The Current

Please send us your emails, photos
and comments to current@caltrout.org
We want to hear from you!

Photo: Art Hau