

Annual Donor Update

WINTER 2023



SARAH CLOUD
EXECUTIVE DIRECTOR

A Common Sense Solution

Conservation battles tend to be long. Among the hazards of fighting the good fight is the tendency at times for patience and persistence to wear thin. The collective memory of good alternatives can sometimes feel like it's grown dim.

To fight this kind of campaign fatigue, good allies are a necessity. And so is good information. Currently the DRA seems to be going one for two on acquiring these two vital assets.

We have plenty of good information. We know there's a common sense solution to the issues facing the lower Deschutes River that PGE and stakeholders are choosing to ignore. This solution can be found in PGE's own water quality report from 2019: the Night Blend Scenario.

As a science-based advocacy organization, the DRA submits records requests to DEQ to receive the blends used in operation of the Selective Water Withdrawal Tower. These records have shown that PGE releases 100% surface water for nearly eight months out of the year. For a short time during the summer, usually beginning in July, blends based on a flawed temperature model (which uses maximum daily river temperatures rather than average or minimum) keep the river dangerously warm. And just as importantly, pH levels are so high, they violate state law nearly every day from April through October (107 out of 108 days at our Maupin monitoring station this past season, 132 out of 157 at our Warm Springs station.)

The Night Blend scenario would be the quickest, easiest way to address these vexing water quality troubles. Night Blend, we can all

A Common Sense Solution is continued on page 5

2023 ACTIVITY REPORT

Read our advocacy, science, and community highlights for 2023. We are building a strong reputation for science-based, data-driven advocacy.

Page 6

MACROINVERTEBRATE STUDIES UPDATE

Rick Hafele reports on this longitudinal study with new data collected in the lower Deschutes in October 2023.

Page 8

THE STATE OF THE RIVER

Steve Hawley synthesizes our most recent studies to explain our priorities and advocacy approach as we head into 2024.

Page 10

Science-based, data-driven

The Deschutes River Alliance is a science-based conservation group focused on researching the Deschutes River Basin and restoring vital habitat in the lower Deschutes River. Led by a team of experienced scientists, water quality experts, local river guides, business owners, and passionate members of the public, we are dedicated to ensuring the health and well-being of the Deschutes River.

Prioritizing Water Quality for a Sustainable Future

The DRA is committed to restoring colder, cleaner water in the lower Deschutes River, and reversing declines in Redband Trout, salmon, and steelhead. Our scientists monitor key factors impacting the river's health, prioritizing water quality assessments in Warm Springs and Maupin, Oregon. Rigorous analysis of nutrients, algae, and aquatic insects are our top priorities.

A River For All

The lower Deschutes River is a national treasure that should be both enjoyed and protected by everyone. The Deschutes River Alliance welcomes all that value the river and want to see it thrive. Join us as we strive for a river that is the confluence of a healthy ecosystem, sustainable economy and vibrant community.

The Deschutes River Alliance recognizes that the lower Deschutes River (Towarnehiooks) runs through the traditional and current lands of the Confederated Tribes of Warm Springs, Cayuse, Umatilla, Walla Walla, Tenino, and many other Nations. We offer respectful recognition to the Native communities in our region and the importance of the river in their communities and cultures.

Our Mission

The Deschutes River Alliance is a science-based advocacy organization seeking collaborative solutions to the threats facing the Wild and Scenic Deschutes River and its tributaries. We advocate for cooler, cleaner water, a healthy ecosystem, and the recovery and protection of robust populations of resident and anadromous fish.

Our Vision

A lower Deschutes River that is the confluence of a healthy ecosystem, sustainable economy, and vibrant community.

Board Message

To Our Supporters,

2023 is rapidly coming to a close when it feels like we just rang it in last week. Is it just me or do the years seem to pass faster every year? That sure seems to be the case!

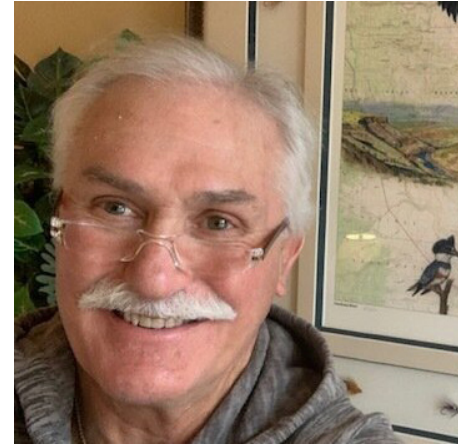
Sarah and her team have done a terrific job of recounting the last year's accomplishments here at the DRA so I won't attempt to add to it. Needless to say it has been a very busy year.

A year ago my year-end message was about our pivot from being lawsuit managers to an organization focused on outreach and education around the issues facing the lower Deschutes. We have made a lot of progress, but this has been, and remains, a work in progress with lots of moving parts. Sarah has added different skills to her team, which were needed for this new direction. Organizationally we are embracing a different mindset and tactics.

As you have probably sensed, we have become more aggressive in calling out indifference and inaction wherever we find it and we will continue to do so. Our river is not served well by either. Change is hard, but we are committed to doing the things necessary to seeing the Deschutes treated with the respect that it deserves.

Lastly, and very importantly, I want to say thank you to each and every one of you: our donors, supporters, volunteers, for standing with us in this fight to return the mighty Deschutes to what it can be. Myself, and the entire DRA organization appreciate you every day. There is more work to do and together we'll get it done.

I'm wishing all of you the greatest holiday season ever. May you all be happy and safe!



DAN ELLIS
BOARD PRESIDENT

WHAT'S NEW WITH THE NEWSLETTER?

We started with a clean slate to design this new edition and incorporate some elements that we hope you, our readers, will find helpful and informative:

- 100% recycled content paper
- Re-design for better readability
- More basic DRA info + resources

Thanks for following along as we evolve.

Get the Latest News



Receive timely updates and in-depth articles straight to your inbox. Scan the QR code to sign up.

Meet the Team



PETER ANDERSON

DEVELOPMENT MANAGER

Born in Eugene, Oregon, Peter grew up rafting throughout the Pacific Northwest. After graduating from the Clark Honors College at the University of Oregon, his career took him to Germany and back, working on strategic development and sponsorship for elite sporting organizations around the world. When he is not doing development work, he gets back to his roots guiding white water rafting trips on the Deschutes, Rogue, and White Salmon rivers.



STEVE HAWLEY

COMMUNICATIONS MANAGER

Steve Hawley is a writer and filmmaker. In May of 2023, his book *Cracked: The Future of Dams in a Hot Chaotic World*, was released by Patagonia Books. In 2019, he co-produced and wrote *Dammed to Extinction*, a feature-length documentary depicting the struggle of salmon-dependent killer whales in the Salish Sea. When not writing, Steve likes to fish, float, and play around on rivers. He lives in Hood River.



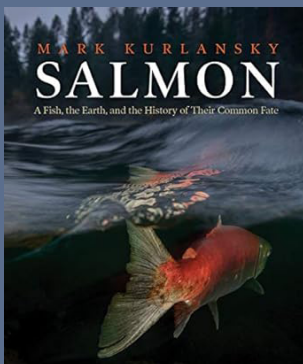
THOMAIDA HUDANISH

OUTREACH COORDINATOR

Thomaida Hudanish has worked with numerous nonprofits. Spending most of her life in the Willamette Valley and on the coast, she was introduced to the beauties of Central Oregon through annual rafting trips on the lower Deschutes. In addition to time with friends and family, her interests include design, pilgrimage, bouldering, reading, and filmmaking. She recently finished her first short documentary about a 20th century saint from Patmos.

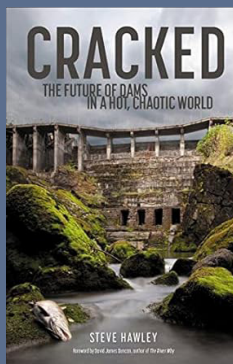
Recommended Reading

Check out these titles to learn more about issues affecting water quality and Western watersheds.



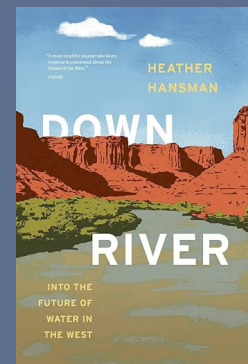
Salmon: A Fish, the Earth, and the History of Their Common Fate

by Mark Kurlansky



Cracked: The Future of Dams in a Hot Chaotic World

by Steve Hawley



Down River: Into the Future of Water in the West

by Heather Hansman

A Common Sense Solution continued from front page...

agree, is not what current operations are—but it’s what they should be. It would release the maximum amount of bottom water (60%) 365 days a year, with the exception of March 15 to June 15, during the night, when 100% surface water would be released to facilitate the surface current in the reservoir needed to attract juvenile fish out migrating during this time to the collection facility at the tower.

Night Blend, we can all agree, is not what current operations are—but it’s what they should be.

Good science tells us the Night Blend is our best shot in the short term for providing cooler cleaner water in the lower Deschutes. But honestly, we’re short on allies needed to make it happen.

PGE convened a stakeholder process, which began nearly two years ago under the guise of participating in a forum to “to identify cold water release scenarios that could be modeled for the lower river.” Stakeholders included NGOs, state agencies, and a few individuals.

At one of the meetings, DRA made a direct request of PGE that the Night Blend be used for 3 years to determine if it would benefit the lower Deschutes River. When this request was made, all other stakeholders—including

one who committed to support the request—remained silent. That made it easy for PGE to refuse the proposal. At the stakeholder group meetings, PGE deemed the Night Blend scenario “not recommended at this time,” with very little explanation as to why they would not move forward with it and no indication of when they might consider it.

Environmental advocacy is a little like showing up for church on Sunday. It’s one thing to say you care, it’s quite another to get up, get dressed, and put your rear end in the pew. It is time for all NGOs claiming to care about the Deschutes to show up. Our message to them is a simple request: support operational changes of the Selective Water Withdrawal Tower. The DRA is convinced that the Night Blend will be a major step in the right direction for the future of the lower Deschutes River, and could be implemented without major costs or negatively affecting the reintroduction effort.

Alone, we can’t convince PGE that this is the right solution. We’ll need the passionate commitment of everyone who cares about the river to raise their voices. NGOs and every other constituency that cares about the lower Deschutes River can help make this change happen.

As the Executive Director of the DRA, if there’s another solution worth investigating—technical, political, or otherwise—I’d sure like to know about it. Give me a call or drop me a line.❖



**2024
SATURDAY
JUNE 1
MAUPIN, OR**

SAVE THE DATE

AQUATIC LIFE RULEMAKING PROCESS

The DRA was active in the process and engaged the public in DEQ's recent Aquatic Life Rulemaking process. All of our voices were heard and DEQ will not be relaxing the pH standard on the Crooked River and Trout Creek. More information and next steps will be shared soon.

STAKEHOLDER PROCESS

Portland General Electric's recent stakeholder process accomplished one thing: it confirmed that the Deschutes River Alliance is the only NGO fighting for the lower Deschutes River and changes in Selective Water Withdrawal Tower operations. DRA was the lone voice in the room asking PGE to give the river immediate relief by releasing colder water year-round from the bottom of the reservoir behind Round Butte Dam. The Deschutes River Alliance will continue to fight for changes that will actually result in significant benefits to the lower Deschutes River.

2023 FRANK MOORE CONSERVATION AWARD

Our organization was proud to be honored by Fly Fishers International Oregon Council for "an extraordinary contribution to the conservation of our fisheries." The award was presented at the Northwest Fly Tyer and Fishing Expo in March 2023. Frank Moore was a celebrated WWII veteran, fly fishing legend, and conservationist who, together with his wife, worked and lived on the North Umpqua River until his passing in January 2022. Today the Frank and Jeanne Moore Wild Steelhead Sanctuary now protects approximately 100,000 acres of public lands in the North Umpqua watershed.

OUTREACH

DRA staff and board participated in partner events throughout the state—from river clean-ups to fly fishing expos—communicating our issues and goals, and expanding our audience.

WATER QUALITY MONITORING

This spring the DRA successfully installed new monitoring equipment at our location near Warm Springs and established a new station in Maupin. Both stations have the capability to transmit water quality data as it is collected to our website every ten minutes. Visit our website to see the current river conditions.

STATE OF THE LOWER DESCHUTES WEBINAR

In April, the DRA science team presented an overview of the current condition of the lower Deschutes. This is the most comprehensive overview of the lower Deschutes River's water quality and aquatic life. It is available on our DRA YouTube channel to view.

PUBLISHED OUR 9TH ANNUAL SCIENCE REPORT

This past spring, the DRA science team released the ninth Lower Deschutes River Water Quality Report. Findings were consistent with past years—the science showed again that the current operations of the SWW Tower intentionally warms the lower Deschutes River during critical spawning and incubation periods for resident trout and steelhead. High pH levels continued to exceed Oregon water quality standards throughout the monitoring period in 2022 but showed an immediate improvement with increased bottom-draw.



2023 Frank Moore Conservation Award



2023 Auction in Portland



Troutfest in Maupin, Oregon



Trout Whisperers panel at Patagonia Bend

2023 AUCTION

Inclement weather did not stop our supporters from demonstrating their passion for protecting the lower Deschutes River at our February 25th Auction in Portland. We packed the house with a record crowd of 230 and continued the tradition of raising our paddles—and our glasses—to ensure cooler, cleaner water in the lower Deschutes River.

FIRST ANNUAL TROUTFEST

Lovers of the Deschutes from around the region descended on Maupin Saturday, June 3rd for an eventful, informative, and congenial day of all things trout. The all-day festival offered introductory fly fishing lessons and kid’s casting courses, demos from legendary figures in the fly fishing industry, and a thrilling casting competition. We concluded with a concert and barbeque. This proved a great opportunity to reconnect with long-time supporters and welcome many new faces to participate in our advocacy work.

TROUT WHISPERERS—SOLD-OUT IN PORTLAND & BEND

In April, we launched our Trout Whisperers series to bring anglers closer to the treasured resource they love and communicate the avenues available to protect it. Standing-room-only crowds packed venues in Portland and Bend to hear from a handful of the most respected “Trout Whisperers” in the Pacific Northwest. Scott Richmond reminded us: “Be an observer [...], and enjoy your surroundings. It is not just about catching fish. Enjoy everything about it. We live in an absolutely stunning natural world. The more you know about it, the more you are going to enjoy it...” and, we might add, want to protect it.

Macroinvertebrate

Studies



Update

BY RICK HAFELE

The DRA has continued its studies of the aquatic insects in the lower Deschutes River, something no one else is monitoring including PGE, state or federal agencies, or any other NGO.

Samples have been collected at two sites (1 - just above the Warm Springs boat ramp; and 2 - Kaskela) in June 2021, May and October in 2022 and October in 2023. In October 2023 we also added an additional sampling site just below Maupin.

The field sampling and lab methods used are consistent with DEQ and EPA approved protocols. Lab results from the 2023 sampling

have yet to be compiled, but when they are available we will be releasing a comprehensive report of all data we have collected since 2015. A previous report of this work is available in our 2015/2016 Benthic Invertebrate Report.

The health and condition of the aquatic invertebrates is important for several reasons:

1. They form the bottom of the food chain for all fish in the lower Deschutes.
2. They are a critical part of the food chain for terrestrial life including many species of birds like swallows, nighthawks,

Left: Mahogany Duns once occurred in good numbers in the spring and fall but are now rarely seen at any time of the year.

and songbirds, as well as bats and other animals that live along the river.

3. They are sensitive indicators of water quality and are the primary community sampled to determine if aquatic life is adequately protected under Oregon's Biocriteria water quality standard.

4. They are the dominant component in the diet of rainbow trout and imitating them with appropriate fly patterns is the primary tool fly fishers use to catch trout.

PGE has argued that current water management at the SWW Tower has been good for aquatic life in the lower Deschutes River. Nothing in the results we have collected supports this claim. Results to date show:

- A decline in mayflies sensitive to poor water quality. For example, Mahogany Duns (*Paraleptophlebia* sp.) and Pale Evening Duns (*Heptagenia* sp.) have declined substantially since tower operations began.
- Stoneflies also show a general decline. Yellow sallies (*Isoperla* sp.) have notably declined, and even salmonflies

(*Pteronarcys californica*) and golden stoneflies (*Hesperoperla pacifica*) appear less abundant.

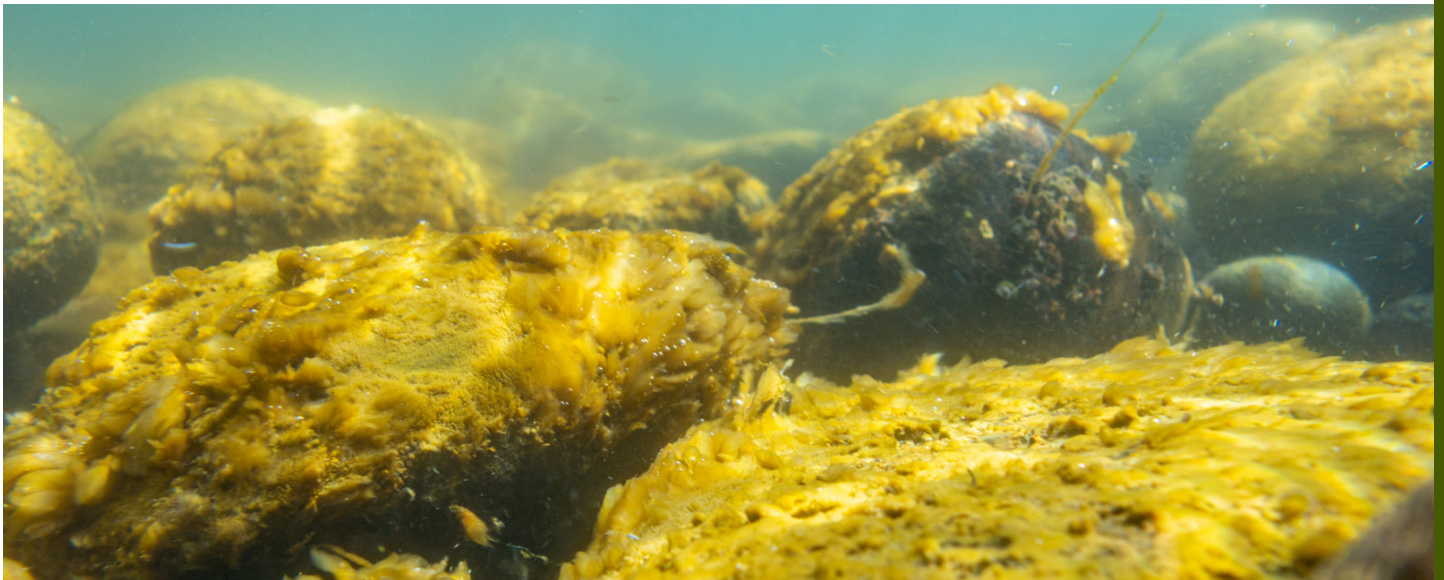
- Caddisflies continue to be one of the more common aquatic insects seen flying along the river, but since tower operations began they no longer occur in the truly dense swarms once common throughout the summer.

- At the same time an overall increase in pollution-tolerant taxa such as worms and snails has been widespread.

- An overall shift in aquatic insect life cycles have pushed the majority of what mayfly, stonefly and caddisfly adult activity there is into a short period of time from mid-April to mid-June.

- Finally, snails that provide the intermediate hosts for the parasite causing black-spot disease in rainbow trout and the polychaete worm, which is the intermediate host for *Ceratanova shasta* a serious and often lethal pathogen of Chinook salmon, have shown large increases. ❖

Below: The brown algae shown on the rocks isn't suitable as food for aquatic insects thus degrading their food resources and habitat. The proliferation of this algae has been one of the side effects of the tower's operation because of the high nutrient content of surface water in Lake Billy Chinook that is now released into the lower Deschutes.



In this issue of the Deschutes River Alliance's newsletter, we've condensed a wealth of information on water quality in the lower river, offering our supporters a summary of what's wrong with the water, and more importantly, how it can quickly be made right.

WHAT IS THE SELECTIVE WATER WITHDRAWAL (SWW) TOWER?

The SWW is a 270 foot tall, 30 foot-diameter tube, submerged in the forebay of Lake Billy Chinook. Ports at a couple strategic locations along its height allow Portland General Electric's Project managers to blend water from two depths in the reservoir, near the surface and near the bottom. The rationale for these "blends," PGE claims, is to mimic a more "natural" thermal regime as well as provide a current in the surface of the reservoir that attracts out-migrating juvenile salmon and steelhead to the fish collection facility near the SWW Tower.

PGE spent \$140 million on the SWW Tower, and in one sense it has served its purpose: the Federal Energy Regulatory Commission, which issues mandatory licenses for privately-owned dams, approved the tower's design in the early 2000's, deeming it worthy of the federal requirement for fish passage at the Project. PGE needed the tower to get its license, and it got one, good through 2055. Yet in a larger sense, the tower has been a colossal failure. Not only has it passed few salmon or steelhead above the project, but the change in flow regimes has also made water quality in the lower river much worse, with devastating consequences.

Prior to SWW Tower operations, which began in late 2009, all water released from Lake Billy Chinook was from the bottom of the reservoir, 246 feet below the surface. Of the three rivers that feed into the reservoir, the Metolius is coldest, and since colder water is more dense than warmer water, the former sinks to the bottom of the reservoir. It was this Metolius water, some of the cleanest and coldest of any

river on the continent, that primarily fed the lower Deschutes during the first 50 years of the dam's operation.

PGE claims this year-round flow of cold water created artificial conditions in the lower river, and the current flow regime more closely resembles the flow and temperatures prior to the construction of the three dams that make up the Pelton-Round Butte Complex. But the current blend, for eight months out of the year, is 100% surface water from Lake Billy Chinook. Warm and loaded with agricultural runoff, after a decade of surface water flows from the SWW, the river is now artificially warm and contaminated with excess nutrients the vast majority of the year, and as a result, lacking the diversity and abundance of life that thrived on the lower river before 2010. By contrast, prior to Tower operations, the lower Deschutes River may have been artificially cold, but it was truly clean, healthy, and conducive to the wide array of aquatic life that had blossomed there.

In the original Water Quality Monitoring and Management Plan (WQMMP), 100% bottom water release was included in the original Tower blends. However, due to an unspecified operational limitation of the SWW Tower, it can only release a maximum of 60% water from the bottom of the reservoir. This limitation, brought on by errors in construction or design, drives many of the false claims made by PGE officials about temperature management.

TEMPERATURE: WPT?

The Deschutes River's pre-Pelton Round Butte Project conditions during the 1950s were not optimal. This was true of waterways around the state of Oregon. Environmental laws and policies were anemic to non-existent, and a century

of grazing, mining, logging, and dam building had taken its toll. Yet PGE’s Project operators are touting temperatures from this bygone era as the river’s “natural” baseline. Worse, the model that PGE uses to calculate what they call “without project temperature,” (WPT) is flawed. It uses maximum daily temperatures for both air and water to calculate the target temperature for the river. If the model had been designed to reflect reality on the river, mean or even minimum temperatures would be more accurate. In the meantime, the target temperature spit out by PGE’s model is artificially high, predisposing the river to being artificially hot.

Existing water quality data reveals water quality conditions are not more “natural” in the lower Deschutes following SWW Tower operations. On the contrary, deteriorating river conditions following Tower operations show that the current state of the lower Deschutes River is in need of much improvement in order to meet water quality standards and heal the lower Deschutes.

Increasing water temperatures in the river for the majority of the year, with only minor cooling for a short period in the fall, is not an improved condition nor healthy for the lower Deschutes River. But that management scheme is precisely what PGE touts as “natural.” The amount of cooling in the fall is very small in comparison to the warming that occurs the rest of the year.

Deteriorating river conditions following Tower operations show that the current state of the lower Deschutes River is in need of much improvement in order to heal.

The beneficiary of this flow regime, claims PGE, is fall Chinook. PGE claims the brief period of cooler water protects and enhances the spawning of adults and the rearing of juvenile salmon. But there’s no scientific evidence to back this claim. A temperature study on the lower Deschutes published in 1999 found no significant difference in early salmonid life cycle timing caused by temperature changes from operation of the Project compared to pre-dam conditions.

Fall Chinook return numbers in the lower Deschutes do not support the claim of any benefit to them from an effort to save cold water. A thorough analysis conducted by the DRA of fall

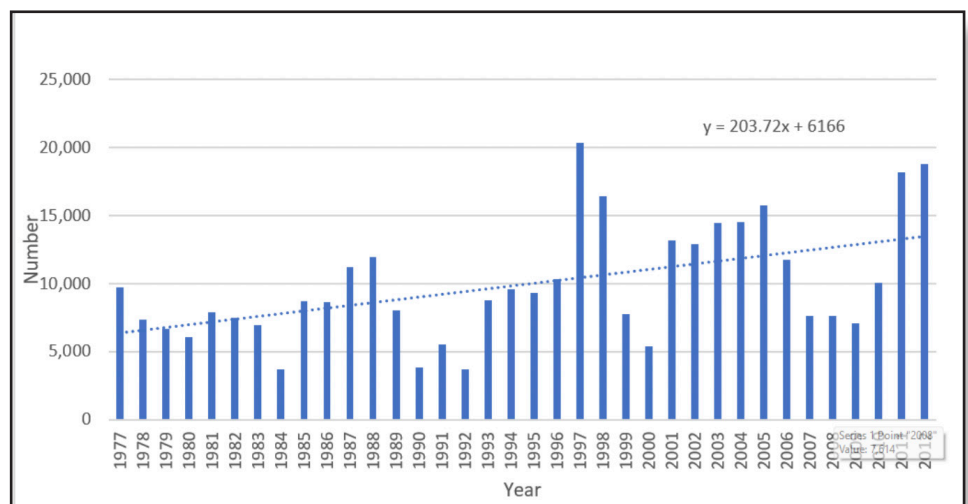


Figure 1. Fall Chinook returns pre-SWW Tower.

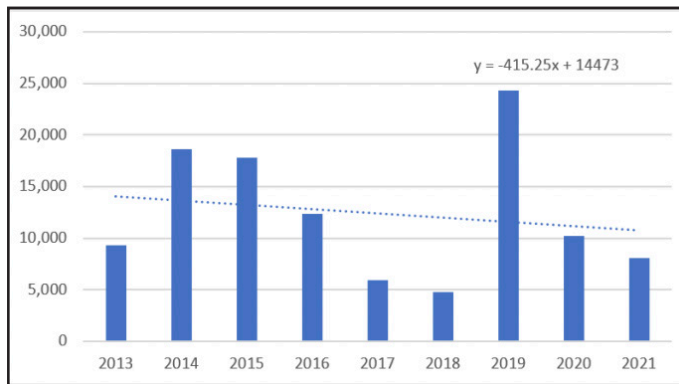


Figure 2. Fall Chinook returns post-SWW Tower.

Chinook return data, indicated that post-Tower years 2013-2021 were not significantly different when compared to the previous 36 return years, 1977-2012. Interestingly, comparing these same two time periods, fall Chinook showed a positive trend in the pre-Tower years and a negative trend in the post-Tower years through 2021.

Another rationale for the WPT flow regime is the need to save cooler water, supposedly because the supply of it is limited in the reservoir. Again, there is no evidence to back this claim. A comprehensive water quality study of the Project and lower Deschutes, funded by PGE, analyzed the temperature profile in Round Butte forebay. The authors of this study found Tower operations in the forebay have led to more cold water in the deeper portion of the reservoir during mid-summer months.

However, under the current conditions even when maximum bottom water is released, bottom water must be mixed with at least 40% surface water, which is warmer from mid-March to September. So when bottom water is mixed with warm surface water, the water released into the lower Deschutes River is warmer during the summer months than it was prior to tower operations, when 100% bottom water was the only option. The little cooling relative

to pre-Tower conditions in the fall is disproportionate to this warming.

Violations of the temperature standards set in the lower Deschutes to protect aquatic life (principally spawning salmonids) have increased following Tower operations. While violations of the lower Deschutes temperature standards did occur prior to Tower operations (0-5 days annually), the number of days in violation of temperature standards increased substantially following Tower operations (2-36 days annually). This is indicative of the overall warming trend post-Tower operations, which has contributed to the well-documented negative ecological shifts that have occurred following Tower operations.

PH AND NUTRIENT LOADING

pH levels in the lower Deschutes tell the story of how river conditions have declined following tower operations.

WHAT IS PH?

pH is a scale used to specify the acidity or basicity of a liquid. As an example, things with a lower pH, like grapefruit juice and vinegar, are acidic, while things with a higher pH, like bleach and drain cleaner, are basic, or alkaline. A pH level of 7 is neutral, a pH less than 7 is acidic, and a pH greater than 7 is basic. The optimal pH range for most aquatic organisms is within a couple of units above and below 7 (neutral) pH.

Since the DRA started continuous water quality monitoring in 2016, most monitoring days have been in violation of the maximum standard of 8.5 set by Oregon Department of Environmental Quality (ODEQ) to protect aquatic life. Most pH violations have occurred from April through October. The number of pH violations has increased drastically following

the commencement of SWW Tower operations. Furthermore, many of the daily maximum pH values are not only above the Oregon Department of Environmental Quality maximum standard of 8.5, but approach and even exceed 9.0. pH levels higher than 8.5 increase the toxicity of pollutants such as ammonia and heavy metals. pH levels of 9.0 or above are likely to harm salmonids, and any prolonged level above 9.5 is lethal to salmonids. While a level of 9.5 has not been observed by the DRA, daily maximum values regularly exceeding 9.0 is cause for concern.

Another way to think of pH is as an indicator of plant growth in the river. As algal growth increases from added nutrients—fertilizers laden with phosphorous and nitrogen, and manure from farms—the chemical reactions from photosynthesis cause the concentrations of hydrogen ions in the water to decrease, which causes pH levels to increase. Increased algal growth of certain species now prevalent in the lower Deschutes also reduces the habitat and food sources of macroinvertebrates. Increasing nitrogen levels in the water results in increased algal and aquatic plant growth.

Of the three tributaries feeding Lake Billy Chinook, the Crooked River is highest in nitrogen levels, followed by the middle Deschutes, primarily due to the relatively high agricultural use in these two basins. The DRA science team has collected samples and studied nutrient levels at the mouths of each tributary to Lake Billy Chinook since 2015. All show the same nutrient pattern as similar studies performed in the basin, with the Crooked River contributing the most nitrogen to Lake Billy Chinook, followed by the Deschutes River. These tributaries, which are warmer and sit on the surface of the reservoir for much of the year relative to the cold Metolius River, are now released

directly into the lower Deschutes River through 100% surface draw that occurs 8-9 months out of the year.

The only realistic explanation for the increase in pH after 2009 is SWW Tower operations.

In 2022 alone, DRA's data shows 170 days that pH levels violated the 8.5 standard.

A comparison of long-term pH data collected by Oregon DEQ in the lower Deschutes at the Warm Springs Bridge from 1989-2022 shows an immediate and sustained increase in exceedances of the 8.5 standard upon commencement of SWW Tower operations.

Since the SWW Tower began operation, pH levels have risen in the lower Deschutes River and have consistently exceeded Oregon's 8.5 maximum standard. In 2022 alone, DRA's data collected at river mile 99.7 (approximately 0.3 miles downstream of the reregulating dam) show 170 days that pH levels violated the 8.5 standard out of 234 days of data collection. Unfortunately, this has been the norm since the DRA started collecting seasonal continuous pH data in the lower river starting in 2016.

The increase in overall algal growth and the proliferation of two nuisance diatom species that create a thick slime-like layer on rock surfaces are significant impediments to the life cycle of any aquatic insect that crawls on rocks for a portion of its life cycle. Studies on the macroinvertebrate and algal communities by PGE and the DRA have shown a decrease in pollution-sensitive macroinvertebrates such as mayflies, stoneflies, and some caddisflies and

an increase in pollution tolerant species such as worms and snails.

Many of these pollution-tolerant species serve as intermediate hosts for fish pathogens, including *Ceratonova shasta*, which can cause high mortality in Chinook salmon. The increased algal growth and shift in species composition has caused a ripple effect in the macroinvertebrate community (i.e. aquatic insects) and, by extension, the rest of the ecosystem, including fish.

Despite continually higher pH levels coming out of the Project relative to the three tributaries and continual violations of the pH standard in the lower Deschutes following tower operations, operators have yet to come up with a pH management plan, and enforcement agencies have turned a blind eye.

WHAT ABOUT THE FISH... AND WILDLIFE?

Fish reintroduction—the primary goal of installing the SWW Tower—has been a dismal failure. In 14 years of tower operations, 389 combined adult and jack spring chinook can be credited to the reintroduction effort, alongside 536 steelhead, and 1,004 sockeye, half of

which returned in one year, 2016. Worse, the severe decline in water quality puts at risk the future or resident trout, wild steelhead, and Chinook that spawn in the lower river. Black spot disease has proliferated in trout, due to the shift in diet from insects to snails and worms. Spring Chinook are in deep trouble.

Wild spring Chinook numbers have dwindled to such disturbingly low numbers that extinction now looks more likely than survival—unless significant changes are made in the very near future. The decline of springers in the Deschutes correlates with tower operations. *Ceratonova shasta* is a parasite that kills spring Chinook via spores that, when released into the water column from tiny polychaete worms, infect Chinook on contact. Prior to tower operations, *C. shasta* was present in the Deschutes, but in very low numbers. Post-tower operations have fostered a deadly, manifold increase of this parasite, frequently at levels presumptive for infection.

A widely accepted benchmark for the viability of any salmon population is three hundred individuals. Springers in the Deschutes have not met this minimum number for the past six years. The quarry most coveted by anglers, however, on the lower Deschutes is wild steelhead. As Figure 4 indicates, the current trend line is headed toward zero for steelhead as well. Don't panic: this doesn't mean there will be no wild steelhead in the river next year. But it does mean that if the current trend continues, there won't be enough wild steelhead in future years to maintain the species in perpetuity. The life cycle of wild steelhead, in which one to four years is spent in a freshwater environment, places a premium on cold, clean water in the Deschutes River.

It's often pointed out that Pacific salmon are in trouble throughout their range. But this trouble is exacerbated on the Deschutes by a

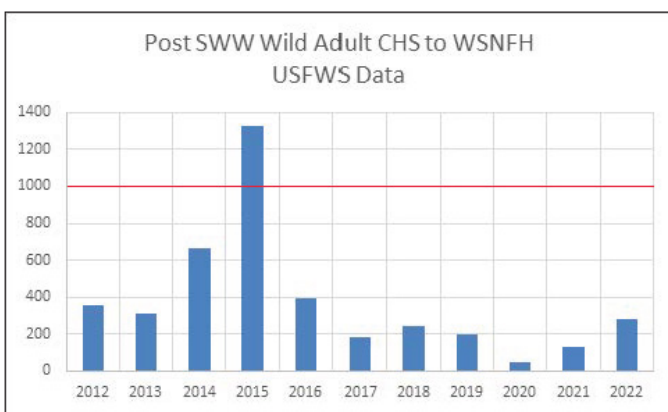


Figure 3. Post Selective Water Withdrawal Tower returns of spring Chinook on the Deschutes River, 2012-2022. Red line indicates the goal of 1,000 fish annually.

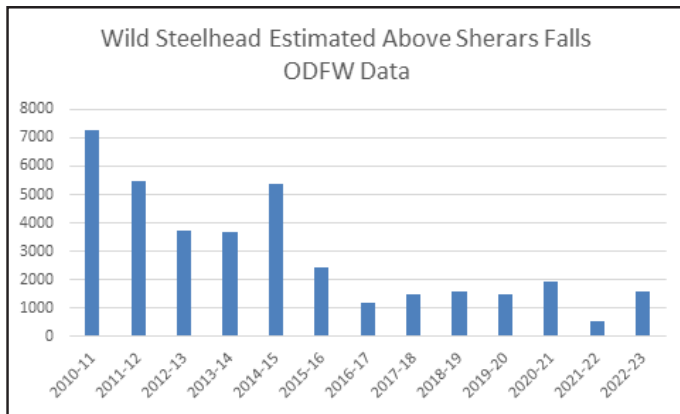


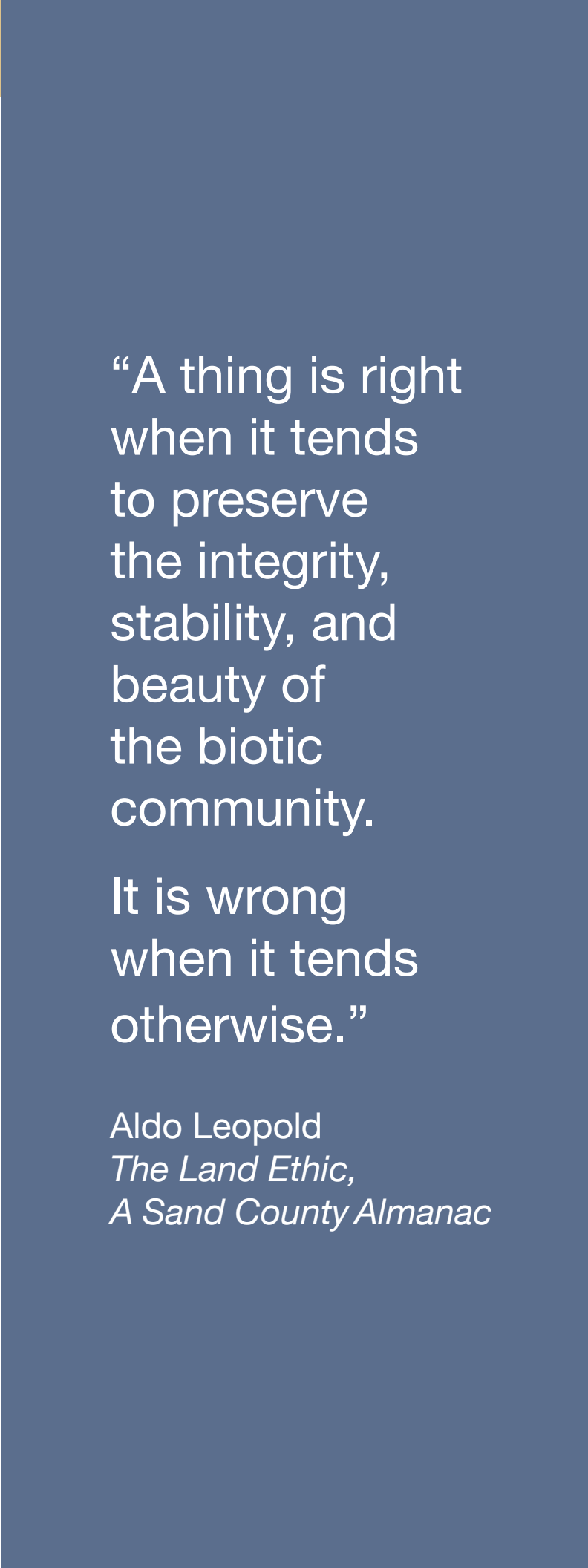
Figure 4. Post-SWW Tower returns of wild steelhead to the lower Deschutes River.

management regime that puts warm, polluted water into the lower river eight months out of the year. The consequences of this dirtier water have been a wide range of ecological impairments, from the loss of sensitive aquatic insects, drop in song bird and swallow numbers along the river, to the declining population trends for salmon and steelhead.

WHAT CAN BE DONE?

Elsewhere in this newsletter, you’ve read about recent wins the DRA garnered via the Oregon Department of Environmental Quality’s Rule-making process. Long story short, we’re holding the line on further declines in water quality. And there is a way out of this mess: PGE’s own water quality report suggests a “Night Blend” scenario, in which 60 percent bottom draw would flow into the lower Deschutes for the majority of the year. This would go a long way to restoring the river we all love. ❖

This article is a distillation of several of DRA’s 2023 blog posts. For a more in-depth analysis of water quality issues on the Deschutes, complete with graphs and charts, please refer to the our blog.



“A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community.

It is wrong when it tends otherwise.”

Aldo Leopold
The Land Ethic,
A Sand County Almanac



5520 S Macadam Avenue, Suite 200
Portland, Oregon 97239

info@deschutesriveralliance.org
www.deschutesriveralliance.org
503.224.0657

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