

STRONG RUNS

NATIVE FISH SOCIETY / NATIVEFISHSOCIETY.ORG / WINTER 2020





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LAYOUT & DESIGN

Jessica De Boer



“Progress is impossible without change, and those who cannot change their minds cannot change anything.”

—GEORGE BERNARD SHAW

COVER

A #keepemwet collage from our Instagram photo contest this summer. Thank you to everyone who participated!

ABOVE

The osprey demonstrates another way to rise up for wild fish. Photo: Dave McCoy

WHAT CHANGES & WHAT REMAINS

“**W**hy do wild fish matter to you?” I asked our longtime River Steward, former board chair, and friend, Peter Tronquet. For the life of me, I cannot remember where we were or what we were doing, but Peter’s words stuck with me.

“I value wild fish because I value clean water and clean air. In the Northwest, wild, native fish are a core element of a healthy environment.” It’s as simple as that.

At the time, some ten years ago, I was freshly immersed in the science and policy history of Northwest fish as a new employee. Wading through the immense body of scientific research on dams, hatcheries, overfishing, habitat loss, genetics, and ocean conditions felt akin to sliding over slick bedrock in murky water searching for surefooting. The sheer volume of information was hard to register. Don’t believe me? Take a friend newly interested in fish conservation to speak with a lifelong wild fish conservationist like Bill McMillan. You can watch their mind spool deep into the backing in about 15 minutes. There’s just too much to digest in any one sitting.

Mercifully, Peter’s answer reminded me of leaning over the railing on Mott’s Bridge high

above the North Umpqua River where many times I’ve peered down through a translucent window of clear water to recognize the shadow on the bottom is not a log but a shimmering wild fish. Peter’s values-based answer was high ground where I could reset my bearings and recognize the central role wild anadromous fish play in the health of this wondrous place and in our communities. Data and science are critical, ever refining guides for our advocacy, but the central tenets of our work stem from deeply held values.

Why bring this up now? Undoubtedly, 2020 has left many of us feeling unmoored during this year’s tidal waves of change. For posterity, a short list includes a global pandemic that has killed 250,000 US citizens, a nationwide racial reckoning over the systemic injustices facing the Black community, an economic recession, and here in the Northwest, record breaking wildfires driven by climate change. I want to take a page from Peter’s example and anchor ourselves in the core values that guide Native Fish Society’s work and advocacy through this tumultuous time and in the years to come.

WILD, NATIVE FISH ARE A KEYSTONE SPECIES. They are uniquely entwined in a natural relationship with people and wildlife. Their well-being and success affect us all.

WORDS

Mark Sherwood,
Executive Director

ABOVE

Advocacy for the ecosystems that sustain us all.

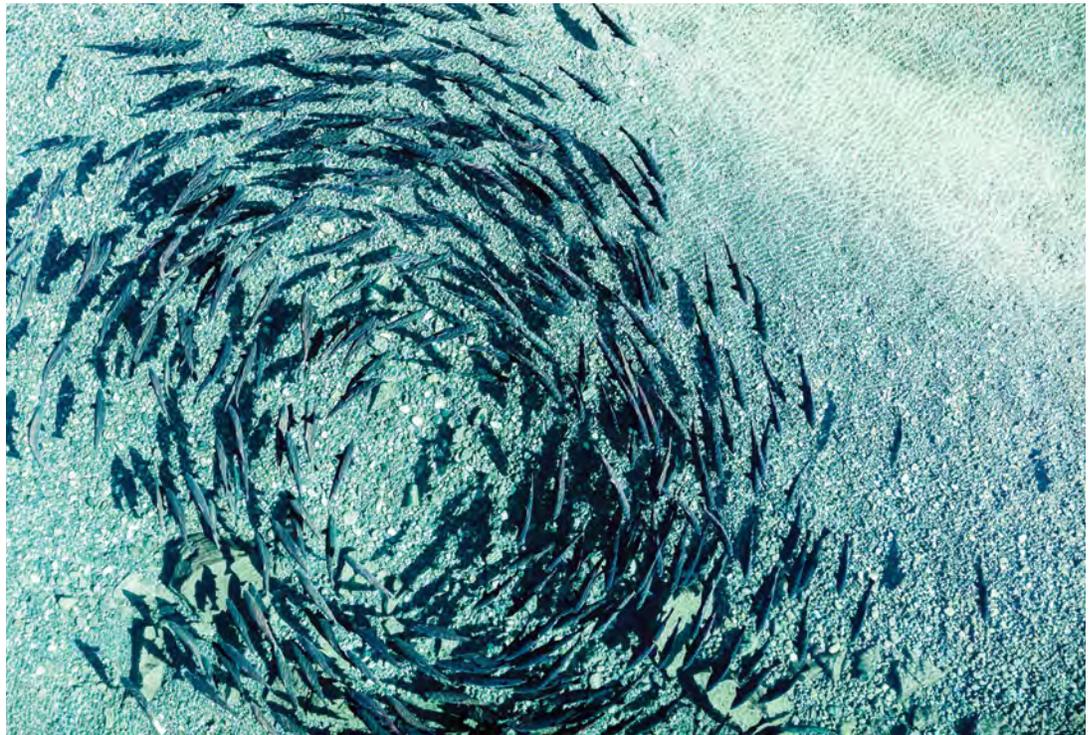
Photo: Chase White

**MESSAGE
FROM THE
EXECUTIVE
DIRECTOR**

RIGHT

Advocacy for what native fish need to thrive.

Photo: Chase White



A romantic notion holds that the Northwest is everywhere that salmon and steelhead can swim. When these fish are abundant and healthy our oceans are rich with life, our streams and rivers are full of clean water, our forests sequester carbon, clean the air we breathe, and filter the rain, and our communities thrive in a healthy and abundant Northwest. When our wild fish falter, we know that we're fighting to revive not just the fish, but the 137 species of microbes, stream invertebrates, mammals and birds they support - including us. For this reason, we're passionate about returning as many native fish to landscape as possible.

WILD IS OUR COMMON GROUND. Anglers, conservationists, naturalists, outdoor enthusiasts, foodies & foragers, educators, scientists, policymakers, and traditionally underrepresented communities all have an important role to play in the future of wild fish.

Native Fish Society's voice is strongest when we include all of the people who care deeply about wild fish and our homewaters. We love our roots in the science, angling, and conservation communities, and we're working intentionally to invite more folks in through our partnerships with Tribal Nations, BIPOC led organizations,

and our Women for Wild Fish Initiative. We are all essential members of the groundswell for reviving abundant wild fish.

WE ARE KEEPERS OF THE WILD. Native Fish Society supports people who take action on behalf of fish, their homewaters, and local communities. We forge lasting relationships to educate, inspire, and mobilize everyone committed to keeping fish and their homewaters forever wild.

What many people don't realize is that by and large, history's most significant conservation victories started from small groups of concerned community members determined to make a difference. Empowering, inspiring and growing the largest most capable network of local advocates and multidisciplinary experts is what Native Fish Society's River Steward and Native Fish Fellowship programs are all about. Supporting these remarkable advocates as they work together is absolutely core to the future success of wild fish.

OUR MOTIVATIONS ARE URGENT BUT OUR VIEWS ARE LONG. Science-based knowledge and cultural wisdom inform our strategies to ensure the complex lifecycle of wild fish continues for generations to come.

**MESSAGE
FROM THE
EXECUTIVE
DIRECTOR**



LEFT TOP TO BOTTOM

Advocacy with reverence for the resilience and fragility of wild fish.

Photo: Dave McCoy

Today, most of the Pacific Northwest's wild fish populations hover at just 1-10% of their historic abundance. These fish are met by a myriad of challenges, which are only being intensified by climate change. We've run out of time for expensive band-aids like trapping and hauling fish around dams, endless hatchery programs, and restoring habitat without addressing the pace and scale of habitat degradation. Native Fish Society is committed to advancing the long term, science-based solutions to the root causes of native fish declines.

OUR PASSION FOR WILD FISH RUNS DEEP. Our mission is more than an environmental movement, it's about preserving our shared cultures.

One of the best things about this work is the people who love wild, native fish. I know them because their eyes light up when they talk about the last fish they caught, snorkeled with, saw on a redd survey, shared with friends and family around the dinner table, or prayed over as the first fish to return for the season. Native fish enrich our land and our communities and we use all of those reasons that inspire passion to fuel our collective advocacy.

Heraclitus said the only constant in life is change. And it's true for much of the Native Fish Society. Our staff, our partners, our membership, and our conservation campaigns change. What endures, however, shaping our day to day actions and long term goals are these values. I hope no matter our politics, race, color, or creed, we return to the values that unite us across difference, so we can rise up together for the revival of abundant wild fish. 🐟

Renowned wild fish advocate Bill McMillan visits with River Steward Chris Johnson.

Photo: Native Fish Society



OREGON STEELHEAD CONCERNS

It's Time to be the Squeaky Wheel

WORDS

Kirk Blaine,
Southern Oregon
Regional Coordinator
& Jeff Hickman,
Nehalem River
Steward

ABOVE

One last look
before letting go.

Photo: Jeremy Koreski

Earlier this year Native Fish Society River Steward and fly fishing guide, Jeff Hickman, approached NFS staff with his concerns about wild Winter Steelhead in Oregon's Nehalem River. "Over the past few years, runs have been bleak, I haven't been catching near the wild fish as previous years. As a River Steward, I reached out to NFS to see if there was any data to back up my concern."

Native Fish Society staff worked with Jeff and Dr. Chris Frissel, a biologist and volunteer Native Fish Fellow, to analyze data and determine population trends for Steelhead in the Nehalem River and along the Oregon Coast. A historical analysis of abundance was put together using cannery records from the early 20th century; the 1985 Oregon Department of Fish and Wildlife (ODFW) Informational Reports 89-1: Estimated Run Size of Winter Steelhead in Oregon Coastal Streams by Ken Kenaston; steelhead data from steelhead spawning surveys on the Salmonberry River; Steelhead dam counts from the North Umpqua's Winchester Dam; and Oregon Adult Spawning Inventory

and Sampling project (OASIS) data, which started conducting spawning surveys coastwide in 2003.

The evaluation strongly suggest a 90 percent ongoing decline in the Nehalem River wild Steelhead population since the 1920s. Along the entire Oregon coast, agency data suggests wild Steelhead in most rivers have been declining at a rate of 20-24 percent per decade since the 1980s. "If the average rate of decline continues," says Dr. Chris Frissel, "it puts nearly all wild coastal Steelhead populations at risk of extinction within 50 years."

Still shaken from the analysis, NFS partnered with our friends at Patagonia Fly Fish including head editor, Steve Duda, to elevate the issue of Oregon winter Steelhead declines. An action alert was created to raise community awareness. Over 500 people shared their support advocating for future research and evaluation of Oregon Coastal Steelhead by ODFW.

In September 2020, ODFW released a five year review of wild Steelhead abundance



along the Oregon Coast. This review included runs from the Necanicum River near Seaside, OR to the Sixes River near Port Orford, OR. ODFW's evaluation confirmed steady declines in abundance with three of the four coastal regions returning below critical abundance. The North Coast region (Necanicum, Nehalem, Tillamook & Nestucca populations) and mid-south coast region (Tenmile, Coos, Coquille, Floras & Sixes populations) fell below "critical abundance" levels two out of the last five years. These recent fluctuations in population abundance send multiple warning signs about the health of wild Steelhead.

On November 19th, 2020 Native Fish Society submitted a request to ODFW to list Oregon Coast winter Steelhead as a State Sensitive Species. Native Fish Society staff testified to the Commission outlining declines with Steelhead populations on the Oregon Coast. Jeff Hickman testified sharing his personal experiences on the river, asking the Commission to take action by instating catch and release limits for anglers and closing specific watersheds to angling in the Nehalem basin to protect spawning Steelhead.

Native Fish Society is discussing options with ODFW to find management solutions. We look to leverage our River Stewards and grassroots advocates to encourage management changes to promote wild fish on the Oregon coast. "We're at a tipping point and we all need to stand up and speak our minds and talk about what's important to us," Hickman explains. "I think a complaint is worth a lot more than people give it credit for. The squeaky wheel gets the grease, man." As a community, we must stand up, let our voices be heard to conserve and revive abundant wild fish and thriving local communities of the Oregon coast. 🐟

For more information on Oregon coast Steelhead declines or ways you can get more involved please contact NFS Southern Oregon Regional Coordinator Kirk Blaine at kirk@nativefishsociety.org.

ABOVE

Oregon's coastal wild steelhead need our attention and advocacy.

Photo: Jeremy Koreski



SEARCHING FOR GEMS IN CENTRAL OREGON

Protecting Bull Trout Using eDNA

WORDS

Kirk Blaine, *Southern Oregon Regional Coordinator*

ABOVE

Bull Trout and their habitats are protected under the Endangered Species Act.

Photo: David Herasimtschuk, *Freshwaters Illustrated*

Jodi Wilmoth, the Little Deschutes River Steward for Native Fish Society and a member of our Women for Wild Fish Initiative, has always worked to protect native species be they fish or frogs. Jodi has volunteered her time with numerous organizations working on conservation in wild places. During her tenure as a River Steward, Jodi has been interested in Bull Trout and exploring the possibility of whether they currently inhabit the Little Deschutes watershed in Central Oregon.

Bull Trout, *Salvelinus confluentus*, a Char native to the Pacific Northwest and Canada, were historically found in abundance in the watersheds of central Oregon. In 1998, these native fish were listed as a threatened species under the Endangered Species Act. Habitat degradation and fragmentation, blocked migration corridors, poor water quality, past fishery management practices, and the introduction of non-native species all contributed to the decline of these beloved fish.

With the advancement of DNA technology, determining their presence is possible utilizing something called eDNA. This cutting edge technology is being used to find

rare and threatened species throughout the world so Jodi figured it could be used in her own backyard.

What is eDNA? Well, eDNA is short for “environmental DNA” and refers to any DNA that is collected from an environmental sample, rather than directly from an organism. eDNA can be collected for terrestrial animals, fish, amphibians and even microorganisms. The ability to rapidly and sensitively detect the presence of a target species through eDNA analysis has enabled a wide range of scientific discoveries including presence of rare or endangered fish. This project is all part of the Rangewide Bull Trout eDNA Project being conducted throughout the Pacific Northwest.

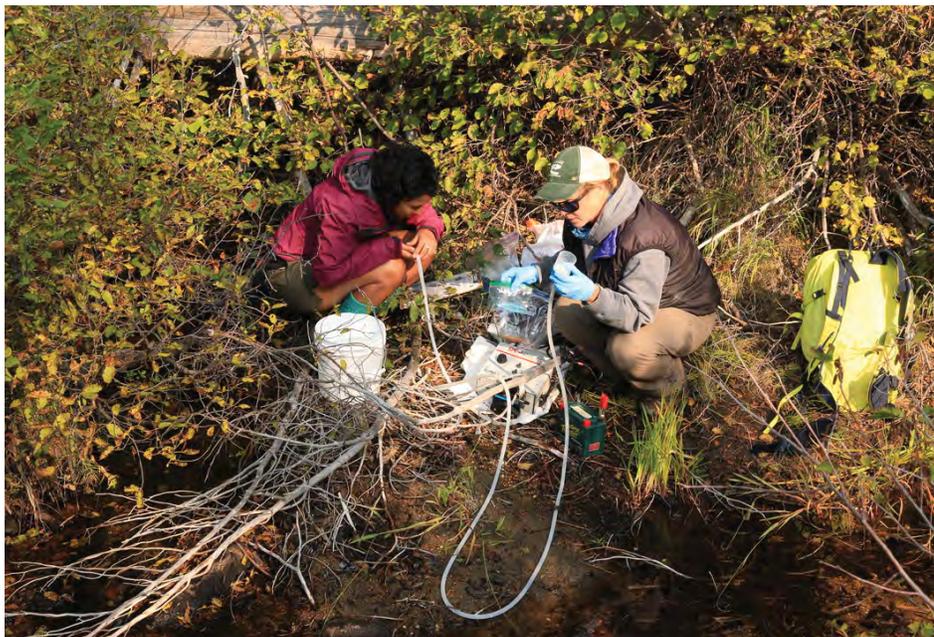
Jodi organized a project for myself and two other volunteers to travel to Crescent Lake, Oregon and assist her in collecting eDNA samples in watersheds that had the potential to hold Bull Trout. This project was a perfect opportunity to engage our Women for Wild Fish advocates. We released a post on social media asking for two volunteers to assist with the project. Along came Amy and Patricia, two women excited to learn more.

We all met near Crescent Lake on a crisp, clear fall morning. Jodi and I unloaded a large briefcase full of sampling tools including a pump, small battery, and tubing for circulating the water. Jodi gave detailed instructions on setting up the pump and how to protect the fragile filter. Jodi continued with a brief overview of what to expect throughout the day—lots of “bushwhacking” and meandering through the forest. We traveled to the first sampling site together, a small babbling brook that meandered through a culvert under a bustling train track, where Jodi and Patricia demonstrated the sampling methods. Patricia and I struck out through the sparse ponderosa pine to our assigned sampling sites. Throughout the morning and afternoon, both groups were able to collect multiple samples in the basin in the hopes of capturing eDNA from our species of interest, Bull Trout.

The day ended back at our vehicles reminiscing about the day’s adventures and the fun we all had collecting samples in Oregon’s beautiful outdoors. We discussed the results of our samples and how they will fuel the future conservation of these watersheds. Although exhausted by the many miles of hiking through the untrailed forest, it was a day of excitement and potential.

I cannot say enough about Patricia, Amy, and Jodi. Patricia and Amy showed enthusiasm for adventure, climbing through the trees and “bushwhacking” their way to sample sites. Native Fish Society is fortunate to have amazing volunteers willing to donate their time and expertise to make projects like this possible. All in all, between the people and the location, it made for the perfect Saturday working to protect the wild, native fish of central Oregon.

Native Fish Society and our Women for Wild Fish Initiative will have other events in the near future. On the ground projects promoting conservation and stewardship are one of many ways people can join our community in advocating for and promoting our mission: restoring abundant wild fish, free-flowing rivers, and thriving local communities. 🐟



For more information or if you are interested in volunteering/engaging with our Women for Wild Fish Initiative please contact Tracy Buckner at tracy@nativefishsociety.org. For more information about eDNA testing or to get more involved please contact Kirk Blaine, our Southern Oregon Regional Coordinator at kirk@nativefishsociety.org.

ABOVE

Little Deschutes exploration, eDNA sampling, and preparation to find and protect Bull Trout and their habitats.

Photo: Kirk Blaine, Native Fish Society

REWILD THE WILLAMETTE

A Resounding Win for Wild Fish

WORDS

Jennifer Fairbrother,
Conservation Director

ABOVE

One step closer to more wild Winter Steelhead in the Upper Willamette!

Photo: David Herasimtschuk,
Freshwaters Illustrated

2020 will be remembered in our collective memories as a year of upheaval in our daily, social, and political lives. In Oregon's Willamette River basin, it may just be the year that puts the Willamette's wild fish on the path to revival. A major court ruling and legislative actions have set the stage for reforming operations at the Willamette's thirteen federally owned dams to benefit and recover threatened Spring Chinook Salmon and Winter Steelhead.

A RESOUNDING WIN FOR WILD FISH

In August, Chief Judge Hernandez of the District of Oregon ruled in favor of Willamette wild fish finding that the U.S. Army Corps of Engineers (Army Corps) and the National Marine Fisheries Service (NMFS) failed to undertake the actions required under the Endangered Species Act (ESA) to recover Salmon and Steelhead in the Upper Willamette River basin. Native Fish Society, along with our partners at WildEarth Guardians and Northwest Environmental Defense Center and represented by attorneys at Advocates for the West, filed the lawsuit in the spring of 2018 after years of delays, inaction, and failure to substantively implement meaningful recovery for Spring Chinook Salmon and Winter Steelhead at the dams.

In a decisive ruling, Judge Hernandez agreed with all three legal claims we had brought against the Army Corps and stated, "Far short of moving towards recovery, the [Army] Corps is pushing the UWR Chinook and Steelhead even closer to the brink of extinction." Judge Hernandez's ruling found that the agency failed to implement critical measures required by the ESA to prevent harm and support the recovery of wild fish. In particular, he noted that the Army Corps failed to make substantive progress on juvenile fish passage and water quality, major factors leading to the ongoing decline of the species.

The court is now considering how to remedy the situation and account for the ongoing harm to wild fish. Our proposed remedies include operational adjustments that the Corps can undertake in the near term to benefit Salmon and Steelhead including reservoir drawdowns to help juvenile fish access volitional passage routes through dams, increased spill of water over dams during the spring juvenile migration season, outplanting of adult fish in the upper South Santiam basin, and operations to improve downstream water quality. Along with these measures, we have requested that the Army Corps be required to monitor and collect data to inform the long term efficacy of these



management strategies and that the work be overseen and guided by a team of independent experts focused on the goal of recovering threatened Salmon and Steelhead.

The case will now proceed through several rounds of briefings this winter followed by a hearing before Judge Hernandez in spring 2021.

**LEGISLATIVE LANGUAGE PRIORITIZES
WILLAMETTE WILD FISH**

We know that strong science and favorable court rulings aren't enough to change the trajectory of Willamette wild fish—what's truly needed is the groundswell of public support advocating for their revival. That's why we formed the Willamette Salmon and Steelhead Recovery Coalition.

This year, those efforts came to fruition when several key legislative proposals were advanced in Congress. Congressman Peter DeFazio (OR-4) included two provisions in the Water Resources Development Act of 2020 (WRDA 2020) focused on changing Army Corps operations in the Willamette to benefit wild fish recovery. The first provision will ensure the requirements and objectives of current and future Biological Opinions will be implemented in the basin with a particular focus on plans that will prioritize adequate flows, even during drought years, and secure instream water rights for fish. The second

provision directs the Army Corps to complete a report to Congress within two years evaluating deauthorizing hydropower production at Cougar Dam on the McKenzie River and Detroit Dam on the North Santiam River. Eliminating the small amount of remaining hydropower on the Willamette system is a critical component of implementing operations that can increase the number of juvenile fish able to migrate downstream of the dams.

Complementing this work are efforts by Congressman Kirk Schrader (OR-5) to ensure that funds appropriated by Congress for fish recovery projects in the Willamette River basin are not diverted by the executive branch to other purposes. This issue arose last year when funds designated for Willamette projects—like a water temperature mixing tower at Detroit Dam intended to improve downstream water quality—were redirected for other purposes. 🐟

Much lies ahead for the Willamette's iconic wild fish and our efforts to ensure that they are truly on the road to recovery. 2020 may well be remembered as the year that set a new trajectory for the basin's wild fish, rivers, and communities.

ABOVE

Big changes ahead for Big Cliff Dam and the 12 other Army Corps of Engineers dams in the Upper Willamette.

Photo: Native Fish Society



OUR SIDE OF THE MOUNTAIN

Utilizing Drones to Protect Endangered Species

WORDS

Nicholas Wagner,
Native Fish Fellow

ABOVE

Nick piloting drone
at Wilson River
landslide.

Photo: Octave Zangs

From high on the mountain, the view across the canyon is typical of the Oregon Coast Range – a patchwork of green and brown slopes, with a few narrow ribbons of trees lining the drainages. This is the heart of Oregon’s temperate rain forest in the 360,000 acres Tillamook State Forest – our forest. The nearest town on the map, Lee’s Camp, once held the record for the highest single-day rainfall total in the state of Oregon: 14.3 inches. Steep slopes are the norm here, dropping to the many forks and tributaries that are habitat for Steelhead, Chinook, and Coho. The slope below me has failed. A massive landslide started in a clearcut and plummeted 1000 vertical feet directly into the river below.

On a cool February morning in the mountains, the skies are clear – good for flying. Like Sam, from *My Side of the Mountain*, I have a flying friend with me. But my trained “bird” isn’t a falcon named Frightful. It’s a drone named Phantom, that I’ve taught to serve me, and be my eyes in the sky. Phantom will see the landslide in ways that I can’t, and bring the catch - rich data - back to me.

As a Native Fish Society Fellow working on the ‘Landslides to Logjams’ initiative, I use

my experience as a professional drone pilot to help restore abundant native fish. My goal here is to measure the impact – to what extent did this landslide change the environment, and how much sediment was delivered to the river below? Before drones made a survey like this cost-effective, it would have required an expensive manned-aircraft flight to answer these questions.

I’ve programmed my drone to survey the slide-path and surrounding area. Starting at the top of the mountain and flying a grid pattern, akin to mowing the lawn, Phantom will take overlapping photographs as it’s guided by GPS satellites down the slope. Hundreds of photos will be captured then processed. The result will be a detailed three-dimensional map that will be used to quantify the impacts of landslides on native fish.

Landslides on clearcut slopes are much larger and more frequent than slides on forested slopes. In fact, studies show that landslides occur up to 24 times more frequently after an area has been logged. The sediment loads dumped into streams by a clearcut landslide often channelize rivers, impair water quality, and either wipe-out or bury existing logjams.



TOP TO BOTTOM

Drone image of Cedar Creek landslide.

Photo: Nick Wagner

Preparing "Phantom" for flight.

Photo: Octave Zangs

Drone flight path shown in orange with photo locations in yellow over the 4.5 acre Cedar Creek landslide.

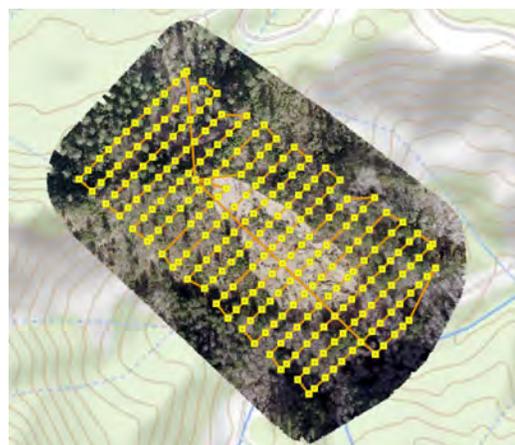
For this project, two landslides in the Tillamook State Forest were surveyed, both on tributaries to the Wilson River. The images of each landslide were processed and stitched together using powerful cloud-based software. The output is a photographic map - a giant composite image called an orthomosaic that captures the ground, trees, and vegetation in resolutions down to 1 inch per pixel. This high resolution allows individual plants, cobbles, and other small features to be seen, and distances and areas can be measured.



NEXT PAGE

Google Earth imagery of active roadbuilding in 2012 followed by the landslide event into the West Fork of the North Fork Wilson River in 2016.

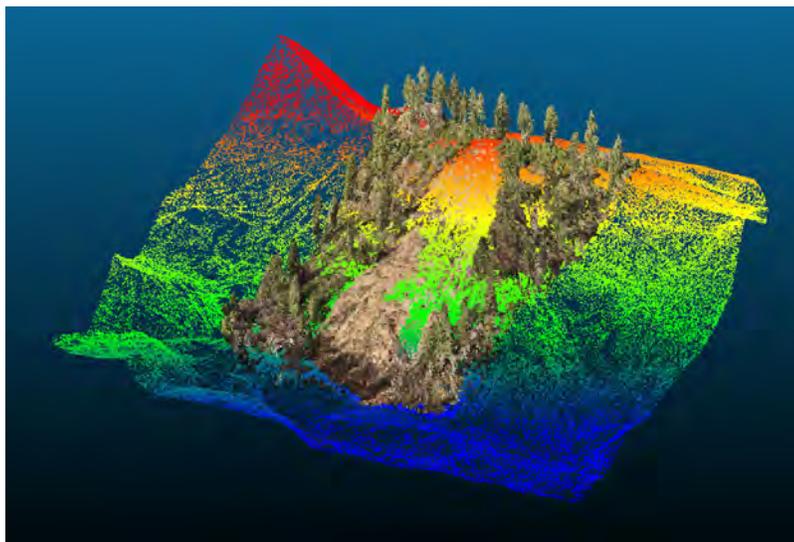
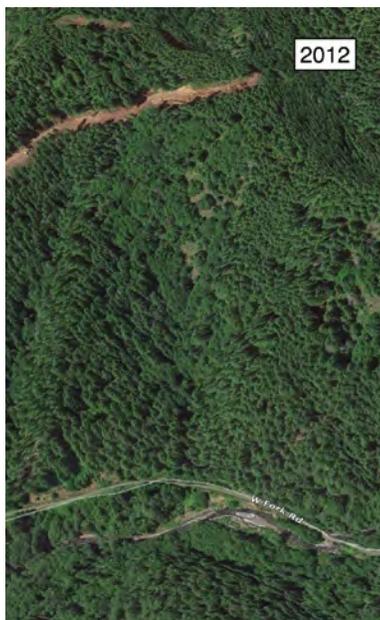
Using an additional processing step, called 'Structure from Motion', the overlapping two-dimensional images were processed to reconstruct a three-dimensional scene. For each point in the survey area, an elevation value was computed, and the whole landscape was digitally modeled in three dimensions.



3D model showing drone-derived data of 4.5 acre Cedar Creek landslide overtop of existing topographic data from the state of Oregon.

This 3D data was then compared to existing topographic data from before the landslides occurred to measure changes over time. Prior topographic data, derived from lidar surveys, is available free from the state of Oregon. Comparing these two data sets provided volumes of erosion and deposition associated with each landslide

FELLOWSHIP UPDATE



NICK WAGNER

Nick Wagner is a Native Fish Fellow, and founder of ForeSight Drone Services – a small business serving the land trust community.

He's the program manager of Salmon Watch at the non-profit World Salmon Council and an ardent bird nerd.

The Cedar Creek landslide generated an estimated 32,000 cubic yards of sediment -- that's 3,200 dump trucks of material. And the Wilson River landslide delivered an estimated 2,100 dump trucks of material directly to the West Fork of the North Fork of the Wilson River channel. These results have been compiled into a formal report that is contributing to real changes.

In collaboration with the Center for Biological Diversity, NFS is working to hold our state agencies accountable for the policies and regulations that continue to allow industrial forest practices to degrade wild fish habitat on our public lands. The findings of these drone surveys have been submitted as evidence in the ongoing litigation against the Oregon Department of Forestry, showing the impacts that logging and road-building on steep slopes have on ESA-listed coast Coho.

Today, drones are being applied broadly to science, conservation, and restoration across the world. According to a 2017 publication in *Ecological Informatics* journal, between 2013 and 2016 over 4,000 journal articles focused on drones and conservation were published – a doubling over the prior 3 years. The ability to survey an area on-demand, and collect imagery at much higher resolutions than satellites, has opened up new possibilities for scientific metrics, monitoring, and advocacy.

Like Sam, who was made more capable by harnessing Frightful's special abilities, we have a new advantage. We can apply drone technology to see the world, to see our side of the mountain in new ways. We can gain new insights and fly onwards towards abundant native fish. 🐟

Special thanks to Josh Roering (Oregon State University), Marwan Hassan (University of British Columbia), Noah Greenwald (Center for Biological Diversity), and Conrad Gowell (formerly of NFS).

PUGET SOUND STEELHEAD & THE QUICKSILVER REPORT

Puget Sound & the Quicksilver Report

Stillaguamish, Sauk, Elwha, Duckabush, Skagit, Skokomish. Those of us who have had the privilege to spend spare hours in the runs, riffles, and pools of the Puget Sound's rivers might argue that when Roderick Haig-Brown called rivers "water in its loveliest form," he should have reserved that description for the rivers of Puget Sound. Rivers as diverse and dynamic as the steelhead that swim them.

Make no mistake, Puget Sound Steelhead are struggling. Runs range from functionally extinct to reasonably healthy—they were listed as Threatened under the Federal Endangered Species Act in 2007. The future is also uncertain; degraded habitat, sprawling development, and climate change won't make recovery any more assured.

In 2017, WDFW took a new approach and started a three-year process with the Puget Sound Steelhead Advisory Group to develop a vision for the future of Washington's state fish, and steelheaders, in Puget Sound rivers. Last May, Washington State Department of Fish and

Wildlife (WDFW) published the *QuickSilver Report*, a portfolio of recommendations for future Puget Sound Steelhead conservation and fisheries management.

Breaking with tradition, WDFW gave the advisory group of steelheaders the reins to develop their own strategies and recommendations. The group was as ideologically diverse as any group of steelhead fishers could be. Derek Day, a River Steward for south Puget Sound Tributaries, was a member. For three years, WDFW dedicated nearly half of each meeting to educating the advisors on multiple aspects of Puget Sound Steelhead biology, ecology, and management in order to have a shared understanding of the issues and alternatives.

The *QuickSilver Report* advocates for creating watershed scale experiments with different fishing opportunities based on the unique conditions in each basin. The goal is to try and test strategies against fishery and conservation objectives—recovery and fishing opportunity, respectively. Once tested, fisheries

WORDS

Bradley Bobbit &
Derek Day,
River Stewards

ABOVE

Puget Sound's "S" rivers are certainly, "water in its loveliest form."

Photo: Dave McCoy



ABOVE

It's important to use our passion for these fish and continue to show up and encourage WDFW in the direction of abundant self-sustaining runs in Puget Sound.

Photo: Dave McCoy

or hatchery programs that aren't achieving their conservation goals or providing benefits for anglers would be adjusted or abandoned.

The portfolio was a compromise, and no one left fully happy. There are definitely "wins" for wild fish, such as the no hatchery and a wild catch-and-release fishery on the Skagit River, a significant stronghold of wild Steelhead in Puget Sound. The willingness of WDFW to think outside the paradigm of simply closing rivers, or producing more hatchery fish is an important win in its own right. We should also acknowledge the immense effort WDFW made to run an inclusive process with balanced view points and to introduce the advisory team to cutting edge science. This is an important step in the right direction.

There are other aspects that can't, on their own, be considered a "win." In several rivers, the QuickSilver Report proposes fisheries on

threatened fish, increased hatchery production and new hatcheries. Wild Fish Conservancy wrote a "minority report" raising legitimate concerns about the risks to Steelhead populations and WDFW's perennial challenge with implementing the monitoring and conservation actions. We share these concerns and it's our job as the Native Fish Society community to keep showing up and encouraging the Department in the direction of abundant self-sustaining runs of steelhead.

It is hard to imagine a river without Steelhead as "water in its loveliest form." The portfolio imagines a future for Puget Sound's rivers with steelhead and steelhead fishing. And future steelheaders are optimistic enough to imagine, stubborn enough to advocate for, and tenacious enough to create that future. 🐟

WILD STEELHEAD RELEASE

Developing a Sustainable Fisheries Plan for the Oregon South Coast

Since 2017, fishing guide Harvey Young, local River Stewards, and other grassroots advocates have advocated for the sustainable management of wild steelhead in Southern Oregon - the only place in the lower 48 United States where harvest of wild Steelhead occurs in nearly every stream.

Beginning in early 2020, stakeholders from the Rogue Valley and Oregon South Coast basins gathered together to lay the framework for an Oregon Department of Fish and Wildlife (ODFW) conservation and fisheries management plan to guide the direction of management for the next 12 years. Meetings transitioned to an online platform soon after the onset of COVID-19 in March. Native Fish Society's long time River Steward and outstanding advocate, Charles Gehr, represented NFS in the Rogue Basin while Mark Sherwood, Executive Director, represented NFS on the South Coast advocating for his homewaters.

ODFW staff worked to gain consensus on fish management topics including: hatcheries, fisheries, enforcement, predation, public outreach, and education. Seven meetings with stakeholders including a habitat workgroup were hosted over the past nine months. Unfortunately, data presented on Winter Steelhead populations

showed declining numbers of juvenile fish, low confidence intervals, and high uncertainty on specific population health. All meetings on hatchery and harvest actions lacked the rigorous integration of climate change science, a component NFS and other conservation advocates requested throughout.

This winter we anticipate seeing the first draft of the Rogue South Coast Plan, with additional comment opportunities for the public in 2021. We will need your support to advocate for the management strategies and actions that best promote our wild native fish. This includes no wild steelhead harvest without annual adult monitoring - "if you don't know, let them go!" Lastly, ODFW must consider and take a precautionary approach in management of climate change effects on all species in this cherished ecosystem.

It's been a year since we approached the ODFW Commission asking for the release of Wild Steelhead, and the fight is not over. We must stick together as a community to ensure that ODFW implements these critical monitoring and fisheries management actions in the Rogue and South Coast basins. We must act now to protect these wild fish, the free-flowing streams, and the communities that depend on them throughout southern Oregon. 

WORDS

Charles Gehr,
Rogue River Steward
& Kirk Blaine,
Southern Oregon
Regional Coordinator

ABOVE

The winter water cycle underway on the Chetco River.

Photo: Marcus Mattioli

FREEING THE NORTH UMPQUA

Ending the Harm from Winchester Dam

WORDS

Jim McCarthy,
Southern Oregon
Program Director,
WaterWatch

ABOVE

Winchester Dam
on the North
Umpqua River

Photo: Jim McCarthy

A coalition of over twenty fishing, conservation, and whitewater boating groups – gathered together with invaluable grassroots organizing support from Native Fish Society – has been working since 2018 to stop Winchester Dam’s ongoing harm to the North Umpqua River’s Salmon and Steelhead. It has been an incredibly challenging year for the North Umpqua, but despite these challenges, our community continues to make progress toward ending Winchester Dam’s needless harm to our native fish runs.

Thanks in part to our coalition’s advocacy, in January the Oregon Department of Environmental Quality levied a \$58,378 fine for the pollution spill and fish kill during the infamous autumn 2018 repair at Winchester Dam. The violator – a longtime member of the dam owners’ governing board and their primary contractor for dam repairs since 1991 – has since appealed, setting the stage for a contested case with an administrative law judge. This fall, coalition members NFS, WaterWatch, Oregon Wild, Steamboaters, and Umpqua Watersheds successfully intervened in this proceeding to represent the North Umpqua’s interests, and

prevent the politically well-connected violator from escaping accountability. We could do this thanks to able representation by Crag Law Center. This contested process is expected to extend into 2021, and its outcome will likely help determine the level of fish-and-water-quality-protective permitting state and federal agencies will require for future repairs at this obsolete and deteriorating structure.

In April, our coalition wrote to the Winchester Dam owners offering to raise the funds necessary to implement a WaterWatch of Oregon-proposed voluntary agreement to remove the decaying dam at little to no direct cost to the owners. Unfortunately, our offer was rebuffed. Previously, the owners rejected our 2019 offer to contribute \$8,000 in engineering services to improve fish ladder function.

This November, Steamboaters, WaterWatch, and the Pacific Coast Federation of Fishermen’s Associations filed suit in federal court over the harm caused by the dam. This challenge deals specifically with the delay, injury, or killing of protected Oregon Coast Coho salmon by the dam’s outdated and poorly maintained fish



ladder, by the owners' repeated unpermitted dam repair activities, by the use of materials toxic to aquatic life in dam repairs, and by the overwhelming number of leaks through the crumbling wood, concrete, and steel structure. Earthjustice, a public interest environmental law firm, represents the groups.

In part due to our coalition's ongoing push to bring the rule of law to this dam, state safety officials recently requested the first comprehensive inspection of the dam since 1987, required repair of known safety issues, and set deadlines for the creation of a functional Emergency Action Plan to assist first responders in the case of a dam failure. The dam's current emergency plan, which is required for all designated high hazard dams such as Winchester, dates to 1987. Due to the dam owners' delays responding to officials, we now expect completion of these critical steps to improve public safety in late 2021. Our

coalition will be using this time to demand that the Oregon Department of State Lands and U.S. Army Corps of Engineers require permits for repairs at the dam to protect natural resources and the public.

Our coalition also continues to push ODFW to require that the dam owners do more to address the ongoing disrepair, false attraction, and injury to fish in the dam's fish ladder. Unfortunately, the ladder – and the large false attraction flow into it – is in the same or worse condition than it was at the beginning of the year. However, ODFW has committed more staff time to address the issue and we hope there will be positive progress to report soon. 🐟

Do you have questions or concerns regarding Winchester Dam? Please contact Jim McCarthy, WaterWatch's Southern Oregon Program Director, at 541-708-0048 or jim@waterwatch.org.

ABOVE

A bright wild steelhead from the North Umpqua River.

Photo: Arian Stevens

SHARING A WILD STORY

Help Monitor Washington's Wild Steelhead Gene Bank Rivers

WORDS & PHOTOS

J. Michelle Swope,
Washington Regional
Coordinator

RIGHT

Husum Falls on the
White Salmon River

BELOW

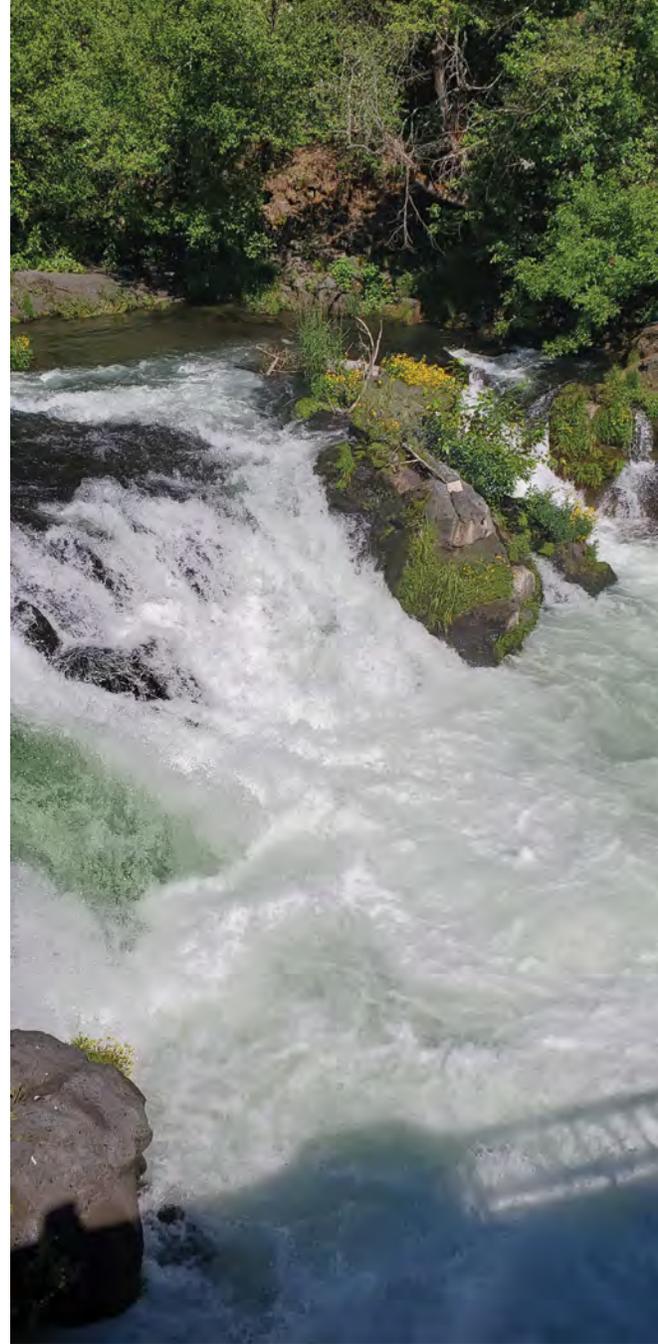
Staff members
J. Michelle Swope
and Tom Derry meet
with River Steward
and Board Chair
Paul Fortino on the
White Salmon River.

Native Fish Society is kicking off a major project with potential far reaching effects, and we invite you to become part of it. Wild Steelhead in Washington State have been given a chance, in select waters, to thrive in their natural environment, free from hatchery influence. In 14 waterways around the state, WDFW took a commendable, proactive, and transparent approach to help protect and recover these wild fish.

But the question remains: Has the gene bank designation increased the runs of wild, native Steelhead in these systems? If indeed we can show that these wild runs of native fish have not only survived but thrived in the absence of hatchery influence, this model could be applied to other struggling runs of wild fish across the Pacific Northwest.

To answer that question, we have started a process by which we will be performing redd count surveys on these select systems. To aid public understanding, we will also create an online Wild Steelhead dashboard by collecting historical and current data from WDFW and Tribal Nations, which in time, will show up-to-date counts of both summer and winter runs of wild, native Steelhead in these Gene Bank Rivers.

Our program will begin this winter, on the White Salmon River, partnering with the



Yakima Tribe and Friends of the White Salmon group. Paul Fortino, a long time NFS supporter, volunteer River Steward, and Chair of our board of directors, is heading up this effort, and we welcome other volunteers to join this project as we move forward. We will also begin Winter Steelhead redd counts on the Sol Duc river on the Olympic Peninsula in early 2021.

If you are interested in helping us gather this valuable data, please contact J. Michelle Swope, Washington Regional Coordinator (jmichelle@nativefishsociety.org) to volunteer. Together, let's tell the story of these iconic fish and their survival. Please join us as we make an investment in these fish and their future. 🐟



PACIFIC LAMPREY

The Ancient Ecological Connector

The link between aquatic and terrestrial ecosystems facilitated by anadromous fish species has been described as significant, as well as the connection between oceanic and freshwater ecosystems. These links are exemplified by the life history of an understudied fish, which has been around for approximately 400 million years and survived several mass extinction events, the anadromous Pacific lamprey. Not long ago, Pacific lamprey had separate taxonomies for the adult and the larval life stages due to a metamorphosis the larval form undergoes, which transforms Pacific lamprey appearance.

Larval lamprey are filter feeders with no teeth or eyes. Sometime between ages 2 to 7, during the summer months, larval lamprey gradually develop eyes, kidneys, and that infamous oral disc with teeth. Now considered juveniles, they emerge from the river substrate and begin swimming downstream to the estuary between the late fall and spring. Eventually they enter the ocean where Pacific lamprey feed on a variety of hosts, including fishes and whales, by latching on with their sucker-like disc and drilling into them using a bony tongue. They are a polite guest, surviving off the bodily fluids of their host and only occasionally killing it. Lamprey saliva has been found to contain proteins with anticoagulative, antioxidative, antibacterial, and analgesic properties to suppress the adverse responses generated from hosts.

After 1 to 3 years in the marine waters, Pacific lamprey navigate to their upriver spawning grounds by following a pheromone trail secreted by larval stage lamprey digestive tracts. Unlike salmon, Pacific lamprey do not necessarily return to their natal streams. This 'Suitable River Strategy' is thought to work based on the concept that if the habitat is healthy enough to support larval stage lamprey, then it is suitable habitat for spawning. Also, since adult Pacific lamprey are at the mercy of the travel plans of their host, it may not be possible for the adult to swim hundreds of miles back to their natal river once they enter into the reproductive stage.

Most Pacific lamprey die in freshwater after a return spawn migration, where nitrogen, carbon, and other substances produced from carcass decomposition are absorbed by the benthic sections of streams and adjacent riparian areas. This process contributes essential marine-derived micro-nutrients and organic matter to the food web of low nutrient streams and terrestrial areas. Nutrient input results in increased plant growth, which increases herbivore food supply and macroinvertebrate and terrestrial insect habitat, resulting in a larger insect population. The increased insect biomass results in improved stream productivity by providing higher food availability for juvenile salmon and other fish. Lamprey biomass is also a key in-stream food source for salmon fry, sturgeon, and filter feeding

WORDS

Keith Parker,
Fisheries Biologist
Yurok Tribe

ABOVE

Pacific lamprey holding together against the current.
Photo: David Herasimtschuk,
Freshwaters Illustrated



ABOVE

Beach harvest of Pacific lamprey near the mouth of the Klamath River
Photo: Keith Parker

ammocoetes as well as bear, mink, fishers, river otter, blue heron, eagles, osprey, kingfishers, and many other creatures.

The Klamath River Basin (KRB) of remote Northern California and Southern Oregon supports the highest diversity of lamprey species of any single watershed in the World, with Pacific lamprey suggested to have been the KRB's most abundant fish species historically. So many Pacific lamprey in fact that Native Tribes of the KRB recount traditional stories of Pacific lamprey returning for spawning migration in such mass that indigenous people would avoid the river for days due to a brown film and strong odor which formed on the water surface post spawn and death. However, since the mid-1800s, KRB resources have been exploited through overfishing, commercial logging, gold mining, water diversions, and dams without fish passage. Dams, in particular, have had a catastrophic impact as multiple dams have cut off hundreds of miles of former spawning and rearing habitat for Pacific lamprey.

Currently, Pacific lamprey harvest in the KRB

has reduced by several orders of magnitude since the 1960s due to massive declines in abundance, impacting KRB Tribes with adverse health, social, and spiritual effects. Language, religion, ceremony, traditional food sources, and other cultural practices are intertwined and evolve synchronously in a society, not independently; remove any one societal feature and the other features are all negatively impacted. For example, correlations between the reduction or loss of Omega 3 fatty acid rich fish consumption and near epidemic increases in the cases of obesity, diabetes, mental health disease, and other health issues have been observed in Native American communities. "At the core of Tribal sovereignty is food sovereignty. Food is a foundational part of Tribal cultures which feed much more than our physical bodies – traditional foods feed our Spirits. This is because foods represent our living link with our land." -Valerie Segrest, Muckleshoot Tribe

The cultural and subsistence importance of Pacific lamprey, or "Eels" as Tribal people call them, cannot be overstated. Eels provide Tribal people with high lipid food during the cold winter months when the salmon are not running and sustain marine mammal populations, which Yurok Tribal members also harvested and consumed historically. Eels have significantly higher lipid content—the highest Omega 3 fatty acid content of any seafood at 1,300 mg/100 gm mass, providing higher caloric value per unit body weight (6 kcal/g wet mass) than salmon (1.3 to 2.9 kcal/g wet mass). For the remote Tribal river and fish people of the KRB, the rivers have acted as their grocery stores, supplying fish packed with marine derived nutrients since time immemorial.

While Pacific lamprey are a Tribal trust fish species protected under treaty and other rights, they do not have a recreational or commercial value. This is the reason there is little funding to perform research and why it is one of the least studied fish in the Pacific Northwest. However, I was able to secure funding from

the National Science Foundation and the Robert and Patricia Switzer Foundation to investigate the association of genetic variation with ecotypic differentiation in Pacific lamprey as they initiated their anadromous migration. The objective of this study was to combine next-generation genetic sequencing with traditional ecological knowledge to evaluate imperiled Pacific lamprey and apply the findings to conservation in the context of resolving Native American traditional food security issues.

We intercepted 219 individuals over 12 months in the Klamath River utilizing Native American traditional knowledge of harvest technique (handmade eel hook), run-timing, and locations. Each individual was genotyped at 308 neutral and adaptive single nucleotide polymorphism gene locations at the CRITFC lab in Hagerman, ID through a collaborative agreement. Morphological traits were also recorded, including egg mass as an indicator of female sexual maturity.

The onset for freshwater migration for an ocean-maturing ecotype (mature eggs) identified was predominantly the winter; Whereas a river-maturing ecotype (immature eggs) entered during all seasons and a genetic basis of the ecotype diversity was discovered. Genotype-phenotype association mapping identified sixteen gene locations significantly associated to egg mass forming two groups of linked genes and ten other genes significantly associated to total length. Substantial egg mass variation is observed in female Steelhead (winter-run versus summer-run) and salmonids (spring-run versus fall-run chinook); both species exhibiting substantial temporal differences in egg mass segregated by seasonal run times. Remarkably, these life history variations were not observed in Pacific lamprey with the river- and ocean-maturing ecotypes, analogous to spring- and fall-run salmon respectively, having concurrent migration with collection of both ecotypes with distinguishing large and small egg masses occurring at the same time.



An inheritance model was developed which best supported the ocean- and river-maturing ecotypes, accurately predicting ecotype in 83% of the samples. The adaptive genetic variation revealed is useful for conservation planning as it indicates that the river-maturing ecotype carries standing genetic variation capable of producing both ecotypes, while the ocean-maturing ecotype is almost exclusively homozygous. Therefore, when assessing stream restoration projects, the river-maturing ecotypes could perhaps be prioritized as they contain the genetic diversity capable of producing both ecotypes (i.e., heterozygosity), whereas the ocean-maturing ecotypes do not.

In recognition of the importance of Pacific lamprey as a native fish to Pacific Northwest fishing tribes, we adopted the names ke'ween (lamprey "eel") and tewol (ocean) for the river-maturing and ocean-maturing ecotypes respectively, using terms from the Yurok language. 

Special thanks to Andrew Kinziger, PhD for his edits.

ABOVE
Pacific lamprey
from the Klamath
River
Photo: Keith Parker



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