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STRONG RUNS

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STRONG RUNS

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Native Fish Society is a tax-exempt, non-profit charitable organization.

"A society grows great when old men plant trees whose shade they know they shall never sit in." –GREEK PROVERB

COVER
Chinook gyotaku
Print: Duncan Berry

ABOVE
Photo: Dave Carpenter,
North Santiam River Steward

HOMEWATERS: CONVERGE

WORDS
Mark Sherwood,
Executive Director

ABOVE
A yearly tradition: Chinook salmon preparing to spawn.

Photo: Dave Thomas,
McKenzie River Steward

Below the confluence of a tiny creek and the Chetco River, there is a long gravel bed adjacent to a fern-covered bank. Every December for the last four years, I make a pilgrimage to this spot to spy on spawning Chinook. The scene will never lose its magic. Confined to the clear, shallow water, their spotted backs break the surface as males joust and females dig redds.

Over generations, spawning salmon have not only perpetuated their own species, but also shaped the surrounding landscape. They enrich the soil, boost streamside biodiversity, and, according to a recently published study by Alex Reimer of Washington State University, they shape geology as well. Provocatively titled "Sex That Moves Mountains," Reimer's paper shows that over many generations female salmon will alter entire landscapes. Streams with salmon erode faster than those without them. Streams with big salmon, like Chinook, erode rapidly and exhibit the steepest banks of all.

A thousand generations of Chinook may have spawned at this bend in the Chetco River. Did the ancestors of the fish in front of me shape this riverbend, construct this gravel bed, and

furnish the nutrients necessary for the ferns and the trees overhead? In the same way these native fish shape their homewaters, our River Stewards, staff and partners converge into something greater. Together, they shape the future of native fish recovery across the Pacific Northwest in a way that individual conservation efforts can't.

Native fish are strongest where their homewaters converge. In 2018, Native Fish Society is strategically following suit by increasing convergence in our work. We will host more trainings for our nearly 90 River Stewards. We are adding two River Steward Gatherings, in the spring on Whidbey Island in Washington, and in the summer on the Scott River in northern California. At gatherings, River Stewards from around the region can share successful advocacy skills, discuss the latest research on native fish, and inspire one another. This year, we'll even cross the border. For the first time, NFS will bring together advocates from both British Columbia and the American Northwest.

The challenges and opportunities shared at River Steward gatherings have evolved into some of our most significant victories for native fish. These include one million fewer hatchery fish every year in Oregon and Washington rivers, 2,200 square miles of Washington watersheds set aside for wild steelhead, and 22,000 miles of Oregon's salmon and steelhead habitat permanently protected from suction dredge mining. When River Stewards converge, they make an impact.

This year, Native Fish Society is embarking on Diversity, Equity and Inclusiveness work with help from the Meyer Memorial Trust, the Confederated Tribes of the Siletz Indians, and the Center for Diversity and the Environment. Through a training session and the creation of a strategic plan for inclusiveness, we hope to increase our organization's ability to welcome native fish advocates from all communities and walks of life. Our organization's vision for the future - a future with abundant native fish in watersheds across the Northwest - is shared by many communities. It's time that native fish fully benefit from that shared vision. It's time time for new alignments and unexpected strategic partnerships.

We believe this work is vital to our mission. Research confirms that diverse teams perform better and make better decisions. With the perilous state of native fish and the complex web of challenges they face, we need the best possible advocates and a unified voice. Now is not the time for fracture; it's time to stand together for our shared homewaters.

Fundamentally, the River Steward Program is a platform for grassroots advocacy. Native Fish Society exists to provide stewards with the tools they need to make the biggest impact. To that end, we're creating three new positions: two full-time regional staff positions, in both the Columbia River Basin and the state of Washington, and a third position position that will keep River Stewards up to date on the latest scientific advances, so that our grassroots advocacy and the solutions we advance are always grounded in the best-available science.

I'm proud of the strides we are about to take as an organization. Of course, none of this would be possible without our members, supporters, and donors. We're proud of and humbled by your faith in us. We want to honor that faith by maximizing the impact of every dollar. Through the convergence of our shared passion for wild, native fish, we can sustain the miracle of their return. Together, we can ensure that they continue to shape the land, enrich our lives and stir the imaginations of future advocates as they have since time immemorial.

SAVE THE DATE

April 7th

NFS Homewaters Banquet & Auction, 5 p.m. at Montgomery Park in Portland, Oregon.

Don't forget to get your tickets to the biggest party on the planet for wild, native fish!

GREB1L

A single gene shaped divergent life histories in steelhead and chinook salmon. Will its discovery shape the way we manage them?

WORDS

Conrad Gowell,
River Steward
Program Coordinator

ABOVE

The beauty of diversity: A summer steelhead from the Siletz River, one of five watersheds from which study samples were taken.

Photo: Conrad Gowell

The unraveling of native fish is more apparent with spring Chinook and summer steelhead than any other fish swimming in the Northwest. Anglers understand that these fish are not the same as their fall and winter counterparts because of the distances they travel and the habitats they seek. So do chefs and gourmets, who value the rich flavor of fattier flesh. Indigenous cultures revere this diversity, which once sustained their communities throughout the year. Commercial fishers rely on these stocks for the same reason, which provide them with fish to catch throughout the year and fetch higher prices at market.

Unfortunately, the existing management paradigm isn't protecting the diversity of anadromous fish. When you look at the big picture, spring Chinook and summer steelhead have been extirpated or are in significant decline. Fall Chinook and winter steelhead, on the other hand, are extant and doing relatively better. But the recovery and protection of native fish depends on the conservation of diverse life histories.

Despite vastly different ecological needs and niches, fishery managers have grouped subspecies, life histories, and species into conservation units. Spring Chinook are considered separately from fall Chinook, existing in their own Evolutionary Significant Unit, or ESU. Winter and summer steelhead, however, are lumped together into a single Dependent Population Segment, or DPS. Spring Chinook, where they live in relatively small, sensitive populations, and summer steelhead life histories don't receive special conservation protections because they are thought to be closely related to fall and spring run fish.

Until recently, research tacitly supported this paradigm by suggesting that spring and summer life histories arose in multiple populations across their range and could be re-evolved if they were lost. New genetic research coming out of the University of California-Davis shows something different. Contrasting the previous paradigm, the research shows that summer steelhead and spring Chinook evolved separately, many times, in many watersheds.

In both species, the early-migration life history is caused by a mutation in a single gene, GREB1L. Samples for steelhead were taken from five watersheds in Oregon and California, including summer steelhead from the Umpqua, Eel, and Siletz rivers, and winter steelhead from the New and Scott rivers. Using newly developed genetic sequencing tools, the researchers analyzed more than 600,000 points in the steelhead genome.

The research findings present evidence that the mutation to GREB1L that gave rise to spring Chinook and summer steelhead evolved once in the past 15 million years. If lost, it would be unlikely to occur again.

GRASSROOTS GROWTH

NEW RIVER STEWARD INTRODUCTION: ANDREW CHIONE, YAMHILL RIVER

WORDS

Andrew Chione,
Yamhill River Steward

Born and raised in Illinois, Andrew now lives in Newberg, Oregon. He is studying Fisheries and Wildlife Science at Oregon State University. In his spare time, he explores Oregon's Cascade and Coast Range creeks with a mask and snorkel. Follow him on Instagram @coldwater_lifestyle.

ABOVE

Upper Mill Creek, a South Yamhill River tributary.

Photo: Andrew Chione

UPPER RIGHT

Steelhead spawning habitat in the Yamhill River headwaters stream.

Photo: Andrew Chione

LOWER RIGHT

A Yamhill River coastal cutthroat trout.

Photo: Andrew Chione

The Yamhill River winds from the Oregon Coast Range to its confluence with the Willamette River. The river passes vineyards, hazelnut orchards, and pastures and runs through the cities of Grande Ronde, Willamina, Sheridan, and McMinnville. From Highway 18, on their way to the coast, most people see the muddy, slow-flowing side of the Yamhill, where the river is flanked by gnarled oaks and surrounded by a pastoral patchwork of farmland. Oregon's salmon and steelhead rivers often conjure images of temperate rainforests, desert canyons and snow-capped peaks. What could be special about the lazy Yamhill River valley?

Besides the farmers who irrigate their crops with the Yamhill and the small towns who get their drinking water from it, the river also supports runs of coho salmon, winter steelhead and a robust population of coastal cutthroat trout. Coho are not native to the watershed. They were planted there by Oregon Department of Fish and Wildlife starting in the 1960s. The state discontinued the program in the 1980s, but a run still returns every year.

Winter steelhead, on the other hand, are native to the Yamhill. ODFW introduced hatchery steelhead from the 1960s to the 1980s. Just a few steelhead return each winter, but they are still there. The Yamhill River steelhead, along with other wild steelhead in the Willamette system are protected by the Endangered Species Act. It's illegal to fish for them, but spotting these rare fish leaping a waterfall or digging a redd is always a thrill.

The watershed also supports native suckers, northern pikeminnow, redside shiners, and dace. Local anglers are especially fond of the Yamhill's coastal cutthroat trout. You can find these feisty fish in most streams in western Oregon. They strike ferociously and leap wildly when hooked. My first Oregon trout was a Yamhill cutthroat, as was my second, third and maybe a few more.

Coastal cutthroat trout are listed as a species of concern at both the state and federal levels. Like most native species, they are sensitive to pollution and habitat degradation. As the most abundant salmonid in the Yamhill, they are used as an indicator species to assess habitat quality and determine locations for future restoration projects. The current ODFW regulations allow anglers to harvest two wild trout per day from May 22 to October 31. Few things in life are more satisfying than eating fresh trout by a river, but I rarely keep them. I have seen a lot of the watershed through a mask and snorkel; keepers aren't as abundant as I would like to think.

Every spring for the last few years ODFW stocks the Yamhill River with 2000 hatchery rainbow trout. With a healthy population of wild cutthroat, the stocking seems superfluous at best. I'm especially concerned about the effects of competition between unnaturally aggressive hatchery fish and juvenile steelhead that rear in the Yamhill. ODFW does its best to stock after the typical juvenile steelhead begins its downstream migration, but every year I see them in lower Willamina Creek after the stocking date. And every year, anglers I know catch hatchery rainbows out of the same stretches of river as juvenile steelhead. I don't target the hatchery rainbows because there is already good cutthroat fishing. Why would I fish for hatchery trout, when there are wild cutthroat around? Most of the anglers I know who fish the Yamhill feel the same way.

If ODFW stopped stocking the Yamhill, there would still be plenty of opportunity for anglers in the area. In Sheridan, the local pond is stocked with thousands of trout each year. Sheridan Pond is easy to access, comfortable for families, and the town hosts an annual fishing derby. ODFW should be applauded for this program. Not only does it offer a chance to catch and keep a few trout without having to trespass or bushwhack through blackberry and poison oak, it also reduces the risk of hatchery trout competing with wild cutthroat and juvenile steelhead. If wild trout don't need to compete with hatchery trout, we can have the best of both worlds.

NEW RIVER STEWARDS

Andrew Chione, Yamhill River

Peter Donahower, Fifteenmile Creek

Chris Johnson, Nooksack River

Terre Rogers, Molalla River

Jason Small, Tributaries of South Puget Sound

David Thomas, McKenzie River

Oregon Department of Fish and Wildlife has agreed to host a town hall meeting this spring in Yamhill County to discuss the future of the Yamhill River stocking program. We will need you to speak up for endangered Willamette steelhead and native cutthroat by telling ODFW to stop stocking the Yamhill River with hatchery trout. Please keep an eye out for details at nativefishsociety.org.

CAMPAIGN KICKOFF

ON THE BRINK

Coalition takes the Army Corps to court over the future of the Willamette's anadromous fish

WORDS

Jeremy Lees,
Tualatin River Steward

ABOVE

Photo: Dave Carpenter

To stay up to date on the fate of the Willamette's anadromous fish, please visit nativefishsociety.org. In 2018, we will need you to weigh in on NMFS's Upper Willamette Hatchery Genetic Management and Downstream Fish Passage plans. Public oversight on the management of hatchery programs and fish passage is crucial to the recovery of threatened spring Chinook and winter steelhead in the upper Willamette.

The Willamette Valley is the most populous watershed in the state, home to about 70 percent of Oregonians. Historically, it was also home to hundreds of thousands of anadromous fish that ascended Willamette Falls each year. But as a result of industrial, urban, and agricultural development, as well as poor fishery management, native fish populations in the Willamette basin have declined steadily as the human population has grown.

While the bulk of spring Chinook and winter steelhead were lost over a century ago, the Army Corps of Engineers delivered a punishing blow in the middle of the 20th century by building 13 dams throughout the Willamette basin. At a time when anadromous fish desperately needed relief from decades of pollution, habitat destruction, and hatchery influence, the dams cut these fish off from most of the quality spawning and rearing habitat that was left. To make up for it, the Army Corps put five hatcheries into production that temporarily satiated sport anglers, but further degraded the genetic integrity of the wild fish. By 2005, the dead-end strategy advanced by the Army Corps of Engineers and the Oregon Department of Fish and Wildlife had driven Willamette spring Chinook onto the growing list of salmonids protected by the Endangered Species Act. Willamette winter steelhead joined them the very next year. As 2017 comes to a close, the effect of a decade of protections under the Endangered Species Act is functionally nil; both spring Chinook and winter steelhead are on the brink of extinction.

Following the Endangered Species Act listings, the National Marine Fisheries Service drafted a formal Biological Opinion that proposed a series of actions and deadlines. But in the nine years since the National Marine Fisheries Service issued the BiOp, the Army Corps has failed to implement many of the most important measures. Officials claim the Army Corps spent $194 million to improve habitat and fish passage on the North Santiam, South Santiam, McKenzie and Middle Fork Willamette rivers. But most of that money has gone toward non-volitional fish passage, like trapping and trucking adult fish around dams, which fails to address the root of the problem.

A decade of steady decline, coupled with the stresses of climate change, suggest that if the status quo is not disrupted the downward trend will continue. State officials have, in part, blamed sea lions and cormorants for the dwindling returns. Though predation does have an impact, the root problem is a century of mismanagement. In 2017, Willamette winter steelhead returns were the lowest in recorded history, suddenly in a position for predators to have an outsized effect on their survival. Still, the department refuses to take responsibility for the burden its hatchery programs place on native fish. This year, the Oregon Department of Fish and Wildlife sounded the alarm when sea lions took an estimated 20 percent of the winter steelhead run, going so far as to suggest that sea lions could drive Willamette winter steelhead extinct. But in sub-basins like the North Santiam, there is a 27 percent decrease in wild spawning production that can be blamed on the state's hatchery summer steelhead program.

Throughout the Willamette basin, the Oregon Department of Fish and Wildlife has operated hatcheries for years without approved Hatchery Genetic Management plans. The genetic introgression between hatchery spring Chinook and their wild counterparts consistently exceeds the limit prescribed for basins with stronghold populations. Though the Oregon Department of Fish and Wildlife acknowledges the negative effects, the department continues to put its hatchery programs ahead of the needs of wild fish.

With extinction looming over two iconic runs of fish, the negligence of our governmental agencies has prompted several groups to take action. Most recently, Native Fish Society and our River Stewards in the upper Willamette, Northwest Environmental Defense Center, and WildEarth Guardians - represented by Advocates for the West - are challenging the Army Corps in court for violating the Endangered Species Act. The goals of the suit are a sincere reevaluation of dysfunctional management practices and, ultimately, the adoption of a new plan for the Willamette that prioritizes wild, native fish.

In the short term, the Army Corps can help native fish by increasing their investments in fish habitat and monitoring, improving water quality below their dams, as well as requiring the hatchery programs they fund be permitted through the National Marine Fisheries Service and operated according to the best-available science. Ultimately, trap and haul programs must give way to volitional fish passage. NMFS's BiOp, which is now almost a decade old, should be revised to provide an updated blueprint for progress. This legal challenge is about accountability. With the proper protections and the right investments, we can bring Willamette winter steelhead and spring Chinook back from the brink.

CAMPAIGN KICKOFF

LANDSLIDES, GOOD AND BAD

Let's stop clearcut logging on steep slopes in private Oregon forests

WORDS

Doug DeRoy,
NFS North Coast
District Coordinator

ABOVE

Not all landslides are created equal.

Photo: Conrad Gowell

Since the 1994 adoption of the Northwest Forest Plan, which regulates logging on federal land in Oregon, commercial logging in Oregon's federal forests has fallen by roughly 90 percent. Over that same time, private land has been logged at roughly the same rate as it was 24 years ago. In fact, approximately 75 percent of all logging in Oregon now occurs on private forestland.

With a bird's-eye view of an Oregon Coast Range forest, it's easy see that logging dominates the landscape. Our "Landslides to Logjams" campaign aims to shed light on the state's failure to regulate clearcut logging on steep, unstable slopes adjacent to rivers - a practice that has become all too common.

Unlike landslides that occur on forested slopes, which carry trees and other large woody debris into the river, landslides on clearcut slopes occur more frequently and with greater magnitude. In fact, studies show that landslides occur up to 24 times more frequently after an area has been logged. They dump massive amounts of sediment and, not surprisingly, little to no large wood into rivers. Moreover, the sediment dumped into streams by a clearcut landslide is more likely to impair water quality.

The native salmon, steelhead, and trout of Oregon's North Coast depend on deposits of large woody debris to create and maintain logjams in their natal streams. Logjams protect juvenile fish from predators, offer shade during the summer when water temperatures spike, and create critical spawning habitat by trapping gravel. Clearcut landslides destroy spawning habitat by smothering spawning gravel with fine sediment. Sedimentation also reduces the available rearing space for juvenile salmonids by burying cobble and filling rearing pools. When sediment fills pools and creates broad, shallow channels, it deprives salmonids of vital overwintering habitat, disrupts feeding and rearing, and exacerbates stream temperature problems.

With the help of local and regional stakeholders, Native Fish Society is working to put an end to clearcutting on unstable slopes.

> ***We need your help! If you see a landslide and below a steep slope clearcut, please take photos and send them to North Coast District Coordinator Doug DeRoy. You can send them by email at dougderoy@gmail.com, or post them on Instagram or Facebook along with the hashtag #LandslidesToLogjams.***

CAMPAIGN UPDATE

TO REMOVE A CULVERT

A rusted culvert stands between anadromous fish and miles of pristine habitat. *The North Creek Campaign aims to change that.*

WORDS

Matt Lund,
Siletz River Steward

ABOVE

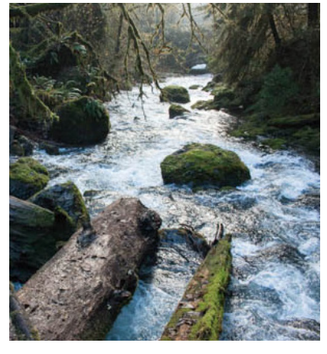
Matt Lund examines the culprit—a rusty culvert that stands between anadromous fish and 16 miles of pristine spawning and rearing habitat in the Siletz River basin.

Photos: Conrad Gowell

River Stewards from the Native Fish Society are working alongside a coalition of nonprofits to remove a rusted culvert that blocks anadromous fish passage to North Creek in the Siletz River basin. By removing a single culvert, we can give wild anadromous fish access to 16 miles of quality habitat in a hatchery-free stream surrounded by old growth forest.

In 2016, 45 people signed a letter of support, which we presented to the United States Forest Service. The letter pointed out the problem and asked what we could do to solve it. The result was a new coalition of nonprofits, including the Siuslaw National Forest, Midcoast Watershed Council, Salmon-Drift Watershed Council, Trout Unlimited, Siletz Tribe, Drift Creek Camp and the Native Fish Society. As a group, we are working to secure the necessary grants, permits, engineering, and funding. So far, we have finished geotechnical surveys, drawn up restoration designs, and raised 28 percent of the project's total cost.

With the hope of crowd-sourcing some of our funding, we also opened a Kickstarter page. This has not only helped us raise an additional $4,834 so far, but also broadened the scope of public support. The North Creek Campaign would not be where it is today without your support and dedication to wild, native fish. Thank you!



> ***If you would like to help us reach our $10,000 goal, please visit the North Creek Campaign page at nativefishsociety.org.***

AN OPPORTUNITY ON THE EEL

The federal license for Scott Dam expires in 2022

WORDS

Jake Crawford,
Southern Regional
Manager

ABOVE

Above Scott Dam, NFS River Stewards have identified hundreds of miles of excellent coldwater habitat for anadromous fish.

Photo: Rich Zellman

Built in 1922 without fish passage, Scott Dam blocks wild salmon and steelhead from hundreds of miles of quality habitat in the headwaters of California's Eel River. Part of a three-part hydroelectric and water-diversion facility known collectively as the Potter Valley Project, the federal license for Scott Dam will expire in 2022. With your help, wild salmon and steelhead could once again access this important cold water habitat.

Starting this year, stakeholders are able to submit information to help guide the relicensing of the Potter Valley Project. The Federal Energy Regulatory Commission will take into consideration any damage to the Eel's native fish. This is a critical opportunity. In just four years, we could be planning the removal of the most significant physical obstacle to the recovery of threatened Eel River salmon and steelhead.

At Native Fish Society, our first goal is to restore volitional passage for salmon and steelhead to the Eel River's headwaters. NFS River Stewards have identified hundreds of miles of quality, coldwater habitat above Scott Dam. Access to any quality habitat that's left within their distribution will provide wild salmon and steelhead with an important buffer against a changing climate.

Second, federal and state agencies must evaluate and account for the projected impacts of climate change. Licenses are typically renewed for 30 to 50 years. Downstream water-quality issues resulting from maintaining the project must be taken into consideration.

Lake Pillsbury, the reservoir formed behind Scott Dam, has been filling up with sediment for nearly a century. As it continues to fill, Pillsbury will become shallower and hotter. Climate change projections suggest higher temperatures will result in reduced flows and algae blooms, resulting in degraded water quality. Downstream, the dam is depriving the Eel of sediment, gravel, cobble and woody debris, which is essential to a healthy watershed.

In order to save the wild salmon and steelhead of the Eel River, we must restore the ecological processes necessary for the fish to adapt and survive. Dead-end strategies like trap-and-haul programs have not allowed wild fish to respond to changing environmental conditions. As the climate warms, wild salmon and steelhead will need to access the Eel's cold headwaters. This winter, a coalition of groups submitted our goals to FERC for their review. In 2018, the Eel River will need your support too. Please keep an eye on the Eel River Headwaters Campaign page at nativefishsociety.org for opportunities to add your voice asking for the removal of Scott Dam.

To learn more about our River Stewards' temperature monitoring visit the Eel River Headwaters Campaign page at nativefishsociety.org.

Native Fish Society is proud to be a charter member of the Eel River Forum. In particular, we'd like to thank our fellow members for their work on behalf of the Eel and its native fish:

- Friends of the Eel
- California Trout
- Trout Unlimited
- California Sportfishing Protection Alliance
- American Whitewater

I AM SALMON

WORDS

Duncan Berry, Salmon River Steward

my body the
the elegant result
of millions of years of trial and error
adapting to mountain ranges that have come and gone
rivers once flowing now dry
rocks made and unmade
and me
still here

I am salmon
and my body is a simple miracle
red of gill
iridescent of scale
muscled for bursts and glides
small white ear bone in my head bearing
witness to it all
annular rings written
in calcium and mineral molecules
the origins of my mother and father
what river birthed me
what I ate
and when
and where
and this is only one page
in the book that I am

and you two legged ones
coming late to this party
scarce 200 years now
but bearing chain saws and damns
and sharpened hooks and strong nets
you who we call the salmon eaters

but who amongst you could survive
being dropped from your mothers belly
onto clean black rock
into cold rush of oxygen rich waters
emerging with only an egg sack at your belly
for a jumpstart
and nothing more

tumbling down tributaries
into estuaries
where the tang of salt burns your gills
spit out the mouth of the river
into the great liquid canyons of the continental shelf
with its legions of oil rich eulachon sand lance anchovy
and herring

who amongst you

could return from a great arc to the north
looping back
years later
in a navigational miracle
to the taste
of the river
of your birth
feeling your flesh pulled from your bones
no food in your belly
single-minded purpose
of passing the genetic baton
in the perfect
tiny red spheres
like the circle completed once more

who amongst you?

and in the midst of this
mighty race run
we give you humans our all
gifting your race with our bodies
from time immemorial

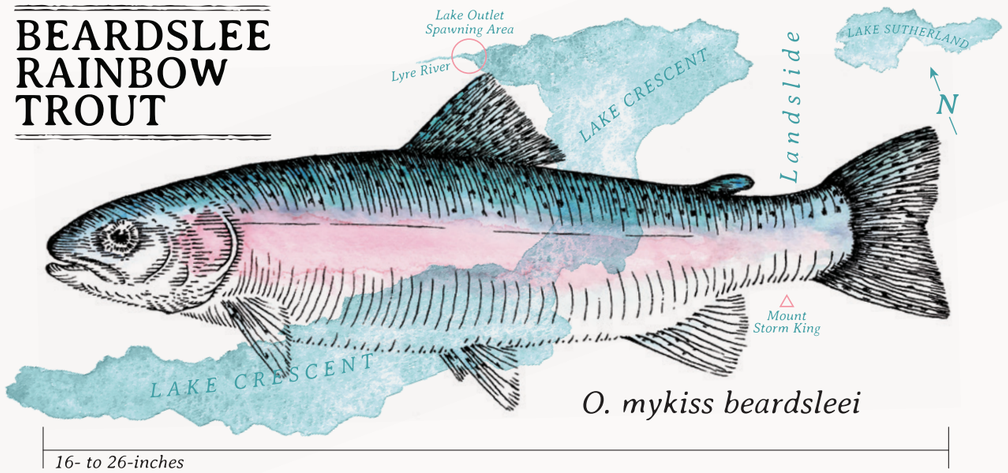
and all we ask in return
is that when you take our brilliant flesh
into your bodies
raising us to your lips
that you pause
and remember that
what you are consuming is this optimism
and persistence and selflessness
of ours
we salmon becoming human

and all we ask in return
is to honor our gift
by making the work you do in the world
extraordinary
burning us as rich bright fuel
so that the work you do in the world
will be
extraordinary.

I am salmon

Using the traditional Japanese method gyotaku, Salmon River Steward Duncan Berry takes a print of a Oregon Coast Chinook.

Photo: Frank Boyden



BEARDSLEE TROUT

Reflections of place

WORDS
Brett Tallman

ART
Ed Hepp

Seven thousand years ago, Lake Crescent was shaped like a lightning bolt. It drained east from its outlet at Indian Creek to the Elwha River and into the Strait of Juan de Fuca. The geologic past of the big lake would be easy to imagine for a raven flying off of Mount Storm King; at its east end, Crescent's northern and southern shorelines are keyed to the same horizontal projections as a smaller lake, Sutherland, a mile away. As Highway 101 approaches Lake Crescent, the road grade climbs the remnants of a mountainside, which, seven thousand years ago, was deposited in the middle of the lake by an earthquake so powerful that, if it hit tomorrow, *The New Yorker* would dub it 'The Really Big One.'

East of the landslide, Lake Sutherland still drained to the Elwha. West of it, the waterline rose 55 feet before finding a new outlet down the Lyre River, over a falls and, finally, as before, into the Strait of Juan de Fuca.

Those geologic features - the landslide and the Lyre River Falls - had a profound effect on the fish of Lake Crescent: they cut them off from the ocean. Fish that had once been steelhead, sea-run cutthroat and sockeye salmon were landlocked, forced to make a living in a lake so devoid of nutrients that biologists have deemed it 'ultra-oligotrophic.' Quantities of nitrogen, phosphorus and other biologically important nutrients are so low in Lake Crescent that, if you find yourself in a boat on a calm day, the water can be unnervingly clear. Naturally, the fish adapted. Surprisingly, they thrived.

The product of 7,000 years of isolation is the Beardslee rainbow trout, a unique population of some of the largest non-anadromous rainbows within their native range. There are records - old records, of course - of Beardslees up 23 pounds. Like most trout, the fish eat whatever aquatic and terrestrial insects can be found in an ultra-oligotrophic lake. However, as they get larger, Beardslees become piscivorous, feeding almost exclusively on the descendants of the lake's sockeye salmon, kokanee.

The next great change to Lake Crescent came at the turn of the twentieth century. At least 11 different fishing resorts operated along its shorelines. Like anywhere in the American Northwest, turn of the century harvest regulations were liberal. As stocks dwindled, they were supplemented with hatchery plantings of native and non-native salmonids. In addition to coastal cutthroat, rainbows, and kokanee, the lake was stocked with coho salmon, brook trout, lake trout, westslope cutthroat and Yellowstone cutthroat. All told, between 1913 and 1975, Crescent was stocked with 14.3 million hatchery fish. However, bucking the trend of non-native invaders, the stocked fish failed to establish self-sustaining populations. Even lake trout, which are long-lived, eat everything and are decimating native fish species throughout the west, didn't take.

While the mechanisms responsible for the resilience of native stocks in a body of water like Lake Crescent are still a mystery, at least two studies have shown that Beardslee trout are genetically distinct from other rainbows.

"There is something unique about the fish that are able to live here," Olympic National Park Biologist Sam Brenkman said. "It speaks to Lake Crescent's native fish; they are highly-adapted to this environment."

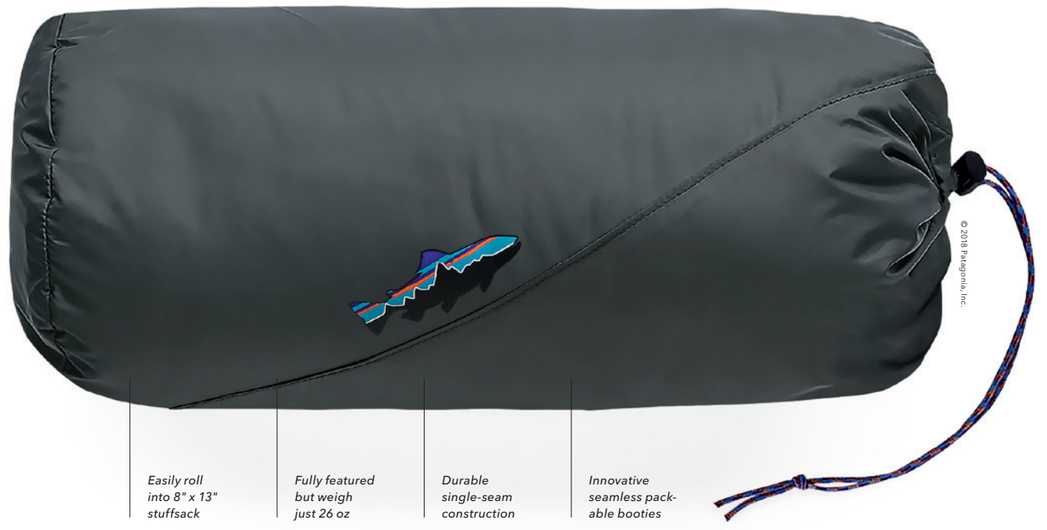
Today the lake, which falls mostly within the boundaries of Olympic National Park, is managed for the restoration and preservation of its native fish. In 2000, the Park Service changed fishing regulations to catch-and-release only and added a weight restriction to keep Beardslees in deep water from being brought up too fast. Later, at the urging of a Port Angeles resident, the late Dick Goin, they also moved opening day from April to June to protect spawning fish.

By now, spawning habitat is the main thing that keeps Crescent's fish managers up at night. The Beardslee's spawning area is confined to the lake outlet above the Lyre River Bridge. It's unique habit for a rainbow trout. Unlike steelhead, which spawn in moving water all over the Olympic Peninsula, Beardslees only spawn in the lake outlet. Why? There was nowhere else to go. Most of the streams feeding the lake are steep, intermittent and offer little to no spawning and rearing habitat.

The limited spawning area is a double-edged sword for Park Service biologists. Instead of index reaches, the Park Service takes a census of the entire spawning population of Beardslee trout. That data goes back to 1989, the longest-term data set on the Olympic Peninsula. The trade off is that all the eggs - both literal and proverbial - are in one basket.

Of course, everything I've said specifically about Beardslee trout is true of wild, native fish in general. It's just easier to see in a closed system like Lake Crescent. If native fish are cut off from the ocean, they can adapt and thrive in a barren lake. If that lake is devoid of spawning habitat, they can evolve to spawn in stillwater. What's more, they can thrive there. A wild, native fish is a genetic legacy. Over thousands of years, it has been shaped by its homewaters; it is a perfect reflection of the place it inhabits.

HOW FAR CAN WADERS GO?



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WHERE SEEING IS BELIEVING IN HOPE

A testimony for Paul Engelmeyer's Oregon Coast Field Trips

WORDS

Rebecca Spencer,
Co-founder of
The Roving Dears

ABOVE

Photo: Ryan Lothrop

JOIN NEXT TIME

Rebecca and her fellow Roving Dears are rounding up river lovers for a spring field trip with Paul.

If you'd like to join, please let the Roving Dears know! You can reach them by email at rovingdears@gmail.com.

In nearly fabled fashion, Paul Engelmeyer has walked the tree tops and river beds of the central Oregon Coast for over 30 years.

We all know the story: dedicated stewards can shape the future and the survival of natural ecosystems depends on it. But what does that actually look like? When the road ahead is long, seek beacons of encouragement. Paul and a group of local advocates shine as brightly as they come.

We met Paul just south of Newport, Oregon. His finger traced the topographic maps, drawing the story he has to share: hundreds of acres, both public and private, for sensitive species that rely on coastal rainforest habitat.

Driving through sweeping slopeside forests shorn to stumps, Paul carefully described the impacts of deforestation: spawning beds wash away, water temperatures increase, deep holding pools fill in, diminished riparian growth. And yet, around the next bend in the road we were engulfed by healthy, bountiful habitat. In contrast to the devastation only a mile behind, a lively ecosystem all around us. It's here that Paul and committed stewards have protected lands encompassed by the Ten Mile Creek sanctuary, which has flourished with life returning to the refuge.

By cultivating relationships with land owners and encouraging them to adopt progressive land-management strategies, Paul and these dedicated individuals have changed the shape of the landscape for the better. Utilizing conservation grants, they purchase easements and secure private land access in order to restore important estuaries. These coastal wetlands are refuges for whole systems of creatures, such as the marbled murrelet and they are the nurseries for native Oregon Coast coho. This group of advocates devoutly believes in the hopeful work they are doing and they have watched the positive effects of restoration unfold.

The tour allowed us to witness natural systems being rebuilt. Two key elements seemed to be at the heart of this success: joy and dedication. Paul emphasized compassionate education and active community engagement.

Unsure, weary, and wondering if stewardship makes a difference? It does. It does and it is beautiful. So come for a ride, meet Paul, and see the future!

"Activism is the rent you pay for living on the planet."

—BRUCE HILL

WORDS

Tom Derry,
Director of Wild Steelhead Funding

ABOVE

Photo: Steve Perih

IN MEMORIAM:

BRUCE HILL

(1946 – 2017)

In September the world lost Bruce Hill, a conservation champion and inspirational human being. A month later, I attended his memorial in Terrace, British Columbia. More than 200 people traveled from across western North America to honor Bruce. It was one of the most moving experiences of my life.

Bruce was instrumental to some of the most important conservation victories in British Columbia. In his time, he helped protect the Kitlope Valley - part of the largest intact temperate rainforest on the continent - from industrial logging, the headwaters of the Skeena, Nass, and Stikine rivers from oil and gas exploration, British Columbia's north coast from multinational fish farms and Skeena River steelhead from commercial salmon nets. The list goes on.

In 2013, Native Fish Society honored Bruce with our first ever Lifetime Achievement Award. Bruce set the standard for, as he liked to say, "doing maximum good while having maximum fun." He loved life, taking pleasure in family, friends, wine, food and wild fish. He was an exceptional role model not just for conservationists, but for anyone who wants to make the most of their time on earth. I know I speak for everyone at Native Fish Society when I say I am grateful for Bruce's dedication and his passion. He inspired so many of us.

If Bruce inspired you, his family has asked that you make a donation in his name to the Skeena Wild Conservation Trust at skeenawild.org/donate.

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BELOW Fish! Photo: Ryan Lothrop

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Matt McQueen, Klickitat

Ed Megill, Skagit

Chris Menaul, Green/Duwamish

Matthew Mendes, Warm Springs

Mark Metzdorff, Lower Deschutes

Spencer Miles, Nestucca, Tillamook Bay Rivers

Bart Mills, Johnson Creek

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Marshal Moser, Williamson

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