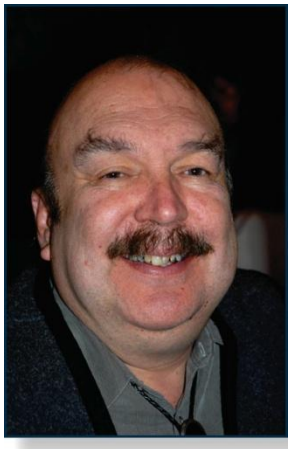
Tulalip Tribes:
Shoring Up a Damaged Ecosystem

The Tulalip Tribes' Fisheries and Natural Resources Commissioner, Terry Williams, is succinct in describing the environmental crisis that his and other Northwest U.S. tribes face: "We've lost 90% of the salmon population." For some 4000 Tulalip tribal members—2500 of whom live on the tribes' 22,000-acre -reservation on the eastern shore of Washington's Puget Sound—as with other Northwest U.S. tribes, that population crash is much more than an assault on their economic lifeblood—it is a cultural and spiritual threat to their identity as a people.

Subsistence is just one aspect of the tribes' relationship with salmon, but it has been crucial to a people who have shared a give-and-take relationship with the fish for thousands of years. That relationship continues, in diminished form, even after a catastrophic population crash that began in the 1980s. Disruption to the salmon's life cycle, says Williams, hits at the core of Tulalip's sense of balance as earth-dwellers and spiritual beings. Just one example: the Salmon Ceremony, held each spring, puts tribal members in direct touch with their ancestors. Other ceremonies and practices centering on the fish represent an important part of who Tulalip tribal members are as a people, and losing the fish is a blow that strikes at their core.



Terry Williams

The plethora of challenges that threaten to eradicate NW salmon can seem overwhelming. They include overharvesting off Alaska and Canada, habitat loss throughout the region, and the presence of dams and other water structures that restrict or block the migration of this anadromous species (salmon begin life in fresh water before adapting as a saltwater species by the time they move downstream from inland waterways and enter the sea). Pollution assaults the fish from birth to old age, and the multifarious impacts of climate change disrupt the population by changing weather patterns and creating conditions that damage the chemistry and temperature of water, from high country rivulet to ocean floor.

But just as few family members would deny a close relative support in time of need, tribal members continue working to sustain a being that has sustained them in so many ways from time immemorial.

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The Law vs. the Natural World

Treaties the tribes signed with the U.S. government were designed to guarantee the relationship between tribes and salmon would remain viable. But government violations of those treaties have been pervasive, and a long struggle has been necessary for Northwest tribes to regain a fraction of what was promised on paper. The Boldt Decision in Feb. 1974—following a painful period of demonstrations, protests, arrests and other disruptions collectively known as the "Fish Wars"—was the first modern victory in a series of wins that promised Northwestern tribes their fair share of salmon after non-native consumers depleted the populations, backed by laws that flew in the face of tribal rights and needs. Declaring that tribes were entitled to half the population of Chinook Salmon in their traditional, off-reservation fishing grounds, Federal District Judge George Boldt's ruling, for the first time, made the tribes co-managers of the fish with the state of Washington.

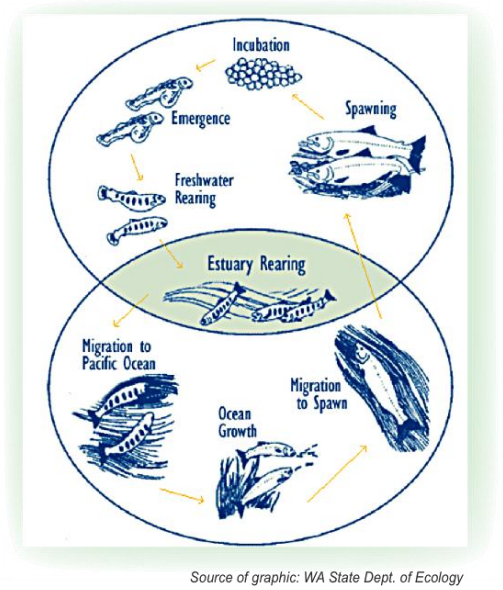
Tribes were buoyed by the ruling and mounted renewed efforts to regenerate their traditional, salmon-based lifestyle. For awhile it looked like they might be successful. More-recent rulings, such as one by Federal Judge Ricardo S. Martinez, have bolstered the tribes' position (a related suit was decided in the tribes' favor last April, requiring the state to alter water structures that interfere with salmon migration). For the first time in a century, the law has leaned toward the primacy of tribal members as stewards of their salmon brothers and sisters.

However, forces far more powerful that judges and legal codes have continued to deplete the salmon population and erode their health and that of other natural resources on which the tribes depend. Coping with a dizzying array of large-scale stressors on the ecosystem is now the primary challenge.

An Ecosystem in Chaos

Assaults on salmon come at all levels of their development. After hatching upstream, salmon (and steelhead, a trout that also migrates to and from the sea) fry travel down freshwater courses and enter the sea hours to years after hatching. In brackish estuaries, the fry make the change from freshwater to saltwater species in a process called "smoltification." Just two percent of salmon survive to adulthood in the best of circumstances.

Salmon Life Cycle



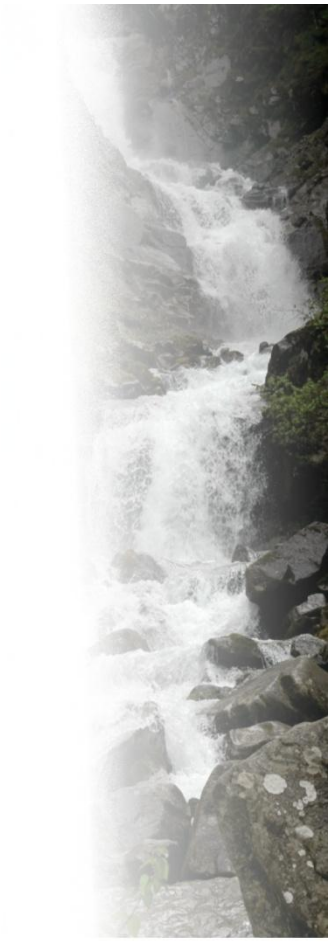
Source of graphic: WA State Dept. of Ecology

Depending on the species, the fish remain at sea for up to five years before returning to freshwater streams to spawn and leave new eggs, continuing the ages-old cycle. There have always been risks for the salmon on this epic journey, but human-spawned barriers, from concrete to chemical to atmospheric, make the trip more dangerous now than it's probably ever been.

Despite the promise of justice on the legal front, the salmon's ecosystem in and around the Puget Sound has all but unraveled. The reasons are many. Stresses begin in Earth's atmosphere, where air warmed by carbon and other greenhouse gases create a lethal web of disruptions. Patterns of glacier melt that for millennia created a welcoming environment for salmon along the Puget Sound have changed dramatically in recent decades. "We did our first climate assessment for the Snohomish Basin about ten years ago," Terry Williams says. "That told me spring flows, because of warming, were coming two to three months early." Tulalip Watershed Policy Analyst, Preston Hardison, adds, "Fall is longer and winter is delayed. Then when spring comes, it comes rapidly, one and a half to two months early. It throws everything off."

Rapid spring warming, on top of a shorter winter that each year diminishes glacier buildup, causes runoff that once came in gentle pulses down the mountain to descend oftentimes in a torrent. Warming impacts, aggravated over the past century by forestry practices that have stripped the high country of old-growth trees and absorbent duff (litter that coats the forest floor); lacking its earlier absorption capacity, the forest releases more water more quickly, leaving less for the immediate ecosystem and for underlying aquifers.

“All this is destroying salmon habitat in the river systems,” Hardison says, “carving out channels and destroying side habitat where salmon go to get out of the main channel. So they don’t have that resting, foraging, and predator-protection.” The spike in runoff also carries more sediment into streams, interfering with salmon development. Warming, along with forestry practices, impacts mountain streams large and small by denuding their banks of vegetation. This warms the water and creates barren banks whose soil can be swept downstream by heavy flows. Quick runoff prevents adequate aquifer recharge, and so streams once fed by cool subsurface water more conducive to the salmon’s needs now average higher temperatures, further stressing the fish.



Changes in the water cycle also impact the health of salmon. Whereas slower runoff once allowed fry to gradually make the transition to saltwater, now they’re rushed through the freshwater system and dumped into the sea too soon in their development, making them more susceptible to illness and predators. Estuaries have been damaged by runoff and chemical changes, and hiding and feeding habitat have been denuded in areas where young salmon once found protection as they made the change to sea-going creatures.

Pollution adds to this toxic mix, not the least being the million tons of human and animal waste that enter the Puget Sound each year. Only partially treated, that waste stream includes all the poisons of modern society along with fertilizer that feeds the overgrowth of algae and other ocean vegetation, which strips the Sound of oxygen during decomposition.

“It’s a messed-up system,” Hardison sums up. “We’ve really created havoc.”

Small Steps, Big Impacts

The magnitude of these combined problems can seem too pervasive for any effective response, but that hasn’t stopped regional tribes from acting where they can. Tulalip’s approach could be described as “top-down.” To respond to disruptions in the timing and rate of runoff, the tribe is now in discussions with high-country land managers that include the U.S. Forest Service, U.S. Army Corp of Engineers, and Washington’s Department of Natural Resources. One “high-level” approach they’re exploring: creating upper-elevation snow reservoirs to capture glacier and snowmelt rather than allowing it to rush quickly down to sea. “One of Preston’s contacts with the Convention on Biological Diversity,” Williams says, “sent us *Scientific American* articles and photos of a similar project they did in the Himalayas. Over 5000 feet up they put in a dam to catch water instead of ice. It’s working there, and we think it can work here, too.”

“If we create high-elevation snow catchments,” Hardison explains, “when snow melts, instead of just rushing down the mountain it’s captured in the reservoir as water, and the flow can be regulated and released in a more natural way.”

Although that project remains theoretical for now, the tribe is much closer to actually constructing a series of wetlands farther down the mountain that will provide habitat for young salmon while helping to buffer torrential runoff from the high country. “We’ve done the feasibility study on this already,” Williams says. “We’re looking at 250 acres, a small lake. What it finally got down to was

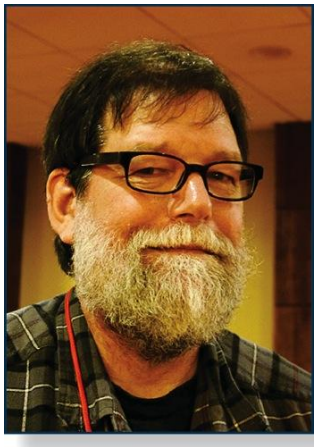
talking with federal, state, and local agencies to get permission to have a sand-and-gravel operation come in and dig holes for wetlands. We'll sell the sand and gravel to pay for it. Over a seven-year period this should produce about ten million dollars. That money will help us pay for construction of other wetlands throughout the basin. We need a whole basin full. This first one will be a kind of bank for the rest of the basin."

The wetland buffer will help support salmon fry as they make their way to the sea. The wetlands will help, but other challenges will continue, including warming water, pollutants, lack of cover and foraging habitat, and sedimentation from eroding shorelines.

Williams says the tribe is talking regularly with local developers to find ways to ease pollution in the region. Revegetating streamside banks will help improve riparian habitat while also easing the sedimentation problem. The wetlands, and possibly the high-elevation impoundments if realized, will help ease snowmelt back into the aquifer. The emergence of groundwater will help cool the streams it feeds, returning them to salmon-friendly temperatures closer to their historical levels.

Planet-Scale vs. Local Action

Ocean acidification is an international-scale issue that threatens the health not only of salmon but of plankton, the foundation of the ocean food system, and of shellfish, such as butter clams, on which the tribes also rely. "There are episodes of highly acidified water at times," Hardison says, "and it actually dissolves the shells. But even at lower levels you get interference with development, and some shell erosion. It's especially harmful to the youngest critters, before their shells have hardened."



Preston Hardison

Caused by increased carbon-loading from the atmosphere, acidification tends to draw less attention than the more-general, but closely related, issue of climate change. "You can argue all you want about global warming," Hardison says, "but the fact that the ocean is getting more and more acidic is not open to debate; proving it is a matter of measuring the chemistry. Carbon is just raining down on the ocean, and lowering the pH. Right now we have a 50-year ocean-wide carbon debt, meaning there will be 50 more years of acidification even if we waved a magic wand and got all the [carbon sources under control]. And we know that won't happen, so we're looking at a minimum carbon debt of 70 or 100 years."

Despite the magnitude of the problems, Tulalip tribal members are not willing to sit back and watch the clock. There is a way, Williams and Hardison agree, to mitigate the worst impacts of acidification on salmon and other sea creatures, at least on the local level. That strategy involves restoring seaweed, kelp, eelgrass and other marine vegetation to coastal reaches. Doing so not only will provide shelter and foraging areas for young fish and other marine creatures—including the plankton and forage fish that provide a crucial early link in the food chain—but can create microhabitats of lower pH in which salmon and other marine creatures can get a relatively healthy start for what will be a long, difficult struggle. Restoring vegetation can also help to reduce shoreline erosion, which is stealing away coastal reaches and threatening to devastate the land base of their more-exposed neighbors to the north, the Swinomish Tribe, who face a potential 20% loss of their reservation land from such erosion.

"Time is the enemy," says Hardison. "We believe we have to move quickly on all this." The

reasons are many: legal, political, cultural, and spiritual. “The tribes are fixed by treaty, by their ancestors, and by their relationships to the land. They can’t move. If species move away from tribal territories, they’re lost to the tribe. This is why we have to act quickly to restore the health of the ecosystems, to keep as many species at home as possible in the face of this major event of climate change. We’re also concerned about ‘tipping points,’ or thresholds. If the ecosystem is stressed beyond normal parameters, it can collapse.”

True North

Some argue that tribes bear an unfair burden in the climate change fight because little of the greenhouse gas that fuels the problem is generated by tribal communities. Williams says, “I’ve heard that argument for 30 years: ‘Why do we have to do this?’ Well, because it’s in your teachings. We were taught that we’re the caretakers of the land. The U.S. took it away, but it’s still our land. I tell our people that if nothing else we can set the example, a bar that people will recognize. Through our history we’ve maintained a high moral standard. We didn’t need contracts; we knew what the rules were, and we stood by them. We are the compass.”

References

- Tulalip Tribes website: http://www.tulaliptribes-nsn.gov/

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The profile is available on the Tribes & Climate Change website: www4.nau.edu/tribalclimatechange/. The tribal climate change profiles featured on the website are intended as a pathway to increasing knowledge among tribal and non-tribal organizations about climate change mitigation and adaptation efforts.

For more information about the tribal profiles and the website, contact: Sue Wotkyns, Climate Change Program Manager, Institute for Tribal Environmental Professionals, susan.wotkyns@nau.edu