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My name is Tim Troll. I came to Alaska in 1978 as a VISTA volunteer attorney for Alaska Legal Services in Bethel. Since then, in addition to practicing law, I've served many years as a rural city manager and CEO of an Alaska Native village corporation. I have also spent some time crewing on commercial fishing boats on both the Lower Yukon and in Bristol Bay. I am currently the Executive Director of the Bristol Bay Heritage Land Trust, an organization I helped found fifteen years ago while living in Dillingham. The Bristol Bay Heritage Land Trust is one of six land trusts in Alaska that serve different geographic areas. Our service area encompasses the watersheds that flow into Bristol Bay.



Land Trusts are conservation organizations that work with willing landowners to preserve places that are special – working farms, wilderness, parks, historic sites and, not surprisingly in Alaska, salmon habitat. We exist because 25 years ago the Alaska legislature adopted the Uniform Conservation Easement Act. A conservation easement is a statutory creation that allows a property owner to sell or donate development rights to a qualified organization while retaining ownership. Together we estimate our trusts have conserved over 40,000 acres of open space, wetlands, wildlife habitat, areas for hunting, fishing, hiking and subsistence, 8 working family farms and well over 50 miles of shore line along salmon streams.

So why would a land trust care about the water? When we formed our land trust in Dillingham in 2000 it was out of concern for salmon. The Nushagak is a giant producer of salmon in the nation's greatest salmon stronghold - Bristol Bay. It supports a robust subsistence culture and a commercial fishery with a longevity approaching 150 years. The 20-year average for abundance of sockeye salmon alone in the Nushagak River is 1.8 million with a range of 674,000 to 3.4 million.

Our concern in the Nushagak is that most of its salmon habitat is not conserved. The vast majority of the watershed is owned by the State and is managed under an area plan that does not guarantee permanent protection for salmon habitat. The uplands along the lower river corridor are private lands owned by five Alaska Native corporations and more than 300 individual Native allotment owners. Looking into the future and taking an admittedly jaundiced view of human nature we could foresee a time when this fragmentation of ownership and land management in the Nushagak

watershed could lead to habitat fragmentation and the loss of connectivity between the lakes, rivers and streams these salmon need to survive.

To get ahead of history we helped the Nushagak-Mulchatna Watershed Council develop a conservation plan called the *Nushagak River Watershed Traditional Use Area Conservation Plan*. In addition to strategies to protect land, the Council outlined strategies in the Plan to protect water. Key among the water strategies is documenting salmon streams and submitting previously undocumented streams for inclusion in Alaska's Anadromous Waters Catalog. Once a stream is in the catalog it cannot be disturbed without a permit from the Alaska Department of Fish & Game. (ADF&G). ADF&G requires more stringent permit requirements if a stream is in the Catalog. Most of the streams in the headwaters of the Nushagak are undocumented because they are remote and can only be accessed with a helicopter.

We launched our effort in the late summer of 2008 with funding and other support from various partners including the tribes of the Nushagak River, The Nature Conservancy and Bristol Bay Native Association. The biologists we engaged sample streams using backpack electro-fishing in accordance with protocols established by ADF&G. Sampling is done in late summer when rearing salmon have generally gone as far up into the headwaters as they can. Fish are stunned, identified, measured, occasionally photographed, and returned to the water. All sampling sites are geo-referenced and each year before September 30 we submit all the information we gathered to ADF&G. Salmon observations are added to the Anadromous Waters Catalog and other fish observations are added to Alaska's Freshwater Fish Inventory.

I have been fortunate to go along on many of these sampling trips. Over the last 6 years I've stood in many little tundra streamlets barely a foot wide, burrowed down into alder choked creeks and sunk up to my waste in muddy bottom sloughs. To my astonishment we have found fish in all of these places, and often salmon. Particularly surprising for me was to land near some isolated pocket of water above a dry streambed and still find rearing coho salmon. No surprise to our biologists, or to the Native folks who joined us on our surveys.

We have sampled hundreds of headwater streams in Bristol Bay and points along those streams looking for fish. We find fish in virtually every place we sample and salmon in most. We have raised and spent hundreds of thousands of dollars to add hundreds of stream miles to the Anadromous Waters Catalog. All of this data is being processed into a model that hopefully will help us understand the physical and biological factors in this region that likely determine the extent of streams occupied by salmon and other fish. Such a model will be helpful for predicting where fish are and what fish are likely to be at any given location without having to fly a helicopter to the thousands of small streams and ponds that have not been sampled, and likely never will.

But it doesn't take a biologist, or even a scientific model, to help us understand the significance of these little creeks, mud holes, backwaters, side sloughs and even ephemeral and intermittent stream channels. Even a lawyer like myself must concede the obvious – these places are the perfect breeding ground and rearing habitat for our salmon and a wide variety of other fish. Certainly, in this region, firm protection of these headwater complexes should be a given. The Clean Water Act rulemaking affirms protection for these headwaters and ephemeral streams. Without protection everything downstream could be lost – no commercial fishery, no world class fly fishing, no bears, no belugas, no Natives, no economy. No reason to protect the land.

As a result of our sampling and sampling conducted by ADF&G and others it is possible to generate the following map showing which headwater basins in the Nushagak watershed are used by salmon. All of them are used by fish.

