

Alaska Region Fisheries Podcast Transcript

PART 1

Katrina Mueller (USFWS Fisheries Outreach Coordinator): Warm greetings from the Fisheries Program in Alaska! Where thriving native fish populations are not only the lifeblood of Alaska's ecosystems, but also form the foundation of subsistence lifestyles, support world class commercial and recreational fisheries, and are worth billions of dollars annually to the State's economy.

For example, Bristol Bay produces over 50% of the world's sockeye salmon. Robin Samuelson has been a commercial fisherman since he was a teenager and his family has fished Bristol Bay's waters for 1000s of years. He talked to us about his family's deep connection to—and dependency on—the Bristol Bay salmon fishery during the 2011 Southwest Alaska Salmon Science Symposium, which was sponsored by the U.S Fish and Wildlife Service, The Nature Conservancy, Alaska Sea Grant, and the Alaska Department of Fish and Game.

Robin Samuelson (Bristol Bay Fisherman):

Today I sit back, I have five grand children, three of them in Dillingham, three boys in Dillingham. The oldest grandson I have is 11 years old. He's fished with me. My 10 year old grandson has fished with me. If you ask them what they want to do next summer they say "oh we're fishing with poppa." And that's the same way I grew up in Bristol Bay. And you know, I probably have another five years...maybe six years in the fishery. They're going to end up with my permit. That permit has paid for my daughter's education; it's paid for my son's education. My daughter went to Stanford University, she was a top entering freshmen, beat out 16,000 other freshmen...became the President's Scholar, got awarded the President's Scholar. That's all fish. That's all fish money. Our people out there have relied on the fisheries as I said for 1000s of years and then the commercial fishery happened. We have a lot of young people in the sport fishery out there today. It's very diversified. And I don't think there's any holier water than Bristol Bay. Not just because I'm there, and living there, but because what that thing can return

Katrina: Despite Alaska's reputation as a pristine wilderness, and the fact that none of its fish species are currently considered threatened or endangered, Alaska's fish – particularly those that are migratory – are still vulnerable to – and exposed to – habitat fragmentation and degradation.

The Service's Alaska Fisheries Program works with local, state, federal and tribal partners, and in cooperation with other Service programs, to assess and monitor Alaska fish populations and their habitats; inform habitat restoration and landscape planning; provide summer work and education opportunities for the next generation of conservationists.

I'm here with our Fisheries Program Coordinator for Alaska: Rod Simmons. Rod, what are a couple of the migratory fish species the Fish and Wildlife Service Fisheries Program focuses on in Alaska and why is it so important for them to have free access between a variety of habitat types?

Rod Simmons (USFWS Fisheries Program Coordinator): Well I think I'll answer the last question first. I think it's important to point out that there's very few species here in Alaska that reside in one location so we need to keep access open for their migration requirements,

whether they be anadromous species [that migrate up their home river from the sea to spawn], such as salmon, or resident species that [stay in freshwater but] also have long-distance migration routes because of their complex life history.

Also for me, I think the answer comes from nearly one hundred years of past mistakes we've made relative to fisheries conservation and what's occurred from habitat fragmentation from urban development and agriculture where fisheries conservation was not included in land use practices. In a place where I grew up in the Pacific Northwest, Pacific salmon in that area have certainly experienced a lot of declines and very expensive restoration efforts because of the lack of consideration in relation to hydroelectric development, agricultural practices, and road construction practices. All these things have influenced the outcome of Pacific salmon productivity in that area. In Alaska, I think we have the good fortune of learning from those lessons and hopefully having a different history one hundred years from now...looking at hopefully healthy salmon populations and continuing this legacy of salmon sustainability here in Alaska.

I think as far as an example of a fish species here in Alaska that epitomizes the need for considerations of their migration is Yukon River Chinook salmon. They have some of the longest migrations of any salmon species in the world, originating in the upper Yukon in its headwaters 1,600-1,800 miles from the Bering Sea. These fish make this incredible long-river migration to spawn, subject to subsistence harvests and commercial harvests along their journey. Once they reach these headwater areas to spawn, juveniles remain in freshwater for several years and don't reside in necessarily the place where they originated from. They make a slow migration downriver and utilize tributaries on their out-migration back to the Bering Sea. So it's important to keep fish passage and migration corridors open basically throughout the entire Yukon drainage. So we have to consider not only major river migrations, but also tributary migration corridors. This is where in the larger rivers where hydroelectric is typically a consideration – we have to be concerned about that in the larger rivers. We have to be concerned about road development practices and other things that can impede migration of juvenile fish typically up in the headwaters, in the tributaries.

Aside from the salmon, another good example of considerations of migratory fish requirements is our white fish species in Alaska. Even though they may be resident species that don't migrate to sea, they also have migration requirements that are oftentimes several hundred miles in length.

Many of our white fish species have complex life histories where they will move from summer feeding areas in one location of a river drainage and then move down in the fall to overwintering areas which are totally isolated from those feeding areas and are sometimes hundreds of miles apart. And then in the spring, they'll move back up into areas to feed and ultimately to spawn again in the fall. We have to make considerations of these life history patterns for whitefish species and other resident species just as well as we do for the salmon.

Katrina: That's it for this week. We hope you join us next week for the second half of the Alaska Fisheries Program podcast – we'll hear from a university professor that's been involved with a long-term salmon habitat study in Southwest Alaska, the Alaska region's fish passage engineer, a fishery biologist studying salmon in the Matanuska-Susitna Valley, and our Alaska National Fish Habitat Partnership Coordinator.

PART 2

Katrina: Last week we heard from a commercial fisherman operating in Bristol Bay about the economic and cultural importance of healthy, sustainable wild fish populations, and also from our region's Fisheries Program coordinator, Rod Simmons, about how important it is for fish to have free access between key habitats. Fish also need options: species that aren't forced to put all their eggs in one basket tend to do well over time, even if certain populations experience periodic downturns. Daniel Schindler, a professor in the School of Aquatic and Fishery Sciences at the University of Washington, highlighted this in a talk he gave during the Southwest Salmon Science Symposium titled "*The value of intact landscapes for sustaining salmon and their fisheries*"

Daniel Schindler (University of Washington researcher): Why are salmon fisheries in Bristol so productive and so sustainable over such a long time period? The metaphor that we've started using that I think is useful for thinking about how you wrap your brain around all these processes going on. And the metaphor here is a portfolio, just like an investment portfolio that some of you may be putting your money into. And the way to think about this is you have a hierarchy of very coarse-scale dynamics at the scale of Bristol Bay—this is where the commercial fishery operates—and it's capturing fish that are returning to their home streams in nine major rivers. And each of those major rivers has dozens, if not hundreds of genetically distinct individual populations that occupy individual pieces of that habitat mosaic. And this whole system is being pounded by water and wind and temperature etc., and just like a stock portfolio, where you have stocks that maybe aggregated up into mutual funds that are then aggregated up into your retirement portfolio, the aggregate is much more productive and much more reliable than any of the individual stocks that contribute to that overall portfolio. And the reason you get stability at the big level is because all of the populations don't boom and bust in same years: they compensate for each other through time.

So the argument is that diversity in the landscape—diversity in the habitat—produces diversity in the biology and this spreads risks to variation in the environment and stabilizes the fishery and therefore the people that rely on it.

Katrina: Our activities on land, or in the water, can prevent or hinder fish from accessing critically important habitats during key stages of their life cycle, or make those habitats unsuitable for spawning, egg incubation, and rearing. I'm here with Bill Rice, who's our fish passage engineer for the state of Alaska: Bill, What's a common type of man-made barrier that hinders or prevents fish passage in Alaska that many people may not even be aware of?

Bill Rice (USFWS Fish Passage Engineer/Hydrologist): Culverts are everywhere there is a road or trail. Most people don't think of them as barriers because they are on small streams

away from the rivers people fish. In the past, culverts were typically undersized and designed only to pass water; resulting in jump, velocity or water depth barriers for fish. There is better data and more controls now with new installations, but it is still a challenge to size them correctly. The best data we have suggest around 5,000 to 10,000 culverts in fish bearing streams in the state and around 70% of them potentially some kind of barrier.

I would say the other most common barriers that people may not be aware of are fences and water extraction areas. People don't realize that the wire on a fence can be a barrier and also collects debris, they just want their farm animal to not go downstream. It is also fairly common in the more rural areas to extract water from the creek for home needs and a simple way to do that is erect a small barrier of wood or rock to create a pond for the pump and a fish barrier is created.

Katrina: So what are some of the key things that need to be considered when designing a "fish friendly" road crossing?

Bill: For our program, it is all about mimicking the stream being crossed. In other words we ideally want the fish to be able to swim under the road or trail without even really knowing they've gone through a crossing. We embed the culvert in the streambed so it's there's a natural bed of material through the crossing, and simulate the stream's dimensions through the road to maximize the ability for fish and other aquatics to move upstream or downstream. In general this entails selecting a reference reach—so a natural upstream or downstream section of the stream that isn't impacted by the road or trail—and assessing key morphological features such as slope, width, and depth. These are used to correctly size and place the culvert to pass fish, including juvenile salmonids or species that aren't strong swimmers like grayling. Substrate information from the reference reach is used in the design of the streambed through the crossing and sometimes the streambanks. It is important to have roughness—like when you look at a riffle and see different sized rocks that fish can hide behind and get out of the current for a moment—so this roughness essentially creates a diversity of velocities fish can use in navigating through the crossing, just like in the natural environment. It's important to keep in mind fish are moving all the time, trying to maximize their food intake, be successful at spawning, and not get eaten by predators, etc.

Katrina: And finally, what's the most innovative fish passage project you've been involved with in Alaska so far?

Bill: I would say the most innovative was a culvert to bridge project recently constructed where we had to use a combination of bridge construction and stream re-alignment. Basically the original crossing was too small, and it was located where the road curved. We wanted to put a bigger crossing that would pass fish—a bridge—and so we had to move the stream channel slightly to better accommodate the bridge. In this case, putting the bridge in was the preferred option to maximize fish passage and accommodate a 100 year flood event. Through extensive survey of the creek we were able to recreate an entire meander bend with essentially all the same slope, width and depths as the original, with a series of pools and riffles to reference conditions through the new crossing.

Katrina: I asked Jon Gerken, a Fisheries Biologist based out of the Anchorage Fish and Wildlife Field Office, to give me an example of how the Fisheries Program is helping prioritize local fish passage restoration efforts by studying the movement and distribution of salmon.

Jon Gerken (USFWS Fisheries Biologist, Anchorage Fish and Wildlife Field Office):

Katrina, currently we have a project located about an hour—45 minutes to an hour—north of Anchorage to the Big Lake area, and the idea is to tag juvenile coho salmon with “PIT” tags—Passive Integrated Transponders—about the size of a grain of rice. We implant them in their abdominal cavity and set up a bunch of fixed arrays throughout the system to monitor the migration of these fish year round...and [we] also use a lot of other mobile tracking to catch these fish throughout the season. And the idea is to eventually to figure out where these fish are going, what habitats they are using, to make more informed decisions on which culverts or which areas are problematic for fish migration. And the idea is to make an optimization model so we can better use our money for fish passage projects as the final result.

Katrina: I'm here with Cecil Rich, our National Fish Habitat Action Plan, or "NFHAP", coordinator [now the National Fish Habitat Partnership, or NFHP]. Cecil, in the context of conserving fish habitat in Alaska, can you talk a little bit about Fish Habitat Partnerships in Alaska, why they came about, and give a brief example of how a partnership has brought people together to improve fish passage?

Cecil Rich (USFWS NFHP Coordinator): Alaska has three Alaska-based Fish Habitat Partnerships that have formed over the past few years in the Matanuska-Susitna Basin, Southwest Alaska and the Kenai Peninsula. These partnerships consist of variety of players including state, local and federal agencies, and tribal entities and non-profits that each bring their unique resources and abilities to collaborate on high priority fish habitat protection and restoration needs with the goal of keeping Alaska's fish populations healthy and abundant.

The Matanuska-Susitna Basin Fish Habitat Partnership came together to identify some of the threats to healthy fisheries. Road culverts not designed with fish passage in mind were one of the primary threats. Over the past several years the Partnership has improved fish passage at almost 50 road crossings. Two of these were on Eska Creek, which flows into the Matanuska River. This system supports coho and Chinook salmon resources that are very significant to the Chickaloon Tribe and other local residents. The Chickaloon Village's Environmental Stewardship Program took the lead in a collaborative project involving the USFWS Fish Passage Program, local contractors, the Alaska Fish and Game and Department of Transportation in repairing these significant barriers to fish passage. This resulted in increased access for salmon to their historic habitats as well as important movements of resident fish.

Katrina: If you're interested in learning more about how the Fisheries Program in Alaska is contributing to the conservation of fisheries and fish habitat in Alaska, visit [Alaska.fws.gov/fisheries/](http://alaska.fws.gov/fisheries/) [<http://alaska.fws.gov/fisheries/fish/index.htm>] and click on fisheries. From there, you can browse the Kenai, Fairbanks, Anchorage, and Juneau Fish and Wildlife Field Offices [where we have Fisheries staff based] and also like our facebook page [<http://www.facebook.com/USFWS.AK.Fisheries.Habitat>] to get timely updates about what the Service and partners are doing to conserve fish and their habitat in Alaska! [Also check out our habitat programs: <http://alaska.fws.gov/fisheries/restoration/index.htm>]