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This interview was conducted with James Michael Johnston (February 18, 1943 - June 13, 2021) on Thursday, December 19, 2013 in Western Libraries Special Collections on the campus of Western Washington University in Bellingham, Washington. The interviewers are Tamara Belts, Danny Beatty and Paul Piper.

TB: Today is Thursday, December 19, 2013, and I'm (Tamara Belts) here with Jim Johnston, Danny Beatty, and Paul Piper. We've just signed the Informed Consent Agreement, all the interviewers also signed, and we're going to do our oral history with Mr. Johnston.

So, our first question is always: How did you get started fly fishing and fly tying?

JJ: I found an old fly rod in my dad's unused section of the garage, and I couldn't picture what a rod that size, how it would be used. I'd never seen a fly fisherman. I dug around in the fly case, or excuse me, his tackle box a little bit, and I found a reel with a line on it. The line was so old it was stuck together and I couldn't take it off the reel. It was literally, the finish had absorbed or melded into one another. I eventually got it pulled apart, and I asked Dad about it. And he said, "Go ahead and use it if you want."

Well, I didn't know how to use it. I didn't know anything about this, but it so intrigued me that I, by the end of summer, had learned how to cast at least the length of the rod in the middle of the street.

I picked strawberries every summer. I was 10 years old, and I picked strawberries and made about $50.00 a summer. And I took that money and decided I'm going to be a fly fisherman. Mainly because he had one fly left in his case, and I treasured it for years until I got seduced into using it on a fish like that (referring to a picture he had brought). The fish has still got it.

It was a *Montana Bucktail*, made out of deer hair, the most gorgeous thing I had ever seen that someone had made, and I wanted to learn. So, the drive of it being Dad's tackle that he no longer used and the beauty of the fly and everything, made me go in and spend my $50.00 at the Everett sporting goods store. I don't know the clerk's name, but he was patient and helpful and made sure my money went probably twice as far as it should have. But he got me started, and he said – he gave me a note to take to a shop on the east side of Everett, on the other side of Old 99, and it was Ed Johnson's Fly Shop. I got my dad to drive me over there, and I went inside, and he wouldn't go with me, he let me do things on my own, which I appreciated.

I wanted to buy some material, and I had a few dollars left. Ed Johnson was like a mentor, and he showed me stuff, he says, "No, you don't want to buy that. This is what you want. No, you don't want to do that." He said, "I've got a fly here I want you to copy, and I'll give you the material for it. And if you tie

them well enough, I will buy them from you." Thus, started at age 10 ½, my commercial fly-tying career, which helped put me through two years of the University of Washington and a vehicle and so forth. And more fly-tying material than I will use in a thousand years. You start collecting this stuff.

But he started me, those two gentlemen and my dad. And I hadn't, up to that point, I had not cast upon a stream. I was just so totally confident that this is a sport that I wanted to learn everything there was to know about it. And that's been 60 years ago. It's never let me down yet. It's been interesting.

TB: When did you first hit the stream, then?

JJ: My folks drove me up to a small stream on the upper Skagit River, I don't even remember the name, and I took that *Montana Bucktail*. I didn't know how to cast, and I certainly couldn't cast with that 9-foot leader, I couldn't get it out and get to the fly line. I had a lot to learn. But I would dabble, because I had fished for a long time up to age 10.

When we moved to Marysville from Olympia, that was prior to Fifth grade, I found Allen Creek, just outside of town, and every day after school I would go down there with a little spinning rod or a stick and a worm or an egg, and it wasn't much wider than this table, and I would study the fish that would come to the fly. I didn't know what they were. Gradually I learned what the Coho fry were or the fingerling, and the cutthroat and sea run, and the rainbow, which would have been steelhead juveniles, and how they occupied different areas of the stream. I figured that, okay, when they get bigger, they'll probably occupy a similar type of area, and sometimes they did and sometimes they didn't.

But I learned on a worm, and I thought it was grossly unfair, totally unfair. And when I tried an artificial fly (I didn't dare try one I had made myself yet). I couldn't believe that they would catch fish. I tried one that I had purchased, because I didn't want to lose that *Montana Bucktail*. It stayed for special use in the years ahead. I tried something that was rubber, it was an ant, a rubber ant, because I couldn't believe any creature as smart as a fish would eat something made of feathers. So I wanted something that looked like a real thing, not a worm, but a manmade object. And they wouldn't leave it alone.

So, when I went up in the mountains, I took some flies that I had tied, when my parents took me up to the stream. It may have been Buck Creek, I'm not sure, but I did the same thing, dappling in the same type of water, and I couldn't keep the fish off. Then I got real brave, but I didn't – there was this huge hesitancy to try one of the flies I had tied. I couldn't believe I could tie something that would fool a creature as smart and beautiful as a fish. And it did. I was so elated that I went to Ed Johnson's and I was just jumping up and down, excited, everything else. He couldn't stop laughing.

He gave me some material, didn't charge me. He says, "Take this and tie up three dozen of those flies and bring them in and I'll buy them each from you at 25-cents apiece." Oh man, that started it!
And my mom perhaps understood even better than my dad. My mom was an excellent seamstress and had very good hand-eye coordination, and she would marvel over the flies. She had a huge collection of materials for sewing. She saw that I was accumulating a huge collection that didn't exactly go with my allowance, and so I told her that I was selling them. She was really pleased and certainly encouraged the hobby.

And I, to this day, have bags and bags and bags of material, most of which, as I went to the University of Washington, there's a taxidermy, in Seattle, Jonas Brothers, and I would buy twenty-five pounds of the finest belly hair from a polar bear that you have ever seen, for $2.00. You know, now it's about $25.00

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for a small piece of that. And every kind of animal from all over the world, so I had this ready supply of materials to try, and it just blossomed into my art work. That's how I got started.

TB: So, did you know – you've talked a little bit about some of the people, like Ed Johnson, that influenced you. Did you know some of the legends like George McLeod, Ken McLeod or Al Knudson, that were from the area?

JJ: I met most of those people, but I don't think in terms of legends, I don't. I think in terms of people that are patient, understanding, and want to share their art. If you called them a legend, they would be embarrassed. That's the kind of people I like.

I couldn't call anybody I know [a legend], except maybe – I met Roderick Haig-Brown. I read all of his books. I was absolutely intrigued with his knowledge, and I learned so much from him. When I was 21, the director of the Salmon Commission in British Columbia, where I was working on my first summer job, and he called up to the camp. He became my mentor, or he decided early on to be my mentor, and I was so fortunate in that. But he wanted me to drive this person who was a commissioner for the International Pacific Salmon Fisheries Commission, joint US-Canadian agency, managing sockeye in the Fraser. He said the name, but I didn't, you know, make a person that I idolized as an author into a real person. And we sat and went from 150 Mile House into Horsefly Lake area. He appreciated me driving, and he talked so much and asked me so many questions. And you know, he was asking who I read, and I said, "Well, I've" (because of my memory for names is infamous) I said, "I really like Roderick Haig-Brown and his *Western Angler* book." "Oh, you do?" And he caught on right away that I didn't know who he was, I couldn't have remembered. He says, "Well, would you like a signed copy?" "I'd love any copy." And one appeared in the mail.

TB: Terrific.

JJ: Over the years, I exchanged a couple phone calls and a couple or three letters, and it was a unique relationship – I mean, I was sorry I started to idolize him because reading him and listening to him talk, this legend idolizing got in the way of hearing the message. It's a kind of thing that elevates it to a truism when in fact, he really wants you to question him. He wanted you to debate him. He wanted you to show another perspective from your own experiences. And he would question me that way, and it would be a bit unsettling. What can I tell this person that he doesn't know a hundred times over?

So, all these people that I have met in Washington Fly Fishing Club and, oh, Fidalgo Fly Fishers, Bellingham, California, Oregon clubs, and so forth, and BC, and the professional biologists and so forth, I grouped them all together and considered them all friends, even before I met them, because we have a commonality, fish and fly fishing. It doesn't mean I don't do other – my uncle who taught me how to cutthroat fish, Uncle Paul, was the world-famous worm/nightcrawler fisherman on the Stillaguamish River below Arlington, and he taught me so much, and I loved being out with him. I was able, fortunate, to take him out his last two fishing trips before he passed away, and that was the best thing I could do for him. So, all these people who have come together and given me information and taught me and are individually, regardless of whether they've ever published a word or tied a fly, they're all just in that category of unique, special people that I always enjoy their company. And if they're legends, great.

DB: I was going to insert that there was one fellow in high school, a teacher of yours, that you've kept in touch with all these years.

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JJ: Yes.

DB: And that is?

JJ: Deene Almvig.

DB: Yes, and he told me that you, that he allowed you to tie flies in high school. Is that true?

JJ: Well, he legalized it by asking me if I'd like to be in a club.

DB: Oh, that's –

JJ: And I said, a club? Yes, we'll start one right here. You get some of your friends together and I'll/we'll, you know, teach all of you about steelhead fishing on the Pilchuck River. And I would go up at lunch hour to his office, and partly there was a girl sitting in the office having lunch who is my wife of 46 years, but I would go in and, yes, he'd show me some steelhead patterns. He had a polar shrimp that was just deadly, and I still have it.

DB: It's featured in Trey Combs' book, isn't it?

JJ: Yes.

There are so many of these special, special people, and he was one of my first mentors. I've mentioned that word before. I am who I am today because of a Fifth grade – my first male teacher, who I know my mom talked to about giving me some opportunities to expand and grow. My teacher's idea of that was to make me school bus patrol. It worked, but these mentors appeared, and Deene Almvig was one of those right up there, a captain of mine in the navy, Cliff Millenbach was a fisheries biologist, and Loyd Royal was a fisheries biologist.[1] I've just been so fortunate that way that I've tried to be a mentor to a lot of others, and a teacher. Anyway.

TB: So, what made you decide to go into it professionally, become a fisheries biologist?

JJ: Well, I decided to go – I never even thought about it. Who can make a living on this? I wasn't going to make a living on fly tying. I could do 4,000 flies in a summer, but it was ruining it to me for a hobby. I'm right-handed, left-eye dominant, which caused me no end of problems when I was flying for the navy and trying to land on an aircraft carrier at 170 knots. My instructor finally caught on that I was closing one eye. Because I'm right-handed, and yet here's – and if I close that eye, the object jumps. If I close my right eye, it stays in the same place. I have great difficulty shooting a shotgun without keeping both eyes open, because I fire behind it. And it became a problem on fly tying.

Here I am sitting at a desk for endless hours and I'm tying; they bought me a desk, it was for a left-handed person. So, I've got this right-hand, left-eye dominant, tying flies left-handed, and it did wind up creating a bit more eye fatigue and strain. So, I wasn't ever going to make a career that way. I decided

[1] Cliff Millenbach was Chief of the Fisheries Management Division of the Washington State Department of Game in the early 1970s. Loyd Royal was appointed Chief Biologist of the IPSFC in January 1949, Acting Director in August 1949, and Director in December 1950. He was Director until his retirement in March 1971. He was retained by the Commission as a consultant for a period of two years.

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I'd go to the University of Washington because they had a school of dentistry, and I decided back in high school I wanted to be a dentist, because of the dentist in Marysville, Dr. Pitts. He would talk to me about various medical careers, and I decided I would be a dentist.

Well, the School of Dentistry, and the medical building are right side by side, and just downhill is the College of Fisheries. And I would eat lunch out on the lawn at noon, and I smelled fish, and I followed my nose and I found this fish ladder going into a pond outside this building, and here's these big salmon. And I went and I walked all around. I couldn't figure out what this was. And I asked at the main desk, and well, this is the College of Fisheries. And I said, "Do you have a library?" "Yes, it's down there." I started spending all my free time in their library, reading volumes of texts and everything, and made the decision.

DB: Was that the Donaldson time –

JJ: Oh, yes. Dr. Donaldson, in fact, gave me a job in the fish hatchery there at the college. I wanted to learn more about fish hatcheries, and that was a good way to do it. It paid $1.25 an hour, couldn't beat it.

TB: Okay, so you also got a master's degrees.

JJ: Yes. I wanted to learn more. I got fairly decent grades. I qualified for graduate school, had over a B average, and higher than that in fisheries. The only thing that darn near sunk me was chemistry. But I didn't know enough, and I wanted to do a study, and I knew what I wanted to do. I wanted to go to a small creek, a little bigger than the one I learned how to fish on, but I wanted to know why the Coho were one place, the cutthroat were in another, and the steelhead were in another. And why, when I looked inside them, they were eating different insects. What was going on?

So, I did a study of partitioning of streams by various wild fish. What they were doing and how they eliminated, as much as possible, this competition that would've injured them in nips or injury, or would have caused starvation if one dominated all the others, and I soon found that domination did occur. Coho was the dominant, steelhead second dominant, and cutthroat third dominant.

I did a food study of availability of food with nets drifting food downstream, and then compared it to the diet of electroshocked fish that I collected in that drift zone to see how the different species were selecting. And I got an idea, I found out that the Fisheries department planted a bunch of Coho, hatchery Coho, and I studied those to compare their behavior to the wild. From that I produced a document which said, these fish are occupying very separate habitats, and blockages or changes to the stream or rip-rap or logging can alter the composition of the fish in the stream, the growth rate, the time they smolt, everything. And it's all – my original master's thesis is in there (referring to materials he had brought) and now Special Collections has the Thesis. But it was applicable, and Loyd Royal, the director of the Salmon Commission, said it was the most practical, usable, master's thesis he'd ever seen.

But anyway, it gave me a full ride. I got a scholarship for room and board, meals, tuition, everything else for a master's degree from Scott Paper Company, who I had worked for during the summers and had asked to be assigned to one of their most polluting sites, because I wanted to understand pollution. They knew they were financing me and everything else. I was one of three they selected to do this work on the Snohomish River.

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This creek that I worked on was a tributary of Jim Creek and flowed into the Pilchuck, which flowed into the Snohomish. So, it was directly in the water system that Scott Paper Company used. And those sons of a guns, they didn't contact me early in the year, and I'd been working at Weyerhaeuser for three weeks on the green chain, earning money, spending money, and they called me up, said they've got that perfect job for me, just report on next Tuesday and they'll clear it with Weyerhaeuser so there's no hard feelings. They put me in one of their boilers, the big, gigantic boiler with slag on every metal surface, and then they gave me a 60-pound sledgehammer, or jackhammer, and my job – and here's some old guys that looked like, oh man, they've been through the mill, and they're looking at this bright, shiny-skinned, college kid, and they like, skepticism. Finally I proved to them that I could work as hard as they did, but oh my god, I was trying to figure out what am I learning about pollution doing this? And it was then I realized that Scott Paper Company had employees that had a sense of humor.

TB: Okay. So do you want to talk a little bit about, then, you were in the military.

JJ: Yes.

TB: Do you want to talk about your first –

JJ: I had two summer jobs before graduating and going into the military. Both of them were with the International Salmon Commission, in the interior of British Columbia. One was for six months, one was for four, during college summers. And one was when I was in graduate school, and one was, like I say, in 1964. And I got a chance to live in a log cabin in the wilds of British Columbia on the Chilko River and learned a lot of the practical fish biology that goes on. Loyd Royal had gotten me the job, as long as I laid out spring quarter, and I started work then. It was fascinating. I stayed beyond, and it was alright to bring a firearm if you knew how to use it and were safe. I carried a double barrel shotgun because I was briefed that there are a lot of grizzly bears along the river at the time the sockeye are in. And so sure enough, I piled, a stupid thing, I piled a big pile of dead sockeye, and I was cutting open their head and getting an inner ear bone out for aging, and counting rings, and also wearing a black raincoat and black hip boots. It was cold, and I threw these fish, pitched them back in an alcove, sort of a big pile. And I went in there and I was kneeling down on them, and looked up and there's a grizzly about 15-feet from me looking at me. My instant thought was, "I look like a black bear and he's going to try and kill me;" and they do, they are in their area. And as he rose up, I brought the shotgun around from behind the sling and fired both barrels of buckshot at the same time from the hip. I used to practice a lot of shooting from the hip with pistols and firearms, and I knew, at 15-feet, you're not going to miss with this, and I got him under the throat and almost decapitated him. He just spewed a fountain of blood going straight up in the air, and he fell forward and just sprayed me down with blood. And I demonstrated how strong and he-manned I was, I turned around and threw up. It was things like that that put reality in life, make you suddenly feel like you're really alive.

And the other summer, he assigned me, Loyd Royal did, to Jim Woods, the Washington State Fisheries pathologist, who was going to go all over, 13,000 miles of travel, and all the tributaries of British Columbia, sockeye salmon, looking at pre-spawning mortality. Something was killing the fish before they had a chance to spawn. We found out it was a bacterium, and it was present in a reservoir of bullheads in the stream year-round. But when stream temperatures went over 55-degrees, which is above the temperature that sockeye normally spawn at, and time their arrival on the spawning grounds, their genetics control when they arrive, and the temperature went above this 55-degrees. And on the Chilko River, and I was there and we were sampling the fish, this *Chondrococcus columnaris*, this particular bacterium, my job was to identify them on slides and all that, was killing the fish within 12 hours. And

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we lost 450,000 spawners, the whole run of that river in 12 hours -- to a bacterium. And we started looking at whether there was an antimycin A, antibiotic, that could be used to pre-treat the stream by dripping it in, that would kill the bacteria before it had infected and got in the gills and eroded the gills and the fish literally suffocated. I was given a job in the fall of working on that at one time.

Anyway, that was the two summers. And then after school, after I got my master's degree, I had the year before signed up with the navy. I got my pilot's license on my own when I was doing a master's degree. I got it at Boeing field. I wanted to fly fighters. So anyway, I had a physical exam and a mental exam. Anybody that wants to fly fighters are presumed to be crazy, and I agreed with them. But they found out I had a pilot's license already, then that is always a concern, do they put money on somebody? I went to Pensacola, Florida and started flight training and succeeded in getting excellent grades and so on and so forth, and transferred to faster and bigger planes. But they had never checked me for right-eye dominant, left-eye dominant, right-hand, and it is so rare that it's not on their schedule. And the only way I could land on the carrier, comfortably, accurately, catch the 3rd wire, was to do this. And my instructors were where the radar intercept officer sits in the back seat on an F-4, he couldn't see me doing this, until he worked his way over and he was watching my face in the mirror, and he caught me doing it. He says, "We're going to have an eye exam." I'd never had the problem at night. I was looking at a ball, and no one could see my eyes, but I had it, and they just said, "You can't continue flying." And it was really a disappointment.

So, I wrote to my Washington DC contact for my position and explained the situation and asked to have – I'd like to work in an operations' department. So, they sent me to a destroyer tender in Los Angeles. And I became, after a year, operations officer, ship's navigator, and legal officer. It was the most fantastic training for administration that you can possibly get. They even stuck me on the bridge as one in charge under all general quarters' situations. I was third in charge for the ship out of a thousand men. And it was absolutely fascinating, and I had a wonderful mentor there too, so things just sort of progressed, almost aiming me, not just for my interests of fisheries, but for administrative roles.

TB: Okay. When you were out of the service then, what were your first jobs?

JJ: I called up – there weren't jobs. This is in 1970. It was impossible to get a job. Most of the graduates of the College of Fisheries were pumping gas at service stations. It was a recession time. And so, I called up to Loyd Royal in British Columbia, and I said, "You got any jobs?" And he said, "Well, no." But he used to be the director of Washington State Fisheries Department before he was tapped to be head of this international organization. He said, "We owe you returning vets work. I don't have a job, but I'll create one for you. You'll be working at the Cultus Lake Research Lab, and I have a project I want you to work on, and I'll describe it to you later, and I want you to write a report on it and give a talk on it at the Fish Culture Conference. I can only do the job for one year, but you've got it." I mean that's the kind of phone conversation you don't get very often in life, and that report in the *Progressive Fish Culturist* is inside there. It's looking at using squawks as a treatment in lakes to kill squawfish, the biggest predator of sockeye juveniles. Cultus Lake was particularly vulnerable, and my job was to set up aquariums at the lab, gather sockeye fry and put them in the aquarium, and test different concentrations of the squawks on them. And we found that it was lethal, not only to the sockeye fry but to other fish, if we kept it at a fixed concentration, which probably would occur because you over treat due to mixing problems. You got to get a certain concentration.

Ernie Brannon, he also used to work at Cultus Lake - he became a professor in Idaho. His dad was the superintendent of the hatchery on the Elwha River for the king salmon, and he was a fish biologist, and he

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was working at the lab. And I was talking in terms of eliminating the squawfish from the lake. He looked at me, he says, "Jim, you're a better fish biologist than talking about eliminating predators. We want predators. We want to control the numbers however, but not eliminate them, and we certainly don't want to kill the fish we're trying to protect from the squawfish that we're trying to kill." It's little one-liners like that, that you get when you work around some of these people that change your whole perspective of everything you do so that later, when somebody talked about a bull trout, or a Dolly Varden, as a nasty predator [and suggested] "Let's put a bounty on it and get rid of it." The echo of Ernie's voice came back, and what I learned and everything else in thirty years since then. It was those kinds of moments why you work with all these diverse people, if you remember it. Then someday, you start writing it, and somebody else gets it from you, and they pick it up. Anyways, that played out big time with the Game Department and the philosophies, and rather ancient philosophies of the people I was working with, which caused us great conflict.

TB: Do you want to talk more about your work as a full-time fish biologist with – starting in June of 1971? Here it says that you worked with the anglers in general and fly-fishing clubs specifically. Do you want to talk about that time or those experiences?

JJ: Let me pull it together.

Yes, I started a dream job as an area fish biologist, lived on Hood Canal, had the whole Olympic Peninsula, all the high lakes, all the sea run cutthroat in salt waters, steelhead in all the rivers. I had one of these almost impossible dream jobs in 1971. The headquarter base was Shelton, but I wouldn't live there. I dealt with logging and the National Park and Forest Service. It was just wonderful, broad, difficult, challenging. I looked around for allies, other biologists. Most of them didn't think the same way I did. Most of them didn't relate to fly fishermen. Most of them didn't relate exclusively to putting a priority on wild fish and a secondary interest in the hatchery fish.

The hatchery fish, as far as I was concerned then and later, were a special fish you reared to put in a lake, a lower lake, that didn't have natural fish spawning in it, that needed supplementing with some other fish, if the average angler was going to catch anything. License sales were fairly low. And in the 1970s, I learned that the bigger the fish, the more likely they were to go fishing. If the lake didn't have any fish in it, they didn't buy a license to go fishing. I couldn't get anybody to buy a license to fish in my bathtub either, for the same reason. I started, instead of planting a quarter of a million fish that were literally 6-inches long, legal minimum size, I would raise at the hatchery, work with the manager in feeding schedules and so forth, and rear jumbo size. When I was on the peninsula it was cutthroat, later when I was in Bellingham it was the rainbow. A quarter million down to 50,000, same amount of food. The fish is a pound in size. We started selling licenses at a 25% increase per year. We made money hand over fist. It was a way to make money. It still is. Give the average fisherman a chance to get out with their children and have fun and learn a little bit, they become an environmentalist or supporters, it's the way to go.

The wild fish on the other hand, be very careful not to allow them, the anglers, to harvest so many that the run starts going downhill. These require studies to find out. You just can't sit on a bridge and watch a couple anglers. You've got to get out, you've got to design a study, you have to fund it. I went after federal funding, got over a million dollars to do steelhead studies. Started directing the Kalama River genetic study, where we put a hatchery mark, a genetic mark in an enzyme, on all the summer run steelhead that came from Skamania, our summer run steelhead stock for the Columbia, and we planted

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them, marked them with an adipose clip, and we put them in the Kalama River. I had a crew I ran, and we looked at the genetics of, is there inbreeding?

Now, I got promoted out of there before I wanted to, but I was able to get Bruce Crawford, who eventually became the assistant director, but a very good biologist, and got him in there, and he continued on the work. And we could go in and electroshock the fry the year after there was spawning by the Skamania stock and wild summer run steelhead, and we could find their progeny, the hybrids. We then looked at them and marked them, and we had a genetic mark on them with the percentage of this one hatchery enzyme in their system. So, when they came back as adults, we could compare the numbers of those with the wild, and say whether there was less survival for the hatchery fish than there was for the wild, and it was only 40% of the wild. So, we knew that we had hybridization going on, and it was bad. And there has to be some way of changing this whole mix so that we didn't harm the wild fish, even if it meant shutting the fisheries down, even if it meant no hatchery fish whatsoever in the system. Or isolate the hatchery fish to one stream, and we did that often. And we started cutting down on fish.
I led a lot of biologists on two trips. This was around the same time as the Stillaguamish sea run cutthroat restrictions were passed in 1980, the year before and the year after. I went to the Yakima River, took all of my research biologists from all over the state. God, they grumped. I said, "I got a special project, we're going to do it." "Well I can't do it," and I says, "You are doing it."

We went over there, and we just dissected that system. We found hybridization between hatchery steelhead and wild. Well, a component of all steelhead, particularly summer runs, will throw a certain percent of their population that doesn't migrate to sea, does residualize, is resident. Some of those resident fish will spawn, and they will produce progeny, some of which go to the ocean. There's a delay of a generation. It's a – the more life histories that you have, the more chance your fish are to survive different environmental conditions, and you just have to measure it, figure out what it is. The Yakima River reports are in there. And the recommendation was, stop planting hatchery rainbow for catch and release in the streams. A federal hatchery over there was planting resident rainbow for the tribes and for our agency. And I said, "You've got to stop it, we're hurting those (wild) fish."

DB: It was during this time that, as a fly fisher, you got involved with fly fishing clubs across the state.

JJ: Yes.

DB: In fact, the NW FFF Council, I have some paper here about a meeting that was held in Seattle in 1977, and you went to that meeting. You would go to club meetings. You went to regional meetings, about all these issues that you were interested in. Was there any connection that you actually were a fly fisher to your going to these, getting the fly fishers involved at that time?

JJ: I went after the fly fishermen – some of my bait fishermen friends will give me hell for this, but I found fly fishermen slightly more intelligent than bait fishers. I mean, they were more challenged. In the fisheries issues, they used their head more. I appreciated their perspectives, and I sought them out all over the state. I could talk their language, and they could trust me because they knew I was a fly fisher too, that I had strong, strong leanings towards conservation, even if it meant closure, no fishery, the agency loses some money. We had people in the agency, particularly during the time of that cutthroat report, they were appalled that I was calling -- I sent out a report on Stillaguamish steelhead, asked everybody to read it, and there was a questionnaire in the front, and everybody sent it back. I sent hundreds of these reports, and I got holy hell from the agency.

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DB: But you got a few people behind you, fly fishers.

JJ: Oh, huge numbers.

DB: And I'd like to mention in here, it mentions the saltwater pens, and Ed Foss, he managed through his company to get those pens –

JJ: Oh yes, yes.

DB: -- for the sea run cutthroat.

JJ: Yes, and I worked with Conrad Mahnken from the National Marine Fisheries Service, who had saltwater pens at Manchester, over near Bremerton, and we would use – the club would, the fly club[2] – they taught me a lot about fly fishing in saltwater for sea run cutthroat. I'd fished rivers, and they taught me about it. We went out, we collected a brood stock, transported them by hatchery tanker down to the saltwater pens, transported them in saltwater, and put them into the pens. Our goal was to keep them in the pens. And all this was discussed with the fly anglers, because they were – I couldn't have done this without them and/or National Marine Fisheries Services or support of Cliff Millenbach and my own agency. But we had a fascinating experience there trying to figure out how to get cutthroat, when they were going to smolt, big enough to withstand the stresses of saltwater, because saltwater, going from a freshwater environment as a smolt does on its way to the ocean to become a bigger fish before it returns to spawn –

DB: They didn't have the estuary transition, then. Is that –

JJ: What we did was move the adults.

DB: Oh.

JJ: Everything we caught out there, it was where I learned there was a new race of cutthroat that has never been described anymore, even since. It's the late entry cutthroat, that is racially controlled to delay its entry later to take advantage of the spawning habitat that the early entry also used, but they separated themselves in time. This special separation or time separation was important, and you needed to fill all the niches, all the little empty spaces. So here we were dealing with the late entry fish because we happened to go try to collect them in December, and I thought I was dealing with immature fish. And I found out, my god, I'm dealing in December. They should have been up the river in August and September and October. Here they're still in saltwater. They're late entry. Why?

Well, they're going into small creeks. And what does that mean? Well, it means that if I take them quickly to the saltwater pens, I can take them right out of the saltwater pen, take their spawn and spawn them right there, and throw the adult back in and have huge survival increase for a brood stock that is not impacting the native of any one river. I'm coming up with eggs in a hatchery that are taken and then reared to smolt size, and instead of dumping them in the creek, I have another pen over there that's ready for the progeny of the ones that are the brood stock, and I put them in the saltwater pen, and I can judge when is the optimum time. We were literally creating, in saltwater, the life history, re-creating of a freshwater stream.

[2] Washington Fly Fishing Club, Seattle.

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The fly fishers helped in the planning. And we tried one release of these juveniles down in the Southern Hood Canal – actually, three releases. And they didn't have a home stream. They didn't know where to go, no home stream at all. So we just dumped them in, because all the streams along Southern and Northern Hood Canal were depleted because of logging, home building, road building, culverts and everything, depleted of sea run cutthroat. Rather than plant a hatchery fish on top of the few remaining wild, we put the wild in the saltwater, a big food factory and let them distribute out and to randomly select a stream so that not all of them went in, and it worked, and they went back in.

If I had stayed in fish management, we probably would have that system in operation today. But I was asked to become and applied for regional manager of the Olympic Peninsula, where I was in charge of wildlife, fish, game wardens, everything, and I just couldn't turn it down. But during that time, Jim Deshazo and Harris, dumped the fish that we had, released them, so we had no more brood stock. And they didn't inform me of it. And I vowed someday, "You aren't going to be working here to do that kind of stuff to a program that had so much about it." And Les Johnson, who wrote in his book on sea run, he covered it in his last edition, but he made a mistake. He said, "The fish, all these fish were released from the Shelton Hatchery into the Skokomish River and none returned, and therefore the project didn't work." He got it totally wrong and he didn't ask. He assumed he knew what was going on. The fact that they didn't return showed that it worked. They just went out into Hood Canal and they just shot-gunned everywhere, and they added wild origin sea run cutthroat to every stream's populations.

I did some electroshocking and did work later when I stole it. As regional manager I'm out electroshocking the stream. The game wardens got a laugh over that one. But there they were, and you could detect a fish that had been in saltwater. The body chemistry, blood chemistry changes, and everything else. We had them all the way from spawners down to the size that we knew were from our original stock, which was Tarboo Bay, at the north end of Hood Canal. That's where we –

DB: During this time, you were also marking fish to try to determine their range, what streams they'd go up and so forth –

JJ: Right.

DB: I think people would be interested in how markings of fish have developed over the years, from rather crude methods to really quite refined methods. Is that right? In terms of, remember those clips we put in the fins and –

JJ: Well, yes, there's – it's some visual way. It started with clipping off the adipose fin –

DB: That was one –

JJ: -- of steelhead. But you couldn't do that when it became the mark of all hatchery fish. Now you couldn't use individualized for the adipose clip. So, the same, if you took off a right ventral or left ventral or pectorals, these fish started swimming screwball. They couldn't compete, and they wouldn't eat. So we started, and there were attempts, to put a clip that we can show or some way. And there's magnetic tagging, where you shoot a magnetic tag that's imprinted with a code that you can tell the river of the fish. But you can't be at the stream and tell anything, and a lot of times, you can't tell that that's the fish has a magnetic tag in it. So what do you do? You kill ten times more fish than you need because you don't know which one is tagged, and you need to get a percentage of the fish.

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Then we went to the genetic mark, and that's literally what we were doing on the Kalama, determining survival of Skamania stock steelhead. We were selectively breeding. We'd take a muscle pluck sample and ship it to the lab at National Marine Fisheries Service. In other words, I would drive it to them. I'd hang around, they'd analyze it, they'd say, "Okay, it looks like this one enzyme is unique to the hatchery fish, and it's not here in the wild samples. So, if you want, you can go to your hatchery, Skamania, and you can selectively breed all of these hatchery fish, don't get any wild in there, and set them apart and mark them in some way if you want to, but probably you don't have to. You'll have an adipose clip no matter what, but you have a genetic mark inside. You take a tissue sample and use it and run it through gel plates, and it pulls out these enzymes, and you can tell, okay, that enzyme is connected with this particular genetic chromosome, and you can tell that fish is a hatchery origin fish. This one though is a wild because it doesn't have that."

But that became expensive, time consuming, and what we found out is that there are certain genes that are lethal. We have them. If you call a gene for cancer, that's a lethal gene, and there are certain diseases that have genetics in there, and we would see these. And what you can select for to be your marker gene to put in all of the hatchery fish can be a lethal gene if you don't run a test. We didn't have the time to run the tests, and I didn't even know there was such a thing. There was some suspicion that we had perhaps selected a lethal gene. I did not believe it. What I came to believe was that hatchery fish, with 40% less survival rate, we then do what, with the hatchery fish? Do we quit putting hatchery fish in the Kalama River? No, if the cause of the 40% was an experimental error in your selection of the gene. Therefore, if you don't select, and just put the normal Skamania stock in, without this lethal gene that you were using for your experiment, you wouldn't have this 40% additional mortality, and we can plant hatchery fish.

It became absolutely amazing, the convolutions and everything that people would go through to say, "You don't have the data, you don't have enough data. You need to run it for more years before we make any major changes in fishing regulations, like the sea run cutthroat or steelhead or whatever." And it was becoming fly fishermen against bait fishermen, biologist in the agency against other biologists that were more catch and kill, whereas the one might be more catch and release. It became something that was difficult. I wanted, regardless of whether a person was a fly fisherman or a bait fisherman, I wanted survival. My whole job was to preserve, protect, and perpetuate every one of the runs.

DB: So, it was during this time in 1977 that you started making these comments that you're making now. You were speaking of wild fish at this meeting that I happened to have attended back all those years. But you said that the game, at that time it was the Game Department, that were two separate agencies, Game and Fisheries. And you said that State Game had become enamored with hatchery fisheries and for the annual opening day circus.

JJ: Well, and that was what it was, but there's nothing wrong with the circus. You got – here's the deal, I tried to explain. You have a state full of citizens that are going to vote on budgets, and they're going to have comments to their legislator, whether the person's a Republican or Democrat, and they're going to-- You've already got State Department of Natural Resources hating you because you shut down some of their logging shows that are causing problems in the creeks. I blackmailed Simpson Timber Company into cleaning up a river. Blackmail is too strong of a word, but I told them, I'm going straight to Sierra Club if you don't get those trees out of there that you plan to leave all winter. It'll kill every fish. They said, "There's no fish there."

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So, I got the Forest Service along, Simpson Timber Company along, game wardens along, biologists along, and we went down to this creek, tributary of the Skokomish River. And holy mackerel, you're 14 feet above the creek and you can't see it, you're on trees. They fell the trees and were going to leave them over winter, all their erosion and everything. They are, "No fish down there." Well, I brought along a stick, and a spool of leader, and a size 8 worm hook, and a little old tobacco pouch that had holes punched in it with a bunch of night-crawlers, and I threaded on a night-crawler and lowered it down, down to the pool, held the stick, pulled out three cutthroat this size. I thought that the Forest Service guy was laughing like crazy, the biologists were laughing, and Simpson Timber Company was absolutely appalled. And I said, "Now, you get in and clean them up. You don't wait until spring and summer." They told me later that it cost them $170,000 more than it would have.
You tell me they don't contact their legislator, who they give campaign donations to, and legislators want to save money. "Well let's join Fish and Wildlife, we don't need an agency dealing with commercial fish, the Department of Fisheries, and one with sport, the Department of Game. Let's just get them together. We can cut half the personnel. We don't have to have as many hatcheries. We can get rid of the hatcheries. We'll get rid of the game fish. Commercial are worth more. Or we'll get more anglers, anything to sell licenses." So that was some of the era that we saw coming ahead, but at the time, this was sort of pre-dating that.

DB: Yes.

JJ: We changed our name – I ignore most of this, because no matter what the agency was called, I always did the same job. It confused a lot of people, what's what? They say, "What's game? Do you control bingo?" No, that means, that's a reference on game animals, hunted animals. We hunt and fish too, as far as that goes. But all it did was, is we got all the non-game birders wanting us to spend more time. So we changed our name to Department of Wildlife, instead of Department of Game. We had non-hunted species, birds, or some animals, and we hired biologists, and we did this and that that were specific to those issues. It was about the time I was getting into administration, and I would meet with the birders and so forth, and they had issues, and I supported their issues, and we got legislature to change rules for our agency so that we could better protect non-game animals.

But we also were in a time of cutback, and it's still going on. I'm appalled at what has happened in the agency now, and it's this merger of Fish and Wildlife, which was separated back in 1933. The counties had control then. Everybody worked for the county, and you had as many counties, you had as many different regulations, and it was no good. Counties ran the hatcheries. So we had this state agency, and it started out with Fish and Game together, but they split it into two agencies because you can't have an agency managing commercial which on the surface appears to have higher economic value, because they sell their fish. We didn't sell ours. But when you look at transportation, licenses, motels, meals, and that for a family, a fish caught on hook and line brings more to the state's economy than a commercial fish does. It was only when we started doing the economics and pulling this stuff out that it became readily apparent that there needs to be two separate agencies. One can't get the majority of the budget and hurt the economics of the state for the resort owners and so on and so forth. So they put us back together again. Okay?

They started asking me to do as a field biologist – by then, after two years as assistant director in Olympia, I really missed working with the animal. I'm a biologist at heart. I love to study the critter and the environment, not paperwork and not be fighting over it. I did two years of it, and I made changes, and figured if they're going to last, they're going to last, if they're not, that's the way it is. I got back in the field and they immediately wanted me to start doing spawner surveys on salmon. I said, "No."

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(Response) "Well, why not?" I said, "It's not in my job description. You get that in a salmon biologist job description. You got lots of them here in Bellingham and Skagit County. Have them do the work. I'm a field biologist." (Response) "Well, are you being insubordinate?" (I said) "Yes!" You know, by that time, I'd been through the wars and the mills, and this was a non-issue. I had a job to do, and a legislative directed assignment, and I did it. There was never any question at that point.

DB: And that was – well go back to the sea runs just for a bit, because there were some important changes made in regulation –

JJ: Huge.

DB: -- at that time, and you made all these discoveries about the sea run population, about their migration, all the things that they went through. And you were very supportive in getting the limits reduced and getting the size increased, and all that, in terms of restoring –

JJ: Yes, it came close to costing me my job for the umpteenth time.

DB: Yes. Do you remember the Aberdeen Commission meeting that I attended?

JJ: How am I ever going to forget the Aberdeen? I wasn't allowed -- here I'd done this study and sent out the questionnaire and assembled the results, and got holy hell from Jack Ayerst, Jim DeShazo, and the director Ralph Larson, for sending that out without their approval. I just told them, "I've never had to get approval for any of my reports in the past, why should I now?" (Response) "Well, this is a big change." "They're all big changes. Who's complaining to you?" "Well, nobody yet." "Well, don't worry about it.'

I went around the state, talked to the clubs, and everything else, and got in the final results, and it was overwhelming. And this dealt with the Stillaguamish River. I wanted to start on one stream. I grew up fishing the Stillaguamish River with my Uncle Paul. I knew what the fishing was like. I have pictures of it. I had fished it as a fly fisher, the North Fork and the South Fork and the main stem, and I knew it like the back of my hand.

I couldn't have been as forceful had it been some stream I'd never been on in southwest Washington, but I knew what was going on here. And the fly fishers, god bless them, they came forward in droves, supporting this reduction from twelve fish to two fish, raising the minimum size. Now I knew I should have gone biologically to fourteen inches to allow every female that was re-entering the Stillaguamish to spawn one time before she could be killed legally, but I set it at ten, because I knew I would have so much revolt and hook and release mortality by bait fishermen that I would have to go totally bait prohibited for the whole Stillaguamish system and allow keeping only a fourteen inch or larger, which there were virtually none of at that time because of overfishing. So, I took what I could, explained it to the people, said, "This will make a change. We will see a huge increase." And Curt Kraemer reported on what happened then. He reported on the changes in the Stillaguamish.

DB: He was interested in the Stilly at the same time, yes.

JJ: Oh, he was – that was his stream for managing at that time.

DB: Yes.

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JJ: But rather than – you got so many players here. What you have is the upper-level administration game department totally opposed; Jack Ayerst and Ralph Larson were afraid of that kind of thing. They were afraid that this interest in fly fishing was going to overwhelm their regulations and everything. I thought it was the most senseless fears of all. Here you've got sportsmen that are willing to come forward and help, and appreciate what you're trying to do for them and for the resources, and you want to alienate them and take somebody that doesn't really care, and doesn't really want to buy your license either. I couldn't get it through to them. I gave the report to Ralph Larson and talked to him personally, the director, and to Ayerst.

At the commission, I was told, "You will not talk today." And I said, "That's interesting. The report's author is not willing. What if the commission asks me to talk?" "You'll claim you're hoarse or something." I told Larson, I looked him straight in the face, and I said, "Looking at who is here today and how many there are, I don't think I need to say a word. And if you're smart, you're going to support this, because if you're not—" He says, "Well, I'll just take the heat for it." He did. When they found he'd made the statement that he'd never read the report, didn't know anything about it, I had just sent it out and kept the results secret, which was a lie, Larry Cassidy and all the commissioners, I had talked to in private beforehand. They knew exactly what was going on, and they fired Ralph Larson. And after about a year or so, I became the assistant director, and I took care of the longstanding issues between Ayerst and myself. He would understand it. But he went to work for the Forest Service.

And I went through, I mean, letters of reprimand and everything else, and my old back hair would stand up on the nape of my neck because I just learned in my life and in the navy and so forth, you don't back up for anything. You don't take guff off of anybody, like I was doing, and you stand up for what you believe in, what's right. And because of the fly clubs, who sent endless letters in after the commission passed these restrictive regulations, and Larry Cassidy said in all his years as a commissioner, he had never seen so many people in support of a restrictive regulation as he saw in the audience with all the, primarily, fly club representatives, from all over the state supporting this. And they passed it, unanimously. And – pardon?

DB: You weren't – that's the meeting you were not allowed, you were told not to speak at.

JJ: Correct.

DB: But you had prompted all of us into how we were to –

JJ: Oh, nobody ever told me I couldn't tell you something, whisper in your ear. I'm not dumb where it comes to politics. I had placed many calls to Larry Cassidy, and personal calls, and I'd gotten together with him, and Liz, and all the other commissioners, and sat down and talked to them, and I explained what was going on.

DB: You were in the audience, weren't you?

JJ: Oh, absolutely.

DB: Yes. Do you remember Ralph Wahl getting up and presenting his testimony on Friday Creek?

JJ: Yes, I do. Oh yes.

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DB: Yes, that was the greatest thing I have ever seen in a commission meeting, I thought.

JJ: I so enjoyed that gentleman. He was a gentleman in all things. I was a bull in a china shop compared to him. And he, elegant in all ways. He owned a big department store in Bellingham and was famous for his fishing books on the Skagit and so forth, and a wonderful photographer. I admired him greatly. And Jack Salstrom when I came back down from Canada about three years ago. We lived up in British Columbia, my wife and I for ten years. Jack said, "Hey, can I come over? I've got something for you." And Jack brought a framed picture with inserts of all of Wahl's flies. And in the center is a picture of him, Ralph Wahl, at his fly-tying vise, and Jack put the whole thing together and gave it to me as a present. I gave him number two of those pictures (Big Bar Rainbow), and he's got it in his entryway now. It's the only way I could think of anywhere near thanking him for what he was doing and had done.

But yes, Ralph Wahl. And, well, all of the anglers that stood up and were willing to let their thoughts be known at such a – it was a real crossroads in the agency, tremendously so. Anyway, within the results, within four years, Curt had done creel census, and the average size returning cutthroat had changed. We were getting cutthroat over twenty inches. The streams were filling up with young fish and everything else. I took electro shockers out and looked at that. It was a success there and virtually everywhere that the regulation applied.

After removing Ayerst, head of fish management, I hired Sam Wright from the Department of Fisheries, who I considered then and now one of the finest biologists in the state. And I gave him one direction, as his boss, as the assistant director of policy for all divisions in the state. I gave him a direction, I want you to take that regulation, expand it to all of Puget Sound and all of the tributaries, and evaluate it, and make sure it works, and you should find good reception for it. And he did.

DB: So, after that, you came up to the northwest, lived in Bellingham.

JJ: Still do.

DB: You got involved with lakes and streams up the north –

JJ: Well, essentially –

DB: I was going to go into Pass Lake because Pass Lake is one of the fly-fishing lakes – is the first fly fishing only lakes in the whole country, the whole state, and you got very involved with that.

JJ: Yes. It was one of my first, when I returned to the field, when I was – my wife was overjoyed that I was going back into a sane job. We both had always loved the Bellingham area. She went to Western, graduated from here. I was familiar with Western from coming up here dating her. But Pass Lake was a unique opportunity because it was so rich, and it had potentials for, as it had demonstrated under every biologist that had put fry in it, and all of your projects in the club (Fidalgo Fly Fishers). It was an opportunity to do something that I wanted to do, and that was work with a couple non-native species, brown trout and Atlantic salmon.

It had the food source to grow them, and it also, when I was doing a look-see at the lake, this is over near Deception Pass, and it had fathead minnows in it. Where the heck did these things came from, I don't know. You'd go over in the early morning and park way back on the access and walk and creep down

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near the shoreline. You'd watch out there in the water with your glasses and see these little fathead minnows, just moving around. And all of a sudden, this big shadow, this big, just went slashing through and water flying, and you just got to see a brown trout. The thing I wanted to do is provide to the anglers, the fly anglers, in their lake, because nobody with bait could fish it, and they considered it their lake, and that's fine, something really unique -- something bigger and stronger than many.

Seeing this bait fish in there told me what it would be. It would be the brown trout, which is non-native to Washington, and the Atlantic salmon, which is really a trout from the east coast of the United States. Its closest relative is the steelhead. And so here, and I had already tried in the high lake in the Olympic mountains a plant of Atlantic salmon that I'd got from National Marine Fisheries Service. And we grew in four years eight-pound Atlantic salmon. They were planted this big. I wanted it in Pass, and they performed well, as did the browns.

I don't know what's going on now, but I do know that at the time if I had any questions, anything that I needed to know, I would only have to ask this gentleman here and his compatriots.

DB: Louis Corbin also became one of your disciples. Remember Louis?

JJ: Oh yes.

DB: You presented this to him. (Commemorative Plaque from Dept. of Fish and Wildlife)

JJ: Yep. 1994.

DB: All the creel census and –

JJ: Oh, he just did so much. I'm glad that's still around. Yes, he was a fine gentleman. Well, you all are, you all were. That was one thing –

Are we getting near the -- We got a half hour more, if needed?

TB: Yes, we got as long as you need to talk. So we can use this sheet.

JJ: Go ahead.

TB: Well, there was Pass Lake, and then of course skipping down to this part, there was also your involvement with the Skagit steelhead or the sea run cutthroat fly fishing regulations that you worked with the Fidalgo club on.

DB: Well, all through this time in working with the fly-fishing clubs, I noticed you wrote down Price Lake, and that was also another example of getting groups involved to change regulations.

JJ: Yes, when I was, just to comment on that, that was the first wild trout only lake in the state, Price Lake, over near Shelton. That didn't mean other lakes weren't filled with wild trout. In fact, that one wasn't a trout, it was a char, it was the eastern brook.

DB: The brook trout, yes.

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JJ: It had great food supply. It was right near Lake Cushman. Very little pressure, so there wasn't a history of using bait.

DB: The access wasn't easy.

JJ: The access was not easy, but I went with my canoe, drug that thing everywhere, and I found the spawning grounds of the eastern brook. I mean, it was an upwelling water in a beach area, through gravel. The upwelling had cleaned the gravel. You could see the white color. And I looked at that, and I looked at the fish, and I looked at the growth rate of the fish, and I looked at the food supplies and the potentials, and thought, my god, if this didn't have spawning fish in it that produced too many young, too many wild fish, for the food of the environment, it would be a fabulous fishery.

So I went in and hauled my – I had a new steelhead research crew. This is back when I was head of research. And I figured, you know, they're sitting around the office too damn much, getting to know each other and reading their books. They're not in school anymore. They need to get out and learn something, and not just about steelhead, because the fish they're going to be researching exists with other species, and they have to know them all. So, I hauled them out there, too much griping and groaning, and anyway, we did a complete survey, and they had never done a complete survey before, of any lake, still water.

I told them, "Okay, now you're going to write a report. You're going to analyze the scales, you analyze the diet, analyze the growth rate, just like you would for steelhead, and I want to see how you do it." So this is transferrable, this practicality. And they did it. I spent a lot of time with them teaching and going over data and so on, and we produced that one report, *Price Lake report*, and it created that first wild trout water.

Well, I had a devil of a time getting that through that agency. "Wild trout, or wild only?" "Yes, believe it or not, we got a lot of creeks and rivers that are wild only." It's like it was a new thought to them. Well it was. We didn't have a lake set aside that way. "Well, why do you want to do it? What are you doing this for? Just let it be like it is." I said, "It can't reach its potential unless I get some money." "And, Well, what are you going to do?" "I'm going to rent a helicopter and have them haul in gravel." "Well wait, there's too much natural reproduction now, why do you want to haul in more gravel and increase the number of fry?" And I'm thinking, god, I missed something here. The gravel is this big around and a five-pound fish won't move it. And the little ones certainly won't be able to spawn where this heavy gravel is, and I'll get a reduction in recruitment, and therefore the fish will grow bigger on their own, but I won't cover it all up. I'll let some spawning occur. And that's what we did, we made it wild trout. And it was responding, it was responding. It takes a long time for the old ones to die out, and they're long lived. I've had eastern brook in high lakes that are seven inches long, fifteen years old.

TB: Wow.

JJ: And the slower and the skinnier an animal is, humans included, the longer they live. They're actually healthier. We call them starving, but they're not, not at all. And so, it took a long time for these to die out and the recruitment of fewer ones coming on to grow, and the food supply to respond to being a lot more abundant. Fish biology is a matter of patience, just like fly fishing is.

And so, it was coming along fine. I was no longer there. I was no longer the regional manager, no longer assistant director. I was up in Bellingham and with a big area. I heard that they had taken that off the list

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of wild fish, a wild fish only lake. They turned it back into a regular lake. And not only that, but the same biologist, who was an alcoholic and had cancer, before he died, he planted all of the Olympic high lakes, that I have two major reports and set out separate management for all of them to maximize the potential of those lakes for growing nice size fish, non-spawners. He went ahead and planted Twin Lakes cutthroat, which is a fish that naturally reproduces. It's the west slope cutthroat, which is native to the west slope of the Rockies but extends across the eastern Washington up into the east side of the Cascades. It is in a lake called Twin Lakes, and the agency long ago established a brood stock collection there and spread these fish all over. And because they are native and adapted, they spawned in virtually every environment they went into, including all of the high lakes that I had managed to get into good shape on the Olympic Peninsula.

This guy put this spawner in them, and the one that grew the eight-pound Atlantic salmon now is full of another stunted cutthroat population. And I had to use rotenone on that and hung my tail out the back end of a helicopter pouring rotenone on the lake to get rid of the stunted eastern brook. And to think of all that wasted, all he undid. And it wasn't just him, but it was the regional biologist who gave approval, and Olympia who gave approval.

I realized even if you change things for a while, you get successions of new employees that don't know much, don't read much, don't look at what's gone on and why. Ask the question why, always ask it. They weren't doing it, and so it sets things back. This is the big reason why I have taken all of my research papers, taken them in to the new head of fish management and asked him to put them on disk and distribute them to all of the fisheries biologists so they can read and it's available to them. I suggested he do the same with all the old-time biologists, because what has been happening is as people retire, they either take their collection with them or they leave copies and they wind up in a storage room, and then wind up in a dumpster. As far as I'm concerned, this is probably happening in every state agency. The state has lost a historic memory in each of these cases. The taxpayers are paying state employees to reinvent the wheel, when what they need is a library where they can reference things.

I was really pleased with, well you can go to the Library of Congress, any report that is ever done on federal funding, a requirement is to send that report to the Library of Congress, and they have them coded, and you, as a contributing agency, can get them for virtually no cost. I did that for everything that across the United States that applied to game fish, every state, and I developed a library when I went to the Region 6 that had over 600 reports in it. It was my personal library. If I had put it in a room, they would have disappeared, and then they would have gone in the trash after somebody had read them. I think the state should require each agency to maintain a library, a reference file. And I took, you've seen them, I had in my home an office, and I had five legal sized file cabinets, five-drawer file cabinets, stuffed with all of the background information on everything I did while in that area, plus the background reports. I left the 600 reports in Aberdeen for the biologist to use. And when I went back to the field, I created another library on these references. I didn't want it lost, so I got it stuck in the storeroom in La Connor for biologists to refer to or Danny here to come down and –

DB: Yes, the story was that you went to a dumpster and got some of this. Is that true?

JJ: Oh yes. Well, I was –

DB: I mean, that stuff on Pass Lake, you actually found it in a trash bin or something.

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JJ: Oh, you wouldn't believe. I've never – I'm surprised somebody, that I had even told somebody. I went everywhere I could, not just the Library of Congress but our own agency, and I went into a room that was called Room 5. It was where everything was stored for five years until they threw it in the dumpster. I found hatchery planting records back into the 1930s, for lakes. But I was specifically searching for high lakes, but I found all the low lakes. I stole everything. I readily admit on tape, I stole records wherever I thought they were in danger of being destroyed or discarded. And I would make copies of all the others, sit in the office and make planting record copies or biological. I found lakes that had been surveyed by nationally recognized biologists, who just happened to work for the Game Department of Washington, their reports from the 1940s and late 1930s on lakes. And this type of information is invaluable, and it was being thrown out, and so I made an effort to get as much as I could.

DB: Unfortunately, that file that you put in La Connor on Pass Lake, that file cabinet is now out in the back shed, and who knows what's next for it. That's the way it –

JJ: Well, there's something you can do and I can do, is complain to Mill Creek that they're not maintaining their official records in a secure way. Because if you let up, people being what they are in general, not all, but what they tend to be is, what they don't use, they don't value. And they have limited space, so they get rid of what they don't use. They don't understand history. Everybody should, along with being a fish biologist, should have a history of civilization course. I took one for a full year at the UW, and it taught me more of human psychology and why wars are lost and why civilizations pass on than anything I would have ever learned in fish biology or psychology.

The agency still doesn't have a library. They still don't know why lakes are managed the way they are after a Ken Williams or a Larry Brown or people like myself leave.

DB: Oh, okay.

JJ: They don't – and you question, I questioned one biologist in the Region 4 office. I said, "You know, all this information's available." "No it's not. Besides that, I wouldn't read it anyway. I want to make my own mark in the world. I want to make a name for myself by what I do, not what somebody else has done." I was just so floored at that type of attitude. And it's, what is this, a game? You know, are we wasting the public's money, fly fishermen, bait fishermen, or anything? Are we getting the most out of our employees? Are we not? Are we hiring people that don't know anything, and then not training them, or giving them reference sources so they can read them and realize what has been done in the past? Does it work or didn't it?

TB: Maybe can we shift gears a little bit here? You've been involved in issues that cover both sides of the US and Canada. Can you talk about the differences in management between Canadian federal, provincial and what you saw from Washington State and the U.S. federal government?

JJ: Well, a lot of my friends, especially when I was president of the international chapter of the American Fish Society, it's American Fish Society but it's international, and the Canadian chapter and ours here in Washington. And I had a chance as – the first year, whoever's going to be president-elect is in charge of the next year's programs. You're getting people, you're picking a topic, and I had one that I had noticed from research in Canada. I'd been involved in research with the Salmon Commission. The standards of research in Canada are higher than they are here. The college work is more difficult. The statistical analysis is more exacting, and they're more comfortable using statistics. Our biologists,

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however, are often more practical and will isolate out, know enough to isolate out the variables that are going to have meaning and not waste time on the others.

Now do they miss anything by doing that? Occasionally, yes. But each, whether you're talking about BC Fish and Wildlife or BC Fisheries, they have a commercial and a sport too, or our two agencies here in the state, you have different ways of doing things. It's not that doing things two different ways is bad, because there's so much to do and there are relationships of an animal to each other and to their environment that must be measured to tell how healthy the environment or the fish or the animals are. We could be talking about elk at the same time. It doesn't mean then that if BC does it one way and Washington does it another, that either are wrong. I have found they have a wonderful natural resource to work with. I've been to over 300 lakes in BC, well over that in Washington. I have, in my career, walked in an eighteen-year period over 2500 miles, most of it without trails, cross country, up rivers, over mountains, and so forth. Two thousand five hundred miles, doing my job. And they do the same. They get out and they look at the resource. They don't sit in offices except in the winter when you can't get out there anyway.

But I found that they are somewhat spoiled because we have one Pass Lake; they have a thousand. We have lakes in Eastern Washington, Chopaka and others, that are fabulous lakes; they have 10,000 of those. I mean, there are so many lakes in British Columbia that it's mindboggling. And most of these have not had warm water fish brought in by people that migrated from the south, Alabama or Georgia or whatever, and brought in their favorite fish and planted it. Everybody likes to have a lake in their backyard with their favorite fish, so people from the south would tend to bring a spiny ray in, which spawns in the wild and is extremely harmful to our native fish. We're seeing that on the Columbia River, as the pike and everything.

As far as I'm concerned, there should be no warm water, non-native fish in the state of Washington. I had been the head of research for about a year and a half, and they decided they were going to start up a warm water program because they had so much political pressure. Guess what the program manager was that was given the job of starting it up? Yes, yes, they knew how to pull my tail. Anyway, as quickly as I could I passed it on to Bill Zook, who was a very fine warm water fish biologist, and he and I discussed a lot about how we were going to try and control this monster. Because we had the fish now, and now there was going to be the attempts to plant them everywhere. And surely enough, they did. It's a major, major problem.

But getting back to the BC, they don't tend to have that because their waters are too cold. But now they've been getting them planted up there, and they are as far up as 300 miles, and they're putting the sockeye salmon in Kamloops Lake at risk. There's a lot of them that are large minnow fish, squawfish-type and so on, that are very predacious on small salmonids, trout and salmon. And so, that's spreading. And once they're in a watershed and naturally reproducing, it's easy to go get a bucket and collect some fish and throw them in another lake. And that's happening all over the lower interior in BC. Prior to this, they haven't had to contend with that. The biologists wanted a trout fishery. All they had to do was plant fry from one of its hatcheries. Now in British Columbia, the natural Kamloops rainbow, a native fish, the origins of that are summer run steelhead that went up the Fraser, the Thompson, and other drainages, got into lake systems, big lake systems, went to the head waters, the creeks flowing in, spawned, and then they got resident fish, or a certain portion of them would residualize in the lake. Others would go to sea as smolt and come back later as adult steelhead. So you had a resident population growing up, and if you crossed those residents in a hatchery, and bring in others from other lakes so you don't get inbreeding, you have enough genetic variation. Those originally summer run steelhead of the Thompson River

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system are now called Kamloops rainbow, a resident fish. They still have a certain portion that like to go to sea.

Now, we have gotten a fair number of our fish from Canada. We have resident and anadromous fish of the same species. We have Kamloops planted in our lakes. We have them naturally reproducing. Up there it was, most of the lakes didn't have much natural reproduction, the smaller ones, under a half square mile. And so, BC Fish and Wildlife every spring would go to the hatcheries, not even count them, just take bucket loads and haul them up to a lake or bring them in a fire bucket into a lake and dump them from that. They were spoiled. There was enough food to produce gorgeous resident rainbow in these lakes. Now they're having to manage the lakes like we've had to manage.

I had a chance to talk to Dave Narver, was head of BC Fish and Wildlife, good friend of mine. I called him up and I gave him a bit of raff to crap over how he was managing my lake. "Your lake? You're not even a Canadian citizen." And we discussed fry planting too early. I said, "You don't need all the fish. You don't need all the trips you got. You're planting into this lake when the zooplankton aren't even blooming. There's no food for the small fish that you're planting. And the birds are on their migration north, and the grebes, the blue herons, the white pelicans, and all of them are in these lakes, and they're just wanting to fatten up, a lot of them on their way to the ocean or California. They're just decimating these fish that you're putting in, that are growing fast, those that survive. Delay your plant until the migrations are through. You'll have more zooplankton. You will have less predation. And your fish will get healthier, fatter quicker." You know what Dave's comment to me was? "What are you trying to be? You're retired. Are you trying for a job for a Fish and Wildlife biologist up here?"

Of course, he was kidding. But he said, "You know, I've never had that recommendation." I said, "Well, there are still things you BC biologists can learn from us fish biologists from the states." And he said, "Likewise." And I certainly agreed with him there.

So, we do things differently. We manage differently. We have this American Fisheries Society, where we get together, and I've included a couple copies of when I was involved and have the committees and the title that we looked at it issues.

For instance, how much research is enough? When do you quit doing research and start applying your results? And agencies that are really nervous Nellies will not do that. They'll keep pumping money in rather than face political consequences of changing management. So we have this joint meeting where we can talk on all the issues, openly and candidly. And so, when you get to that question: How do we do things differently? Little ways. The biology and the critters are different north of the border, south of the border. The climate change.

We lived at Big Bar. God only knows what's happening, and this is one thing I want to get in more than anything else. We lived on a lake that was two-and-a-half miles long. There were twelve retired couples that lived year around like we did. We lived there ten years, got to know them and got to know the lake. In front of us we had 700 feet of frontage. There were summer cabins, but-- We moved there, built our house, moved in in 2002. And in 2005 we started seeing the pine trees going red. I started reviewing literature and I found that the interior temperature had increased in the last 50 years by two degrees centigrade, average temperature.

We soon, within a couple years, started seeing this mountain range across from us that was – we were at 3500 feet elevation. The highest peaks were at 8500, so 5000-foot difference. Twenty-five miles long of

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gorgeous unlogged timber area drained into the lake and the timber turning red, turning bright red, getting redder. Then one summer day at the south end, a smoke tendril went into the air, and that started a forest fire that lasted two years, consumed over 40,000 acres, was way over that within a short time, would move at two miles an hour, throwing hundred-foot trees ahead of it in the explosions of the dead forest. The pine beetles had killed them dead, and the fire just ripped through.

It all started from a campfire, and one unattended careless moment. And it got up just opposite of us, and I sat on the front porch taking this most god-awful picture that ought to scare the hell out of anybody, because that thing, if it had jumped to our side of the mountain range – it was all on the back side. If it had jumped to our side, we only had one way in and one way out. And a forest fire like that robs the oxygen from the air.

We knew the risk of the pine beetle kill, much more than down here, to the environment, to humans. And I had written a 50-page report for distribution in the community for how to save yourself if fire crosses the mountains, what to do, what to have, how to protect your house and your land. Keep the flames away from your house, what you have to do, so on and so forth. A lot of that was done, but when you see the real thing, this monster, you see the outside of these black clouds, and it goes up to 40,000 feet, and it's throwing these red sparklers out one end. Two, three miles away, maybe seven miles, but you know that they're whole trees, and they are marching forward with this type of proliferation. And you can't see the flames, they're inside the cloud. Then all of a sudden out of the leading edge comes these balls that are 3,000 feet high that look – there's no air gap, there's no nothing. They're just a turmoil of flame. It's the leading edge, and they've got these 100-foot-high dead pine trees.

That's happening all over the interior of BC. We were seeing grizzly bears heading south. Normally they weren't at Big Bar. We had lots of different wildlife coming south. And it was – the pine trees have pine cones that have pine seeds. The squirrels and other rodents and birds will feed on the pine seeds. If you lose them, you lose the dominant food of the little rodents, which is the food of the bigger bears and so on and so forth, and then you have these huge massive migrations to the south. Going the wrong way, buddies, and they don't even know it, if you've looked at the Cascades and so forth. The trees that died decompose, and that rich, nutrient water flows into our lake, and it causes algae blooms and toxic conditions, because the algae, say dies off, had been a big bloom before ice up, which happens in the fall, and so the dead material un-decayed is trapped in an environment where oxygen is removed by anaerobic non-oxygen requiring bacteria that breaks down the plant, which causes a low oxygen condition, which kills the fish.

And this is happening to lake after lake. So, they are faced with immediacies that we aren't yet. And they're facing old ones, like the warm water fish. So everything is in a turmoil. Management, what does the management do? How do they do it?

I have flown over the North Cascades, over Glacier Peak, and Chocolate Glacier has receded seven miles. It's a valley scoured, U-shaped. There's no vegetation, it's flowing down. And when that mountain erupts, which it does, it's an active volcano, obviously all this stuff melts very fast. And the Burlington Mall is set right in the middle of Gages Slough, which is the old water course of the Skagit River before the last eruption. So, we've got fires, global warming, volcanos. We've had Mt. Baker shaking and the worry that the Baker Dam and Shannon Dam would collapse if there was a landslide event, like St. Helens.

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We're in a world of change. You can't be afraid of our world. You must glory in it. You'll try and manage the fish and manage families, but we have to face it. The animals we love to pursue, whether it's with flies or worms, are facing a very tenuous future with global warming. The last thing that I had was stream temperatures, that one stream in BC that was five degrees above 55.

Here, I was looking at DNR's logging in this state, and they tend to harvest down to the stream, and they leave scrawny trees and they call them a buffer strip. They leave non-fir trees, and they call them a buffer strip. Its short-lived alder trees. Sunlight comes into the creeks, and the insects that we like to use and the fish like to eat, most of them before they lay the eggs, they hatch out in the stream and they go to a tree, but they fly upstream because they've been displaced downstream by the current. There's this colonization cycle that goes on. And they go into a tree. Well, if there's no tree, what do they do?

Well, they go to an open bush, and there they're vulnerable to predation by birds. We don't get as many insect eggs back in the stream. And the streams start warming up. I calculated 70 degrees Fahrenheit is higher than most streams get if they're going to be shaded. If they go through an open meadow, fine. But if they're logged off and the normal meadows and so forth and roads and culverts, we start seeing 70 degrees. That's when we start getting the killer diseases of our wild fish. And it's here in Washington. When we talk about global warming, we've already got it. We're above 70 degrees in the summer on a lot of streams that I was managing, and I see downstream migration or upstream migration, wherever they can go. If there's a culvert there, they can't go up to the cold water, they go down, the water gets hotter, they die.

And so, we've got global warming. BC's got global warming. We're going to have it much worse than we have now. And I don't care who says what, whether Easterbrook[3] here at Western touts his beliefs that, you know, I certainly don't agree with, and a lot of others don't. So, the future of fishing, the future of seeing things, those are the mountains that burned before they burned (referring to photo). We're in a perilous time, and education would help, but I don't know whether humankind is up to the momentous effort necessary to change its use of energy, which is contributing. But that's all the stuff you learn, and it's far more than we've got time for, because there's side issues and everything else to all of this.

Are there any final questions?

DB: Yes. I would like you to talk about these hundreds of miles, thousands of miles of streams you've walked, all these lakes you've seen. Tell us some about the fly fishing and your experience with your fly rod at some of these places, some of your favorite streams. I know the Stilly was.

JJ: This is the fun part.

DB: I know when you were younger and then older years, the Stilly was your kind of home –

JJ: Oh, it was because of hesitation –

DB: -- you lived nearby. But since then, you've been lots of places, so –

JJ: Well—

[3] Don J. Easterbrook, Professor Emeritus of Geology at Western Washington University. BSc (1958), MSc (1959), PhD (1962) University of Washington.

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DB: Well, yes. They're empty.

JJ: There, you got it.

DB: They're empty.

JJ: I haven't fished in four years.

DB: Come on, Jim!

JJ: I haven't touched a fly rod. I haven't gone on a stream or a lake, nothing.

DB: Is that right?

JJ: But I still love creating flies. And some of these are like the *Montana Bucktail* and so on, but I have in my time in BC. Go ahead and open any of those. I have created – that's the one. That was a joke. I have created flies and patterns that no one else has. And it isn't just in how they look, but it's how you fish them. The lake we were on, Big Bar Lake, had these Bahama-type of shoals, white marl, and oh god, you could watch crystal clear, and I didn't need to scuba dive to go down. I could sit in my canoe and just watch, and five-pound fish would go underneath me, and a three-pounder, and a one pound, and a minnow here and a minnow there, and a loon would go by chasing them. It was marvelous to see this kind of thing. But I'd watch the fish feeding, and you can always watch for that flash of light when they open, and they'll flare their gills, because what they're doing is they're taking in water. And that water doesn't go to the stomach, they pass it out through the gill.

Well, the inside of the gill, on the outside is the filaments that they take oxygen. On the inside there's teeth, its gill arch teeth. When they run, they flare the gill, they flare these across their throat, and the water goes out through the gills, and the insects are caught on the gill arch. And they then back flush and swallow, with a tiny amount of water they get a big number of insects. Okay, all these, if you're looking and you can see them, even if you have to wear glasses like I do, you see them feeding, and you wonder, "What did they just eat? I can't see the food. It may be so tiny, but no, a fish like this has got to have a big chunk of food. What could it be?"

That starts the question. And then you take out a seine and you drag it around a little bit to find out what bugs are in the water. Or you look at them and you paddle over to them on the surface. And that fish there is an exact replica of a fish I caught at Big Bar three years earlier, and I've got seventy color photographs of that fish that matches in every way. That fish had taken a dry caddis, those little brown ones you were looking at in the clear box, that are designed to sit on the surface of the water. The tail and the abdomen part hang down in the water, and the deer hair is spun and I flatten it on the bottom and it sticks out to the side, just like the legs of a merging insect that's coming up. Then an insect that's coming up takes its wings out of its case and holds them vertically to dry in the air, and these have that. So, in silhouette, you're replicating, and you don't move it. I hate the little midges that anglers sit with and stare at it and go blind. I don't like that way of fishing. I use these big caddis flies.

Then I started thinking, dragonflies, damselflies. How do I get them to suspend midway in the water column and just sit there and wait for that five-pound fish to come by? Foam. Those flies have dense black foam, sometimes for their back, most often for their tail. And I thought, okay, that sucker's going

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to float. Now, what color do I use? And those, some leeches and so forth – leeches are prominent up there. How do I suspend these? Because most people either put their fly flat on the bottom or flat on the surface. It's in between where most are eaten, on their perilous migration upwards, and they stop to rest and they hang suspended. I took every fly that I could think of – yes, you've got a damselfly there, and that sucker will float, midway in the water column, if you do the right thing. That's when I started experimenting with fly lines and leaders and material, because leaders are notorious for shining. If you have the sun over there, you don't cast towards it because you've got the sun in your eyes and everything else, and you're bringing your fly, you turn and fish this way, put the sun at your back. The fish is out there. He's looking through your fly, your fly leader, and he's seeing the sun, and the sun goes through the leader, and the leader is concave and convex, and you can magnify the light. And as the fish approaches the tapered leader as it gets tinier and tinier, the ball of light is coming down, and they get about a foot apart and you watch that fish turn away. And fly anglers have always said, "Well, your fly is too big. You've got to use a smaller fly." What do they do? They put on a smaller leader because they've got a smaller fly, the fireball is smaller and less likely to frighten the fish. It wasn't the size of the fly; it was the leader that did it.

I'm thinking all this kind of stuff. I've overcome that. I now cast into the sun. And I go blind but I catch lots of fish doing it. And the – where's that story?

TB: This?

JJ: No, it was at the end. It was typewritten.

TB: Oh, I think you still got it in your pile there. You didn't give it to me. Is it this one?

JJ: No.

TB: Hey, I've got it.

JJ: My wife and I would write for a regional newspaper. That's one of the articles. They asked me to tell them how to catch fish, what to do, what to use, and everything else. I wrote an article that the main feature was the sun and this leader. But there are other things buried in there.

What I found was is this, I use a full sinking line and it sits on the bottom. I use a leader that is fluorocarbon material for four or five feet, tapered down, and then I go to monofilament. The fluorocarbon part of the leader sits on the bottom. It's not as visible as your line. I use white line or clear line. My canoe is white. If you ever scuba dive, go underneath a canoe and look at the bottom of a white canoe. It reflects the bottom of the lake the same as the surface of the water does, and they don't know that there's a boat sitting over them, if you don't stick the paddle in the water or muss or fuss. And a white fly line.

Scientific Angler came out with the Supreme fly line. It was the first fly line I ever got, and it was white, and it did the same thing. It was pretty much invisible, and in high lakes that's invaluable. But I would do this fluorocarbon and then monofilament for-- if the water was twelve feet and I wanted the fly to suspend these at six feet, I would use six feet of monofilament, maybe two diameters reduction, tie it to the fly. The fly floats, the leader's light, it doesn't drag down the fly, and it sits there. And I watch either side of the fly, and it's dependent on me seeing the fish coming. If it's a black fly, I see it easy and so does the fish.

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Black is the most visible, non-color. It's a non-color. It doesn't reflect. In depth, a black fly is easier seen by a fish than a green fly. You'd think the lighter color fly would be, no. Red, what does come at four in the afternoon when the sun's here and say the fish or the fly is down four feet, what color is a red fly? It's black. The wavelength of red disappears and it becomes a non-color and it's black. So start with black, and you get something that fish see and are drawing their attention to it. You don't want to overdo it. You're sitting very still in the canoe, anchored fore and aft, so the canoe doesn't swing, and its still water, and you're after noon, and you've got an area where you can see the fly.
It's crucial you see the fly and the fish approaching. When the fish is about, and this will work in three feet of water at the edge of a lake and you casting from the shore. You don't have to be in a boat. Cast that fly out, maybe into ten feet of water, control your leader length so it's sitting about, you know, halfway down, the fly is, then watch.

Every fish in the high lake is going to go by that point at some time. They circle the high lake. There's not enough food in any one area for them to become territorial. They must cruise to find it. Stand still. Don't go flailing around and scare the hell out them. They see movement like that and they're gone. So you get your line out, it's down. Even if there's a wind, your line doesn't get blown in because it's sitting on the bottom of the lake, and your fly is not on the surface, and you just watch with Polaroid glasses. And when you see one coming, you just take in – you kept your rod tip pointed at the fly line, so there's no loop slack, and you just pull in what little there is, and you just wait. And when that fish gets about fifteen feet away, you do that, once. It only takes once, and he sees it. You'll notice he accelerates, he or she accelerates, and they go driving right through these flies. Where you lose most fish is right then. If you strike out of excitement, you break the leader. It's normally three-pound test that I use, no matter what size of fish I'm fishing for.

And I've had – there's a couple lakes in central British Columbia, way up. Most of the time I fish by myself anyways. It's just sort of a healing period. I hadn't learned this technique, and I was using one of these flies but on the surface. And it used to be when I used to smoke, I'd flip out a cigarette butt, real conservationist me. That was about twelve years ago. Here's this fish easily fifteen to twenty pounds, big Kamloops resident rainbow, cruising the edge of the shoal. I'd put the cigarette out. I have a fly within five feet of it, but also on the surface. He doesn't take my fly; he takes my cigarette. And I – why, why? Because it moved water, just at the right time, and movement is life. He didn't know the other one wasn't a twig. These are presumptions, but I lost another flipped cigarette butt to a fish that day when I tried to replicate it. The big ones were – oh, god, I shouldn't tell you this. I took out my hunting knife and stripped one of my flies down to nothing, and I took a cigarette butt and just clipped off just the lower end and threaded it through and waited until the fish came and flipped the fly out there, and plop went the cigarette butt, and bam went the fish. And I thought that is really stooping too low.

PP: I just read a Nick Lyons story about where he imitated a pellet, fishing in this –

JJ: Oh, a hatchery pellet?

PP: Yes.

JJ: Well, I suppose that hatchery pellets sink, and they've got an interest in because they're cylinder shape and cut off, not straight up and down at each end, but at an angle. They'll do a spinning twist and turning in, they got-- If I could duplicate that in a fly, the movement, but it looks like a real fly, it would be the deadliest thing going.

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DB: Did you and Louis Corbin ever discuss this method you used for the anchoring your boat and your line out? I wrote a story about him for our fly club that's almost the same thing as what you're saying. You remember Louis?

JJ: Oh yes, yes.

DB: It was in his trying to perfect the way he fished, and it was very important to him.

JJ: Oh yes. When I was doing the Kalama River research in the middle of a bright sunny day, we would have a lot of boulders in the Kalama River, and the summer run steelhead and sea run cutthroat would come in behind the boulder, which deflected the current away, so it was easier for them to exist. And they'd drift down near the bottom where the current is less. The current is always stronger the higher you go. The resistance of the bottom gives them a hiding area. They go behind a boulder where there is broken whitewater. You can't even see them, but that's the point. The eagles can't see them, other predators can't see them. They rest, they grab food once in a while. And I was trying to figure out how in the heck. I've seen salmon do this, king salmon, sockeye, every kind of salmon. I've seen chum salmon in the Nooksack do it all the time, and steelhead and cutthroat. How do I get at those guys? Because if I try a crossing line, I hang up on the boulder and lose a fly, where the line goes underneath a crevice in the rock and I break the line off. How do I get at them?

I was up at Ross Lake, which I used to manage, and I go into Ruby Creek and Lightning Creek. The nice thing about being a fish biologist, if I want to find out what's in a creek, I don't have to worry about seasons. I'd go in in closed water time, and I'd just look. And I saw the biggest doggone Dolly Varden, bull trout, I've ever seen in my life in Lightning Creek, and I couldn't-- I was upstream from it, you know, I was drifting back down in the canoe. I shouldn't do this. I know what he is. I know how big he is. He can't give me any information I need. Where's my fly box? So, I get my fly rod set up, which I was using in the lake, and it's perfectly legal for me, in non-season times, to sample fish. It isn't necessarily illegal for me to kill them at all, and I avoid it if I can. But I took this—I was working on development of this technique of letting the suspended fly go, but I was doing it in the stream and I was using a slow sink, full sink, fly line, short leader, six feet, all of it fluorocarbon, which also forms balls of light, so that issue isn't helped by whether it's nylon or fluorocarbon or what it is. Anyway, I put one of my big leeches on, the colored ones that are in that one box, but are heavily floating. And what I was trying to do-- yes. I put it in the water and the line sunk, and I'm upstream and about nine feet over from this boulder that's downstream about fifty feet from me, and that big giant bull trout is hanging just below. I cast this fly straight down the stream from me so it hits the water, and I know that if I move my tip over straight to the side, 90 degrees to the current, it would be directly upstream from the boulder. And I did that with this fly, or one like it.

You can feel it, it feels good when they take it in their mouth. They're not feeling mostly sharp things and so on, and especially with the foam. And you can see the foam on a lot of these. Here's one. This is what I like. You see that tail? That's foam. Even on a leader, the fly rides like this in the water, and when I jerk it, it goes down like this, and then floats back up naturally. If the fish is within five feet, don't jerk it at all, just let him come. They may make a circle around me. They just can't stand it and they'll grab it.

Anyway, back to this big fish in the stream. My doggone fly line wouldn't sink. It was a sinking fly line but the current was too strong. So, I reeled my line in and moved my canoe sideways, and I'm using a

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nine-foot fly rod, and I cast down here and I slowly bring it across, and just before it gets to the whitewater, I put the tip of the rod on the bottom of the stream, and the current going downstream just rolled that line down to the bottom. The fly is back in the water about maybe, my estimate was six to seven feet behind the boulder, so outside the whitewater, below the Dolly Varden bull trout, and about this far off to the side. But I'm holding the line there and I'm doing this and bringing it in, and it's coming up right alongside the bull trout. And he does what I've found all the species that I've done this. He comes out of the bubble area, from below it where it's not too many bubbles. He comes right in behind your fly and just moves up just a tiny amount and inhales it. I've used that in steelhead waters, for instance the Kalama River. Midday when the fish go behind the boulders to get out of the sun, I put that tip on the bottom, just make sure you haven't got it stuck between two boulders or you're going to have a shorter fly rod.

But it's all fishers that I have found, fly fishers and bait fishers, they develop their own ways based on what they see in the environment, a particular environment, and the fish that they're going after, and the behavior. We all become fish biologists, environmentalists at that time. We all develop somewhat different techniques. Sometimes we tell people about them and sometimes we don't.

And I think I had the most fun at BC with flies but not fishing. Every fall and spring, I took a class from the Junior High in Clinton, which was about thirty-five miles away by gravel road. It was our closest town, that's where we went to buy milk and eggs and get our mail. I would contact the teachers, and we'd have a whole class bussed out, and I'd teach that year's Seventh and Eighth graders about the ecology of the lake, the mountain range, where it came from, the lake insects, and the fish. I made up a bunch of long poled aquarium nets, and I had them going around collecting the insects. At first, on the first trip I ever did, it was sort of lukewarm, whether they caught one insect or not. Then I brought this fly box with me, and I said for every insect you get, we'll identify it together and you get to have one of the flies that represents that. Oh my god, they stripped my fly boxes in two hours. I love tying flies, and in the winter, I would tie up about a thousand flies a winter, and it took I think maybe four to five minutes to tie a fly. It doesn't take long. And they would go away back to Clinton School and I'd get the sweetest thank you letters. Boys, girls, they were sopping wet collecting insects. The teachers at first were worried because there'd be one or two of them and a nurse and everything, but I didn't get the students into any situation where they would have trouble. I stayed right there with them and had a life jacket I could've thrown. But they just thoroughly loved it. And it was the best use of flies that I've ever, ever had. They went on and who knows what they're doing today. It doesn't take much to change the course of a person. Sometimes all it takes is standing outside a medical building's office and smelling a fish pond. That's all it takes.

DB: There you go.

TB: I have a couple more questions, because you had wanted to talk about influential books.

JJ: This is the absolute total bible. This book is for Western Washington, Eastern Washington, lakes of Washington, depth contours. The man that did this, they're putting out a new edition of it, and they're just invaluable for fish biologists or anybody that are wanting to get into the mountains and do biological surveys. And you've got two, "My Olympics", one and two, high lake reports.
And any fly you'd like to have, you can have it.

PP: Oh, I'm just –

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JJ: I'm serious.

JJ: This Pilchuck book I found in the Marysville high school library when I was a freshman, and it's dated 1949, so it was after that obviously. It's out of print. It's *Pilchuck, The Life of a Mountain*, and it talks about the 70-some lakes around Mt. Pilchuck. And anything that you couldn't jump across was a lake. I made it a point to go to every one of them before I graduated from high school. I would take buddies of mine. We'd go up on weekends and have our parents drive us. I went into my first high lake before I ever saw this, and I was in Boy Scouts for a year, and I was twelve years old, and I went into Lake 22 up on Mt. Pilchuck, a very favorite lake. I had my mom and dad drive me up, and they arranged that they'd come back and pick me up on Sunday at four in the afternoon. I made a point to be there on time, because I really enjoyed this freedom, at an early age, of exploring. Then when this book came out, I just made a point, every one of them lakes I'm going to see, that I can.

That book covers – it's written a lot by the Verlot Ranger Station Forest Service personnel. There are sections on wildlife, the lakes, the creation of the lakes, the little animals at the lakes, and it made me fall in love with that mountain, which I could see from my bedroom window from Marysville. And I could see from the play school yard at Liberty Elementary School where I went. And I'd be, "Oh, I want to be up on that mountain." That's the thing that brought me into the high lakes.

TB: Is there anything else that we haven't asked you that's really important to your story that we should hear? What haven't we talked about that's really important to hearing your story?

JJ: Nothing.

TB: Are you sure? Do you have another question for him? Okay, we're done.

EXTRA

JJ: Thank you, so much, for all of your patience and everything else. It's been fun, and I'm glad I get a place to share those reports.

I'd say from what's in that box, if a student at Western or a community college read all of those, they would know more than the average starting fish biologist does, with any state agency, of the relative things that they need to know. It would be a starting point, only a starting point. But I got to thinking, I would really like that collection to be here. If you find something you can't use, don't feel bad about it, just give it back. And like I say, UW has been interested.

But I watch the kids that go through the fisheries program, and I know how few jobs there are out there. I know how many of my own classmates never made it into a career. And if they can read that-- One of the things that I did when I was-- They asked me at the department of personnel, would I write an oral exam for them. I like oral exams; you might be able to tell that. But I like them difficult. And so, I did. I interviewed them for jobs, people that had passed those oral exams. They had to know the basics of that book or they couldn't pass it. I didn't want to hire somebody and use all the fisher's dollars to train them, when they should have been trained already. I feel strongly that it's my job to give back, so whether it's speaking to classes, public presentations, or reading, writing in common English, understandable, build it up slowly, and don't assume somebody knows from their background, and you just work on it. I've given

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literally hundreds and hundreds of reports out to sportsmen, and this is why I have, I think, a good reputation with the fly fishers, because I ask for a lot but I give a lot back.

DB: You passed all these reports out to us and we had to read them.

TB: These came to us from Danny. Danny donated these to us.

JJ: Well, I want you to know that they'll go to a good cause if you donate it permanently, but those are all in that. And a lot of other things. I left some of the controversial letters and infighting that can occur in an agency. I didn't feel that had any particular place or education. It would confuse people, not knowing the background, so I left that stuff. That's just mainly management, all the way from, why don't we use echo sounders before opening day and after opening day to determine the total number of fish caught?

All the anglers had said, "Well, this lake is fished out, and we don't go the second weekend." And one of our writing anglers for the *Everett Herald* went out with me, and I've included a lot of newspaper stories, which is putting the tread to the ground so to speak. When you write something and it's carried out, does it show? And I took him out and I showed him with an echo sounder all the fish that were in the lake still and how you identify them. There's a whole report on that type of identification and this simple, relatively simple way of calculating the number of fish for each volume of water, and multiplying it times the total volume. We were finding that 40-70% of the fish that we planted prior to opening day were still there in the lake. And we started really pushing second weekend and third weekend, and a lot of family anglers went out and were amazed. If they made a little slight change, so they weren't using the same bait because salmon eggs stink up a lake real fast. So if they used spinning gear, used a float, and then put a fly on it. You see these fish rising. Just fling it out there and just let it take the slack out of it and let it set and hold onto the rod, you're going to get fish. And we had a greater use of the resource, cost-benefit ratio was higher, and we sold more licenses. A piece of equipment like an echo sounder converted into a scientific instrument is able to enumerate the fish that's in there lake.

PP: I have a question, regarding specifically Toad Lake, but it's more general. I'm just curious, when you're dumping several thousand fish into this lake and x-number of those fish are actually caught by people, x-number are gotten by ospreys and whatnot, it seems to me the winters here aren't harsh enough that a substantial number of those fish should be able to overwinter. Yet, I've been fishing that lake for years, and I very rarely catch fish that are holdovers. I just can't explain that.

JJ: The difference between hatchery and wild. Hatchery is product that is, if it's grown right, it's fairly good size, but it doesn't have the longevity of a wild fish. It can't avoid predators.

PP: It's almost programmed then?

JJ: Yes, well, we have, in Western Washington, a lot of summer and not so much winter kills. The main killer is Diphyllobothrium, a tapeworm. And it is in the food, the eggs of it are in the food that fish eat. And it forms into a tapeworm within the fish and kills it in the wintertime when the stresses are greatest. And because it's killed and dies in death, very few floats to the surface. For every one you see on the surface, a hundred might be dead down below. But Diphyllobothrium is the greatest killer in the lower lakes, and it would-- Bass and perch are pretty immune. They're swimming or prey incubators. I think that down here is the main reason. Up north we get our winter kills because the lake's iced over, and there's still a bloom on, and the oxygen is removed from the water --

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PP: Right, I understand that.

JJ: --and the fish die of lack of oxygen. Here, we have summer kills because of oxygen can be limiting as well with the warmer waters and high temperatures and the thermoclines. The layer below that is cold water that the fish would like, but there's no oxygen down there. So you have summer kills. And those are the reasons.

What you have to look at is your overall cost-benefit. Did the number of fish, whether it's 10% or 20 or 40% or 60% of the planted fish, were they caught? Then you have a good cost-benefit ratio, and you write off the others.
Now what happens to the others? Well, their nutrients break down, make the lake richer for plant life, which in turn provides food for insects, which in time provides food for the next fish. If we didn't have warm water fish, we would do what we did for decades. We would do like BC does. We'd plant these fish at this size, not this size. And in a year, they'd grow up to this size. But we can't do that now because the predators, the bass, the perch, the crappie, and their tapeworms decimate the trout population. We have to raise the fish to the size that doesn't require even a month more in the lake.

PP: So, two other questions if I may.

TB: Yes, we're actually still being recorded.

PP: Oh, okay. I could talk forever about this stuff. So at lake like Pass then, I would assume that it doesn't have the same degree of tapeworm problems then at like Toad would, is that correct? Because you do get a lot of overwintering fish there.

JJ: It's going to depend on the food source of the fish. Some are more likely to have fed on the eggs of tapeworms that are drifting down through the water column from birds. Birds are your big spreader of the tapeworm to the individual lakes. Any lake near saltwater's going have a lot of tapeworms.

TB: Pass Lake should have a lot of tapeworms then.

JJ: Yes, it does.

TB: Yes, okay.

JJ: But if you don't have the fish eating the insect that eats the tapeworm. The more you plant too many fish in the lake, the more the midge pupae, the dragonflies, the leeches are removed. Okay? And they're not in abundant enough to sustain the fish. The fish turn to insects that are small that have eaten the eggs of the tapeworm. It takes a certain amount of ingested eggs. I don't know of a single fish in the low country that I've ever seen that I can't find either a tapeworm or a Diphyllobothrium cyst. It's a cyst. It's not this big round worm in the gut. It's a little cyst, and it can kill because they'll have hundreds of them, especially in the brain, and around the gills they erode the gill arches and so on.

No, Pass Lake is one of those, that's why it's so rare, it's so precious. You can grow large fish, but I still try not to plant, *tried* not to plant, too many really small fry, because then they would be dependent on the same insects that pass the tapeworm.

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PP: Right.

JJ: And we've, I don't know, there's been times when Pass hasn't had any competing spiny rays in it. There are other times that it has. We've rehabilitated a large number of lakes with rotenone in the past. Now it's a no-no. And I don't blame it, but you learn about these toxicants. The more you learn, the less you like to use them. But there's one particular way of using. The state doesn't use it. It's Antimycin A, which I could use in high lakes and detoxify it at the outlet, and you could drink the water downstream, and it naturally detoxifies from sunlight within a month. You can literally replant the lake the next year, if you were killing out a stunted population.

PP: What did they use when they poisoned Chopaka last time? Was that rotenone?

JJ: Poisoned what?

PP: Chopaka.

JJ: Oh, Chopaka?

PP: Yes.

JJ: I'm going to guess it's rotenone.

PP: Okay.

JJ: That's the primary one used in Eastern Washington.

PP: Okay.

DB: It's close to the Canadian lakes, I mean in terms of its biology.

JJ: Yes, oh yes. There's so much sedimentary rock and limestone, and you're going to get highly alkaline water, which is going to be ideal for formation of shells, like the scud or freshwater clams or whatever. And the scud or amphibian or the freshwater shrimp, it's not really a member of the shrimp family, is a dominant food organism for growing big fish in Canada.

PP: Right. Those are amphipods, right?

JJ: Yes. I even tried transplanting them once. I learned more from the lake that I put the, killed the eastern brook, on my tail end out the back door of a helicopter and poured this rotenone on the water at this really high lake over, back of Quilcene, and it had stunted eastern brook horrible. I had gone up there and caught forty fish on a fly, and I found a scud in one, and that's all it took. I started then really seining the shallows, and I would find a scud here, a scud there, none, none, none, and then one over here. And I decided, you know, if I kill these eastern brook with rotenone, even put partially empty bags in the inlet streams, I can kill off those eastern brook late in the fall. The lake will ice up, it'll hold the rotenone water, it won't flow out the outlet, and I'll have decomposition of the eastern brook, and I'll have the scud population go absolutely crazy on me and rebound and reproduce by scavenging on the eastern brook flesh. And to make sure of it, I've got this lake just up above it that has scuds in it that I'll go in and I'll

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haul some down and plant scuds. Well, I went in the next year, a year later. I had over 300 scuds per square foot.

PP: Oh my god.

JJ: I mean, they were everywhere. They had exploded. They had ideal conditions, eastern brook to scavenge on, and the perfect water chemistry, and this is what the Atlantic salmon found two years later. I waited another year, giving the scuds a chance to balance out. And my goodness, the Atlantics just went crazy. It was a sight to see. In fact, I saw one angler trying to commit suicide. I swear to god. I hiked in, sometimes I'd go in by helicopter to these lakes if I had a lot of sampling to do, had echo sounders and life rafts and everything else. But if I was just going in with a fly rod, making a quick trip in, I'd go in for a day, and up to eight miles in, and then Charlene is eight-and-a-half miles. I went up and I came over a ridge, and I sat down and I brought out my binoculars, and I saw a tent over near the inlet area on a big old glacier, no longer there, the field carved by it. I looked and looked, and there I saw. Here's this guy with a rod held up in the air, jumping from rock to rock, and these rocks were as big as this room down to the size of the table, and he was jumping. He was following, and I could see the fish through the binoculars that long, Atlantic salmon cruising under the surface. He'd probably been fighting it for an hour or two. And he got distracted, I can only conclude this. I went down and I was too late to try and rescue him. But he stepped off the end of one of the big rocks. He thought there was another rock there. He went down about twelve feet, and it was the biggest splash you ever saw. And he came right to the surface, just popped up like a cork, reeling, reeling. He was treading water with his legs, and he backed over to the shore. And I thought, he must have been a navy pilot at one time. We had to swim a mile with our clothes on. Anyway, he landed it. And I got down there, and it wasn't quite as big as I thought, but it was about six pounds. And they'd only been in the lake four years.

PP: Oh my gosh.

JJ: And they were just, this one-- He said, "Can I kill it?" I said, "Are you going to eat it?" "Oh yes." "Kill it."

Well, successful management of a lake is, if I put like Charlia Lakes on a schedule for a particular species that won't spawn, and I figure the angling pressure and everything else, I'll try and schedule it for once every five years. And that last year and the year following, the sixth year, when the planted fish are starting to grow, should be minimal numbers of the old fish for predation reasons and so that there's food regenerating in the lake. If anglers don't kill fish, I'm in a world of hurt trying to figure out how to manage these high lakes. If you get somebody like Danny that lets everything go, and you know, it's just horrible. He's got to develop a fish-eating habit.

Thank you, folks.

PP: Oh, thank you.

TB: Thank you. Okay, this is it. Now I am going to shut it off. Okay?

The End

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