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James Thull [00:00:10] Can you tell us a bit about yourself?

Steve Moore [00:00:10] Ok. All right. So. All right. So, my name is Steve Moore. Uh, I was born and raised in western North Carolina, (unintelligible) North Carolina right outside of the park. And basically growing up, I used the North Carolina side of the Park for kind of my backyard playground. Started fly fishing here in the Smokies when I was 15, if I remember correctly. Uh, and just one of the things I just try. Because I love to fish and if somebody introduced me to fly fishing a friend introduced me to fly fishing I just fell in love. And so, uh, you know, uh, fly fish for, up until I went to college, then started majoring in forestry. Changed that majored to biology, because that I didn't want to be a tree farmer basically. And realized through my studies that I really wanted to go into Fisheries and Aquatic Sciences for a career. And was fortunate enough to end up in a graduate student program that allowed me to work on a project dealing with brook trout restoration in the Smokies as a graduate student. And then, uh, became, came out, graduated one day, went to work at the National Park Service the next day. I was working on brook trout restoration and fisheries research and management issues. And, uh, you know, just had a short break where I was in Florida for nearly three years, and then came back then was hired, fortunate enough to be hired back permanent full time. And spent thirty one and half years with permanent, full time fishery management research biologist here in the park, the Smokies. You know, as a career it's just absolutely fantastic career. Uh, you know not only did I get to work on those streams, I got fish those same streams that I was trying to protect. And try and work on right there. So, you know, really a neat was been just a truly blessed life and career, but I don't know what else I can say right there.

Steve Moore [00:02:18] My career was kind of an evolution. I started out as a fisheries technician, uh, working under a, uh, fisheries scientist. I was the guy out in the field getting to do all the fun stuff in the back country and what not. And then when he left I got promoted to fishery biologist, so then I then I kind of had some supervisory roles to go with that. And because as the program grew, we started out looking at things like how well, how successful was our brook trout restoration? What do we need to know about trout populations in order to provide the correct information on which to make sound scientific decisions that would protect and preserve the fisheries for now and ever? I mean a Park Service, Park service policies and mandates are we are to protect and preserve the resource, our resource cultural and natural, for present and future generations. And so you know I wanna make sure that we were doing that and, uh, part of what started and as as basically fisheries management work. We realized we had to have the research and science to go with it. So we could make good sound decisions and in the process my program starting to grow, was like me and my program it was the parks program started to grow and become bigger, where we needed more and more staff, it became real clear that we had an acid rain issue here in the southeast. As well as you know, non-native fish issues that we were trying to deal with. And, and then on top of that, we trying to balance angler needs and angler desires with that, right there. And you know, all of a sudden, I found myself not only with this just the fish work, but all of the fishery all the water quality work to go with it. And we we set up the program. We were looking at monitoring fish populations and water quality at the same location. So we could track those changes through time and look at what acid rain effects were having on these fish populations. Uh, and then we were doing brook trout restoration, you know reintroduction of native threatened, endangered, federally threatened endangered species, trying to get those populations back in there too. Because past actions had eliminated them from our water. And yeah, so when we started putting all this together, yeah, the program continued to

keep continue to expand. And all of a sudden did like wait a minute, I can't do that as a one man show. You know, and we were fortunate enough to have a superintendent at that time that provided us the funds to hire a second full time position. And yeah, then we got some additional funding and we hired another permanent subject to furlough position and we would, we would some years we had eight, nine, ten, twelve seasonal and graduate students working for us. And we'd use graduate students a lot of times, we'd ask specific research questions, that we needed answers to. And some dealt with things like horse issues, horse impacts, sedimentation from horse trailer use on on trout populations. We would look at things like acid rain effects at high elevations and different, different watersheds-- different geology different logging histories to try to understand part why? What was going on there? And we'd ask those basic fisheries management questions like okay, we've got all these regulations and our anglers would want to have special regulations because special regulation works somewhere else. And you know and, and I thought one day, well you know wait a minute, going back and looking at a lot of the records we had from fisheries, management, history in the park. It was very clear to me that we did not, that special regulations here, in the southeast, we're never going to grow bigger fish. What we need to focus on is protecting the habitat and the fisheries, the resources, and you know all the resources that fit into those streams. To make sure we have good, healthy populations of people to come and fish. And, you know, so one of the things we did we set out and we took we reviewed 75 years of history, fishing regulation history and management in the park. And in that analysis, I mean we've, we've, we've showed real quick, hey we've had everything from catch and release regulations to bait regulations to different types of single (unintelligible) fish. And none of those regulations have ever made one bit of difference in far as growing a bigger fish in this park. And then we started looking at okay, why is that? Well, we turn to that we've got real sterile water, slightly acid issues and what not. Lots and numbers of fish but because you're at the southern end of the range they don't live very long. They do not get very big. Yeah. we saw in total angling mortality, 30 or anywhere from 55 to 80 percent in these streams. You know, and, you know, no regulation in the world is gunna grow a bigger fish when you got that kind of high and natural mortality. And and at the same time we did some angler Creel survey and saw that as a general rule between 70 and 80 to 85 percent of our anglers were fishing catch and release. They didn't want to keep the fish. And you know they, you know, the anglers that want to keep fish a lot of didn't catch five fish in a day much less five legal fish. So it's kind of you know, it's kind of like okay, special regs aren't gunna do it so lets you know, then we're back to the science of what's going on with the acid rain. And we started seeing headwater range loss on brook trout streams. That's very scary. And the only thing we could point to was acid deposition. And you know, now with the program today it provided probably some of the most in-depth detail Information ever published and put together on the effects of acid rain on our forests and how that effects water quality and eventually the you know, the fish and aquatic life in those streams. And that is now looks like what I can see, being used to affect national policies that will probably tighten the Clean Air Act a little bit to help us down here in the southeast. And if you have in the southeast it's gunna help us along the entire east coast, if we make some of those changes right there. So, yeah, I mean I think there's a lot of things that we've done over the years providing a lot of detailed information a lot of information science that a lot of people don't have in a lot of other places. Um, you know, and and I, I, I guess I got myself a little bit of hot water at one of our fisheries meetings when I uh, challenged our biologist from the national parks service from across the nation to produce those produce the data that show whether their regulations were truely having an effect or not. Show us things, the total annual mortality, that kind of stuff, get that kind of data so you can actually you know, get something from the entire service that will provide those kind of insights. Yeah and I think that the things that we've done the things we are doing that the continued monitoring

programs that we have going on in the park right now, all of those things are going to help ensure that these populations are protected. They're here for the American public to enjoy in the future. And you know, they can come and fish and have a wonderful time and in a very special place.

Steve Moore [00:10:34] Yeah I don't think that we uh, saw that, yeah, where a president had a direct input into policies so to speak or you know, would provide more funding for things. Uh, if anything what we would see, was that generally under a democratic regime, more money was available in the national park system as a whole. Versus, sometimes a republican regime. Uh, yeah, and then once those budget decisions were made it was up to you know, Secretary of the Interior, uh, right on down to you know the head of the National, Ddirector of the National Park Service, the superintendents was how that money was distributed. Uh, as a general rule; fisheries and and fisheries management I think was somewhat of the stepchild. Uh, people love water and they love to play in the water, but you know, because the fish are out of sight people don't see it. As a lot, as a general rule there, were more the funds directed to wildlife, wildlife management. Vegetation, the things that people can see and feel and touch. You know and, and in part, I think that had a big support group like TU groups and what not. That were really trying to help the park and provide extra funds and what not. Those parks got, a lot of time we had a little bit of extra money coming from those kinds of issues right there. But as a general rule you know, there was nothing practical of the president. Just that I can think of over the years.

Steve Moore [00:12:28] Those thing are the ones, yes that have done that. But, you know, those acts were in place.

James Thull [00:12:35] Yeah I think, under, under Nixon.

Steve Moore [00:12:37] Yeah they been under Nixon, they'd been there for a long time. But you know, without the data that we provided. No superintendent or no director or no regional director was going to take any kind of a step to tackle some of those things. I mean we did tackle them through some of our air air resource problems and what not. But he always came in from a human health standpoint. Never a fishery or aquatic issue was always, hey, people can't hike and be safe because of ozone levels or sulphuric acid in the air and this kind of stuff. So it was more of a human health standpoint than it was when a fisheries and aquatic issues side.

Steve Moore [00:13:23] You know that's a, that's an interesting question. And I think there is that side of it. I think back when Roosevelt started to found the National Parks. And places like Yellowstone where the elk herds and the buffalo herds and what not have been hunted almost to extinction. That you know, when they came up with the enabling legislation said National Parks are to be set aside in their natural state and protected there. So that, you know, people can enjoy them. They didn't want people coming in there and hunting and decimating wildlife populations that could be viewed and seen by a lot of people. They didn't do that with the fish because the fish they felt they could restock real easily, and redo some things right there very easily. And as a result, they uh, you know, fishing was allowed. In a way because they felt that was the only way people could truly enjoy the fisheries was to be able to land 'em. And so that was I think that's the difference right there. They have one that you can view real easily, the other one you had to get in the water and participate with them. And that seemed, from what I could see in the historical archives of a lot of our stuff, that seems to be the reason that they went down there.

James Thull [00:14:52] Yeah I think I think it's a fair approach.

Steve Moore [00:14:54] I think it's a very fair approach. Yeah and yeah. Some people do they don't think it is, they think we should be swimming with the fish. But, you know, a lot of guys that own these really fancy fly rods. What they don't. They don't agree with that right there. Sure. And, uh, and I think we need to let people go out and enjoy that resource as long as we can demonstrate that there is no harm.

James Thull [00:15:12] Sure.

Steve Moore [00:15:21] You know, I thought about that question when I read it. And it's I think it's, to me is the uniqueness of the place, the beauty of the place that's out there. Uh, no two streams are typically the same. And then there's the challenge of being able to catch these wild stream raised fish on an artificial fly that maybe you've tied or you bought you know? And there's just the solitude factor right there. You can, you can walk a little bit away from the road sides, walk in a little bit away and you're there. You know, then it's just you and a buddy or you and God or whatever, right there. But you've got the national beauty, the solitude and the wild fish. And, you know, you, you, you, your kind of pitting your skills against that and the fish. You know, are you good enough? I mean and I don't know a better way to explain it. It's just, but it's just so beautiful so peaceful out there. You know, in the different elevations offer different types of scenery and different types of different species of fish. So it's just a special, special place and special, you know, and it's not just park but it's the national forest areas around here. But I think the thing for me that makes the park so special is that it's all wild fish, there's no stocking.

Steve Moore [00:16:54] Going trout. First off, yes, there is a place for both both in the national park system. Non-native fish are out there because our ancestors for good, bad or ugly reasons. Placed them. Here, in Yellowstone, and a lot of other places. A lot of times they placed them in fish, fishless water. Sometimes they put fish in there above a waterfall that had no fish with the mentality of, "oh God God made mistakes. Therefore, we gotta correct it for him, we'll put fish out there." And the fish survived and thrived. And were in some pretty good size ecosystems. But once you get these things established in big rivers and big systems where you've got ya know, a couple 300 miles of stream like here in Smokies, and a water watershed with no natural barrier or no place that you can actually build a barrier to keep them out. They're there, they're established. Um, you know, when we look, when we looked at here in park, we our approach was, in the Smokies, to first off, we went out and identified and we we surveyed you know, well over a hundred different waterfalls and cascades trying to evaluate what's in that, what's a barrier, what will keep rainbows and brown trout for moving back up upstream? We had stocking records so we knew where a lot of these fish were put. And when we, you know, we, we ended up finally concluding that we can't mathematically say what's a barrier and what's not. Because the fish never read the same book we're taught out of. You know, it's just that simple. They'll go go places we don't think they can go sometimes. So we came up with a way to validate whether waterfalls cascades were barriers or not. And then we sat down and we made a prioritized list of streams that were targeted for restoration. And we, yeah, we predicted that with "hey, if we find something additional in the future we will then, you know, target that also." We took the Park Service policy; it says, you know, if a non-native species is shown to hamper or have a negative effect on a native, you can undertake management and actions up to and including eradication in those in those areas where, you know, they can be restored, feasibly restored. We took that very seriously. And and, you know, I mean, I retired a little over 18 months ago, and I still as a citizen and former employer take that mandate very seriously. I think we need to do that because to me our native fish species are kind of like the heirlooms that our parents and grandparents lived with. They're

part of the history of the place, they're part of our history and we need to do what we can to protect them and try to undo some of the past if we can in certain places. We've very wisely selected at, selected those areas and we made it clear that look, you know, we've got seven hundred and seven hundred fifty seven sixty miles of streams that hold trout in this park. Yeah. You know, we're gonna end up with about one hundred and somewhere around hundred and twenty five to hundred and fifty miles that's pure brook trout. Yeah, and that's, that's what they're naturally plus our restoration efforts. Once that goal has been achieved, the rest is going to be managed for Rainbow and Brown Trout. There's no way, there's no way to feasibly remove, there's no way to keep them out because you have boundary stockings, and that's not only true for the Smokey but that's gonna be true for national parks across the nation. Okay. You know, we basically, and some people say we're protecting those populations with our restrictive regulations of no bait. And single hook artificial. Well, you know, in my mindset and mindset of a lot of other predecessors and current fishery staff too, is that look. You, you don't wanna allow people to bring natural bait in. You don't know what kind of non-native are going to introduce it could have another detrimental impact. So, you know, that doesn't leave you with a lot of management options. I honestly think that we could take the regulations, side regulations off. Of the creels. And never impact those population because I'd say seventy five to eighty percent of the people fish and catch and release. I mean you got that high, you know, fifty five, eighty percent mortality. You're not gonna, your're not gonna have an effect on the population. Sure. They're going to they're going to naturally self regulate and as long as we're doing all we can to protect, you know, and and get the science keep down acid rain issue and do those kind of things right there. I think we're going to be on the safe, safe footing right there.

Steve Moore [00:22:01] You know, I'm kind of like this. I don't know any dedicated fly fisherman today that didn't start off fishing with bait. They all started out fishing with bait. I mean I love to fly fish, I don't bait fish anymore, I just like fishing for wild trout. So, I fly fish. I mean, yeah, that's what, that's what my passion is. All angler groups want that resource there so they can catch fish. Now, sometimes the bait fishermen and spinner fishermen would prefer to fish for hatchery raised fish that have been released in the streams. So they can go there and catch the best fish and take him home. They feel that their their their dollar, license dollars for what not, that they should be allowed to go do that. I don't have a problem with that. We have guys that are told to catch and release, that live a long way from the resource and they don't want anybody to kill the fish though that way when they get here, they've got a much higher and better chance of catching the fish than if they, somebody were harvesting the fish. Most of those guys have, you know, have never understood what a self-sustaining naturally reproducing population really is. These populations are gonna fluctuate the droughts and floods and that's just a fact of life. So, those are to me are the kind of two major differences right there. Is, you know, one wants to protect it extreme protected the other one wants something there to fish for. And the harvest. But they both care about the resource. And need to come to realize that hey, they need to be working together to make sure all these resources are protected. And that we don't have continued habitat fragmentation and degradation.

James Thull [00:24:09] I guess I've always seen it as almost an evolution. Like you say, I'd, I'd starting starting out with bait fishing.

Steve Moore [00:24:15] I think you're exactly right. I think it is kind of an evolution. And a lot of these guys will, you know, they'll start out bait fishing and all of a sudden, oh, I want to change the approach. And some of them go from the bait to the spinner and then to a fly fisherman and they never turn back.

James Thull [00:24:38] I, that's exactly how I did it, and uh.

Steve Moore [00:24:40] And, and, and that's okay.

James Thull [00:24:43] Sure.

Steve Moore [00:24:43] You know. Uh, you know, I'm in the process of teaching my grandchildren to fish right now. We go to the lake, you better believe we got crickets and worms, or minnows in the boat.

James Thull [00:24:54] Sure, yeah.

Steve Moore [00:24:56] Uh, my granddaughter who just turned eleven, is learning to fly cast, learn to cast a fly rod And you know, I'm hoping before the summer over, to have her in a stream and let her try and catch her first trout. And it may be very well that we go to one of the streams that I spearheaded restoration on and let her catch a native brook trout where the stream has been restored. You know, why not? Let her learn.

James Thull [00:25:21] I think that's a real good point too, and I don't have any evidence to back it up, but but my impression is just that too. That oftentimes, and I agree I have absolutely no problem with that, I think it's it's what we all have done for the most part. But, bait fishermen often harvest. More than, their, I know when I was out with a worm I was looking to take fish home. You know? And that was okay.

Steve Moore [00:25:43] Yeah. You know, and I'll be honest with you today. If I wanna, if my wife and I, or my wife and grandchildren and I, want grilled trout for dinner, I have no problem with going to the Smokies, or the park over here, and catching five fish a couple afternoons so we can have grilled trout dinner one night.

James Thull [00:26:01] Sure.

Steve Moore [00:26:01] Now. I will definitely harvest rainbow and Brown Trouts. But, I worked way too long on protecting the, preserving and restoring Brook Trout populations to harvest one of those. I just can't. I just can't bring myself to do that.

James Thull [00:26:15] And that's probably a regional thing, right? If you were out west you'd probably focus more on the Brookies than the cuts I would guess.

Steve Moore [00:26:20] Well, see that's that's that is one of the interesting things. When we, uh, and and you're right, and and circumstance and when we go out in relation the southwest tip of the parks restored their native fish population, we were killing Brook Trout. Here we're saving, and out there we're killing. But, you know, just because of where I'm out here in this region.

James Thull [00:26:40] Sure.

Steve Moore [00:26:40] And the fact that I spent as long as I did working to restore these populations to get them back to where people put fish for them, can fish for them. I cannot bring myself even though I know it's not gonna hurt anything. I just cannot bring myself to kill one.

Steve Moore [00:27:02] I would first and foremost say, start to learn about the streams. Start to learn about the trout. But then secondly, I would make sure that I've got a good mentor. Somebody that has trout fished a long time. Somebody that can teach you some of the ways and show you some things that you need to know and then, you know, become a good student. Watch what you're doing out there. Uh, I know when I first, when I first got into fly fishing and about two or three years into it I started keeping a diary of what days I fished, and what I caught, what I fished with, what I caught fish on, what I didn't catch fish on. Some of what the weather conditions were and water conditions. I tried to keep some of that right there, of course for me, somewhere over time I kind of got out of that habit of doing that. And I got down to the point where, hey, you know, I kind of knew what was going to happen. That's from many years of experience but I would definitely have a good mentor, good fly shop you no notion putting in a good fly shop and you know, do things along that line right there. And, uh, because the mentor I think is key and that's you know, I think that that's that's a place that they, we need, you know, if you don't have a good mentor to teach you, you're going to fumble around a long time.

James Thull [00:28:34] Yeah. Sure. Yeah, I think it's like anything else you might as well take advantage of the knowledge that's out there.

Steve Moore [00:28:42] And there's, and there's some really good books out there to read and what not.

James Thull [00:28:45] Right.

Steve Moore [00:28:45] But I'll tell you, if a guys getting ready to get into fly fishing. I didn't have anybody to teach me. I developed some bad habits. Now you've got a lot of different fly shops that offer that introductory beginner fly casting courses and what not. Go get a fly rod, go to one of their classes and learn. Pay the money and learn how to do the basics and then take that to the stream and start to learn from there.

Steve Moore [00:29:16] I think some, you know, qualities that I look at are folks that, you know, one, we share the same interest. Two, we both appreciate the beauty of the outdoors. Appreciate the sunrises and sunsets, what we see on the streams. We appreciate just each other's company, being there. We share a lot of the same types of interest and thoughts and what not. And there's just a lot of comradery that goes around right there where we're you know, where we're kidding each other and having a good time, that kind of stuff. Yeah. And I mean, and that's that's from the side of where I have, you know, these are long term friends that we've fished together before, or else I've got to know through Trout Unlimited or some other, other areas along that line right there. And we we share that common bond and appreciation of place, okay. One of the things, and this is maybe not necessarily if the you know, long term fishing partner. But, I've taught several young people to fish in my time. Just like I'm working with my granddaughter right now. And when I, they when, when I start with that, they come to me and start asking me the questions, that will you take me? Will you show me some of what you know?

James Thull [00:30:33] Mm hmm.

Steve Moore [00:30:33] They're showing me a passion for the resource out there. That you don't, you now, I look the passion a lot of time for you know, are you passionate about this? Or you want to learn? You really Yeah, so you can learn more about it, so you can help be part of a volunteer group that helps gather data and did, yeah. But not only are you

doing that, but you're out there because you want to help protect this place. But at the same time you only enjoy it.

James Thull [00:30:58] Sure.

Steve Moore [00:31:06] That's a huge question.

James Thull [00:31:07] It is, it is.

Steve Moore [00:31:09] I think first and foremost, Trout Unlimited, and I worked a tremendous amount with TU organizations here in the southeast. The local of chapter of Trout Unlimited has just been huge in what they helped us do here in the park. Um, yeah, those guys locally, regionally, and nationally, have done I think a tremendous job of raising awareness of wild trout issues. Well not just launch at issues, but just how special wild trout are, what we need to do to protect them. You know, how to protect these streams, uh, the last several years they've got a good science team that's helped put together a lot of really, really good information on, and good scientific information that's very defensible on. What we need to do to help acid mine drainage issue and what not. They're, they're big into the, you know, they're helping in this now getting into the air quality related issues that we're dealing with here in the east. Yeah, they're looking at issues out west like, you know, ranching and grazing impacts and what can be done right there to improve land management so that the rancher and the fish both win, and the angler win. Yeah, so it's kind of a win-win for everybody. Uh, yeah, I think that they're putting together that kind of stuff they're raising the awareness. You know, I'll be at I think a little bit limited because this varies tied to fishing circles in a lot of ways. You know, we need to be able to get more and more of this information into city and county councils so that when they start though with issues what not so that so much information can be incorporated on how protect things, you know. That they need they need. They need to be that advocate for helping better development issues as we go down the road I think. And also having to improve know ranching and farming issues that we're protecting the streams, and letting people know just how special they are, and why they're there I think. I think down the road I mean was that one they that this is completed I think it was a status of wild trout cross the nation's study. That right. And that's going. That document I believe is going to be huge and helping focus TU especially down the road of what, you know, where their focus needs to be spent. I think that they've got a huge role to play and you know assisting federal and state Land Management agencies. With native fish restoration issues and the protection of all cold water resources I got stop and take a step back and think, we also got Federation of Fly Fisherman. And Federation of Fly Fisherman, you know they're not just a trout organization.

James Thull [00:34:17] they're everything, correct.

Steve Moore [00:34:20] And the reality is that the threats that face trout, there're probably more threats that face small mouth fisheries and some of his other fisheries that we're really proud of too. Coastal Resources and other I think there's a lot of threats there that people don't really stop and think about about pollution and industrial pollution farm pollution. I mean yet the list is, could go on on and on. So you know I think you know those guys have done a great job of raising awareness right there too about those issues and what we need and what needs to be done there to protect those resources. And I think all together all of them are providing a tremendous amount of information that needs to be transferred onto decision making entities right there. Whether it's local, state level, regional level, or federal level. This information. We need to figure out how to get that information to

the right level of decision makers so that we can make sure that we have worked for protecting these resources for now and forever.

Steve Moore [00:35:35] I think climate change is going to be a big one. They won't even talk to me because I know there is a lot of division out there and in the camps. You know, one camp said oh wait it's happening and one camp says it's not. You know, from a scientific vantage point, when I look at it's like, I think that there's enough evidence to say that there's been some climate change what not. I mean 2014 was the warmest year on record.

James Thull [00:35:57] Yeah.

Steve Moore [00:35:58] Okay. You look at ya know, the number of frost free days and where that frost free zone is. It's migrated north out of Florida now.

James Thull [00:36:06] Does it seem as though there's much of a division in the scientific community on it?

Steve Moore [00:36:11] Um.

James Thull [00:36:11] Because I hear the division, but it seems more political than it is.

Steve Moore [00:36:17] The division is probably more political. There is, I think the division in the science, and you know, in the scientific community as it again goes back to your political lines.

James Thull [00:36:27] Okay.

Steve Moore [00:36:27] And I think some of these guys are definitely. Yeah I mean, let's face it, if you're paid by a big corporation and coming up with data to you know then yeah you're gunna, if they're paying your salary you've kind of hard to say no you're right or wrong, you know? But the other real good science coming out of some of the gova, government or some of the different universities and some scientific areas all point to the fact that there is something going on here. Now, this is not just a North American, United States issue. This is a world wide issue. Uh, and when I sit down I look at what's going on in India, and I stop and think about okay, we had the Olympics in Beijing a few years ago. They shut down all the factories for two weeks prior to the Olympics so the athletes could train and run because of the air pollution was so bad, because they don't have any environmental regulations. But that right there the smog so thick it's you know, you can almost get black lung disease just walking down the streets. And that's sad when we had it right there. You know we we need to be looking at those things I think and okay that's one, fracking you mentioned is, yeah. There there are a lot of issues right there and there and again there's some division in the camps on that right there. Um, I've got a good friend that works for the state of Tennessee that, oh in their mining division, and he says in Tennessee, that they're not seeing a result in bad effects of some of the stuff. I know up north in Pennsylvania or other places they've had some bad results. It may be what happened to the fracking depends on the region you're in kind of fins on what's your up too you know. So there there there's I think you've got we've got to keep that in mind. It's not a one shoe fits all sides right here. So there's that piece of it right there I think that's there. Yeah, we're making good strides on air pollution here in in this especially it is going to help the Eastern United States in the southeast and you know protect forests and protect the streams. So you know we need to continue to collect the types of scientific data that can

inform management. ANd we've got to make real sure, and I say we I mean, here I'm retired and I still say we. But I think we, the people in the working for the agencies in the scientific community need to make sure that the science is solid it's repeatable and cannot be refuted. The next step I think, for all of this is to get it out in a format that the general public can understand and digest. Become a lot of it is not in a format that they can understand. Now that's going to take some special people to take the science and put it in a format that anybody can understand. And yeah, I mean I always found it amazing that some of our folks some of our age and education folks would say that they had they put all of their program together on a 5th to 7th grade level to make sure that everybody could understand it when they came to one of their programs. Okay. How do you take a scientific report dealing with global climate change and condense it down to that? I don't know how you get to that point, okay? But there are people out there that are experts in that I think that can help get us there.

James Thull [00:40:04] Yeah.

Steve Moore [00:40:04] You know. But we've got to get it out and in a format that people actually want to hear about and care about. How do we get people today to walk away from some of their entertainment devices, walk away from some of the things that they're really into you know, and to understand this I don't know, I know I don't know the answer to that right there. But I know that most people, and especially over the 30 years, 31 and a half years I spent up here in this park. Most of our visitors had no clue about what goes on in nature. They're there, they're city people they've never really been in the outdoors. They've never been in the wild and whatnot. And so to try to get them educated as why it is important is key. Yeah and I'm like anybody else, I don't wanna lose my whole house air conditioning.

James Thull [00:41:02] Sure.

Steve Moore [00:41:02] I'm kind of like, I like, you know, creature of comfort also like we all are. But we gotta be able to take our take our creature comforts and balance that with things and protect the nature out here.

James Thull [00:41:14] Sure.

Steve Moore [00:41:15] And I think that's one of the big challenges we're gunna face in the future right here. Is how we do that right there and how we go how we get the masses to care.

James Thull [00:41:22] And I've always thought so much of it is about short term versus long term gain.

Steve Moore [00:41:26] That's exactly right.

James Thull [00:41:28] You know? And it's a lot easier to and I, I do too. But you know, leave your air running on cause that's today. You know?

Steve Moore [00:41:35] Sure. I mean, that's it. I mean, you're you're, you're 90 something degrees and 90 percent humidity. You know, yeah you want to be comfortable.

Steve Moore [00:41:41] Yup.

Steve Moore [00:41:41] You know, and and I truly understand that right there. You know? And so and mean that's that's you know? And yes that's the reason that when I turn this on, it's on a remote censor. It's not on a continual cool.

James Thull [00:41:55] Sure.

Steve Moore [00:41:55] You know, so it kicks down where all the fans are running. And then when the temperature rises at a certain point then it kicks the cool back in. You know, it you know, we try to tried a lot of other things that I think that are trying to conserve energy and conserve water issues and what not. So there's things we need, the thing we can all do, if we would stop and think about it. And the thing I look at, I'll be honest with you. And here's something and this may be totally out of left field but if I remember this information correctly we've fouled up that somewhere between 80 and 90 percent of the potable water resources on planet Earth.

James Thull [00:42:33] It's insane amount, the amount of fresh water that we've soiled.

Steve Moore [00:42:37] Now here's my question. Once we mess up all the potable water resources, what's gunna sustain life on this planet as we know it? Yeah, we don't, you know, if you mess up the water then are your food resources next?

James Thull [00:42:52] Water is life.

Steve Moore [00:42:54] Air, air is next. I mean, you know, and we're gunna, you know, so we need to really stop and think about hey, doing some serious, serious work on these kind of issues I think. And the more we can do with Trout Unlimited and the Federation of Fly Fishermen, as individuals, or universities, or whatever is get this message out to the public. And it's key I believe.

James Thull [00:43:14] Yeah. No I agree. Yeah. I think there's a little things we can all do.

Steve Moore [00:43:18] There are, there are many things, little things we can all do. And everybody says, oh well my little bits not gunna help. Well you're a little bit by itself may not be that critical, but all the little bits added together become critical.

James Thull [00:43:31] You look at the statistics. I had seen something once about the amount of energy we would save if, if and I use one, I use one just because I'm, I built an off grid place. So I use rain catchment for my water all my soil, all my power is solar. But I have an on demand hot water heater. And if everybody had one of those the volume of gas that we would save as a nation an annual basis is staggering.

Steve Moore [00:43:55] Yeah well when we just, we just have hot water heater going, okay. TVA is pushing this one particular type of water heater here it's called a marathon. Tremendously insulated, you know it's not gas but it's electric. But because of the way it's insulated and set up it cuts our, it cut our, our power bill about fifteen bucks a year.

James Thull [00:44:19] Sure.

Steve Moore [00:44:20] I mean month, just because of the way it is insulated and set up. And it's the most of energy efficient they could use for this area.

James Thull [00:44:27] Yeah. And if you look at that on a statewide basis if you cut the amount of power, power that the state used by fifteen percent that's huge. That's huge.

Steve Moore [00:44:37] Exactly. So there's things like that that we all and I understand that there are people that don't have the resources to do something. But you know, if you can that right there and we, we started thinking about that there's a lot we can do.

James Thull [00:44:50] Oh yeah.

Steve Moore [00:44:50] A lot.

Steve Moore [00:44:51] Yeah. So.

Steve Moore [00:45:00] I have, you know, the things that strike me, you know. That as a fisherman and as a biologist, over time, is that we have done more and gained a lot more information on what we need to be doing. And, and the park is a much, much easier in the park because we have such stringent mandates. We have to follow these mandates very, very tight. Outside of the park service on Forest Service lands and some other places you know, they've got multi-use state parks, have multi-use. States have to utilize, you know, they're faced with all sorts of challenges.

James Thull [00:45:52] Sure.

Steve Moore [00:45:52] You know land use, to private ownership, to people buying up tracts of land. you know. And so, yeah they're trying to, they're trying to balance where the fish go, with those kinds of things, and the fact that each, each angler out there that owns thousand dollar fly rod has a friend in the legislature.

James Thull [00:46:11] Sure.

Steve Moore [00:46:11] And then go talk to. Or else, or else on the fish, fish commission. But you know, some of those battles we're not going to win. The things that we have, the things that have done, that have been done, that I think, that help native fish is, one we realized the conditions of our native fish populations. We, you know, those guys have developed the you know, (unintelligible) fish so that they can now put those fish in and they won't reproduce. They won't interbreed. So therefore, you don't have introduced fish moving up in the native fish populations, and therefore, impacting that structure with what they will. So you have, I think that's a huge, you know we're looking at okay, what do we need to do with genetics standpoint? To help make sure that we have genetically pure fish populations through time also. And that we're protecting the right genetics for each area of the United States. Um, you know we've, we've come a long way I think, one of the things that always intrigued me, and I wasn't smart enough when I started out to understand this, but once I maybe got a little experience under my belt I looked back and was thinking, maybe I, were kind were kind of dumb in our early years of fish management because we wanted a one size fits all regulation.

James Thull [00:47:35] Sure.

Steve Moore [00:47:36] So whatever regulation works in Yellowstone, will work in Great Smokey Mountains National Pak. No it will not. We have you know, I mean, they're two totally different regions. And there has been a lot of progress in that area over the years between biologists and I think now anglers, and angler groups to realize that hey, we've

got to manage based on what we've got in our own backyard. Uh, yeah I think some of our biggest failure is to figure out how to get a hold of, you know, expansion into previously undeveloped areas without tightening up regulations to protect those freedom banks and protect those resources. And to make sure that which if and if statewide water quality regulations say they set back at 100 feet, that when somebody goes running to their legislature, you don't get the variance to put your septic tank 25 feet from streamlines.

James Thull [00:48:32] Sure.

Steve Moore [00:48:33] You know, yeah. I mean those are the kind of things that and, and those are, those are, political issues I understand that. But.

James Thull [00:48:40] But it should be based on science.

Steve Moore [00:48:41] It should be based on science. It needs to be based on science and what not. And, and you know, some places kind of ideas.

Steve Moore [00:48:47] I mean, I know in one instance where they, they did as well, had a nice draft stream running through it. Half of the people in there got the variance to put there, put everything real close to the stream bank. And all of a sudden, that sanitation and pollution. And guess what? No more trout. Then they wanna know why there's no more trout. Well, duh. Ya know, I mean here's the point out of them, why? Well it's not my septic tank. Oh no, you're right it's not your septic tank. When you get 35 more up here on this one mile stretch of stream. You're getting nutrient richment which therefore, you, you cut back all the trees that's shading the place. You dove grows in there, you got a seven in the creek. All of it together form eliminating your trash.

James Thull [00:49:26] Sure.

Steve Moore [00:49:26] Yeah. So, I mean, but, but yeah, I know people are trying to work on that but it's hard sometimes for people to understand that politics will trump science.

James Thull [00:49:37] Yeah, yeah. I mean usually does.

Steve Moore [00:49:40] It generally does it. You know and so I hate to say that but it's kind of like, you know?

Steve Moore [00:49:45] Yeah.

Steve Moore [00:49:46] I mean what do you say?

James Thull [00:49:47] Yeah, but I think you know, there's, would've done a lot of good. There's been a lot of good done with people. There, there are certain factions of the population that are definitely more aware but we need to figure out how to do more.

James Thull [00:50:01] Sure.