

**TRANSCRIPT**

**INTERVIEWEE:** Tim Bister

**INTERVIEWER:** David Todd

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**Google Voice** [00:00:00] This call is now being recorded.

**David Todd** [00:00:03] This is David Todd.

**Tim Bister** [00:00:04] Hi, David. This is Tim Bister. Good morning.

**David Todd** [00:00:08] Oh, you're nice to call. Thank you very much.

**Tim Bister** [00:00:10] Yeah. Good, good.

**David Todd** [00:00:12] Well, I wanted to say I'm looking forward to talking to you and. And as you may have heard on the line, there is a note that the call is being recorded. And I thought I should just run through what that means and see if that's okay with you.

**Tim Bister** [00:00:31] Sure.

**David Todd** [00:00:33] So here's the thought: we would plan on recording this interview for research and education work on behalf of a group called the Conservation History Association of Texas, and for a book and a Web site for Texas A&M University Press, and finally, for an archive over at the Briscoe Center for American History at the University of Texas here in Austin. And you would have all equal rights to use the recording as well. That was our thought and I was hoping that might be OK with you.

**Tim Bister** [00:01:04] Sure. So, so the recording will be, there'll be a recording of the interview that's going to be saved and available to people.

**David Todd** [00:01:15] Yeah, yeah, we, we want to preserve this and be able able to transcribe this and keep it as a record for the future.

**Tim Bister** [00:01:22] OK. So it helps me with my, with a conversational tone of answers, and all that.

**David Todd** [00:01:31] Sure. But it's informal. It's not meant to be an interrogation or anything. We just wanted you to know that, you know, what the plans were for using this.

**Tim Bister** [00:01:43] Sure.

**David Todd** [00:01:45] Well, good. Well, then maybe we can jump into this and I will give a little introduction so we have some placekeepers on when and where this is happening.

**David Todd** [00:01:57] It is July 23rd, 2020. My name is David Todd. I'm here for the Conservation History Association of Texas. I'm in Austin and we are conducting a phone interview with Tim Bister, who's a biologist and inland fisheries management district supervisor with Texas Parks and Wildlife. And he is based in Marshall, Texas.

**David Todd** [00:02:21] Today, we'll be focusing on his life and career. And we're going to focus in on some of the work that he's been doing with restoring the American paddlefish in east Texas. So that's that's our goal.

**David Todd** [00:02:38] Usually we start these, these small interviews with a question about your, your personal background and how your interest in wildlife and the outdoors might have begun.

**Tim Bister** [00:02:48] OK. I grew up in Connecticut and I spent a lot of time fishing. We had a little farmer that had a pond not, in our neighborhood, that a lot of kids would go to. So we spent a lot of time fishing with, with other kids in the neighborhood when I was growing up and did a lot of trout fishing in Connecticut, trout streams; did saltwater fishing, too. So I've always had an interest in fish growing up, and had interest in science as well. When I graduated high school, I went in the Marine Corps. I really didn't know what I wanted to do. But after, after being discharged and having several, several different jobs, I thought to myself, I, I really need to do something that's meaningful. So knowing that I liked fish (I kept fish an aquarium), I started asking around and made my way to the University of Connecticut and talked to their fisheries professor. And, and he encouraged me to pursue that as a as a career.

**Tim Bister** [00:04:07] So if I end up getting my undergraduate degree in renewable natural resources from University of Connecticut and then my adviser at that time, he had gotten his Ph.D. at South Dakota State University, and he informed me of an opportunity to to go on for a master's program at South Dakota State. So I took that opportunity, went out there and spent three years in South Dakota. Had a great time. I learned a lot about fisheries management. And when it was time to get a job - now, these, these fisheries biologist jobs, they're not, you can't find one every day walking down the street. Right? So I had to be willing to travel. After several interviews, I landed in Texas.

**David Todd** [00:05:00] And where did you start in Texas?

**Tim Bister** [00:05:03] My first job was as an assistant district biologist in Tyler. I worked there for five years before getting this district leader job in Marshall.

**David Todd** [00:05:17] I have missed that, the location. The signal dropped out for just a moment there. Your first job was where?

**Tim Bister** [00:05:24] My first job was assistant fisheries biologist in Tyler, Texas.

**David Todd** [00:05:33] OK.

**Tim Bister** [00:05:35] And after five years there, I got this position as a district leader in Marshall. I've been with Texas Parks Wildlife for 20 years now.

**David Todd** [00:05:47] I'm sure you've seen a lot. Well, and I guess one of the focuses of what we'd like to talk about is, is this experience you've had over a number of years with the

paddlefish. And, you know, many people who might hear this interview perhaps aren't familiar with paddlefish. And I was wondering if you could just give a brief introduction to its characteristics, life, its habitat and maybe its evolutionary history, which seems very, very long indeed.

**Tim Bister** [00:06:29] Sure. So the paddlefish is very interesting, it's one of the oldest species that we have in the fossil record. I think there's records that have dated back to about 300 million years ago and there has not been a lot of change in the, in the paddlefish as a species over that time. Recently, there are only two species of paddlefish in the world - the American paddlefish and the Chinese paddlefish. Unfortunately, several years ago, the Chinese paddlefish was determined to be pretty well extinct through overfishing and dam construction on rivers there. So it's believed the American paddlefish is the last remaining paddlefish species in the world. It's a generally, a big-river fish. There's thriving populations in the Mississippi River and Missouri River and other areas of the country. But so it relies on those types of habitat, river habitat with good water flow throughout the year, certain times a year, especially during their spawning season in the spring. They, they can live up to about 50 years old and they grow to about six feet long and they can weigh up to 200 pounds.

**Tim Bister** [00:08:15] They, it's interesting, their, the rostrum or the, the paddle on the front of the fish, it's actually, it has a lot of electro-receptors on it and it's thought that they use those receptors to identify where prey sources are, and what they eat - they actually filter out zooplankton from the water, much like a much like a a whale that swims through the water and and filters out krill in the ocean. And that's what these paddlefish are doing with these small microscopic animals, the zooplankton that they eat.

**David Todd** [00:08:58] I'm just writing down what you're saying. This is so interesting. So unlike many fish that might be eating plants or eating other fish, these paddlefish going after these, these very small zooplankton, as you mentioned. Can you give an example of what would what would be, this kind of plankton, very small prey base that they work on.

**Tim Bister** [00:09:27] Oh, there's lots of different types of zooplankton. And some even, even though they're, they're microscopic, they're, you know, some are bigger than others. And I think the paddlefish have, have preferred and they may actually be able to identify where more preferred zooplankton are than, than others.

**David Todd** [00:09:56] That's interesting, not just identifying that there's some kind out there, but particular kind of zooplankton.

**Tim Bister** [00:10:03] It is amazing to me that these fish can get as big as they are by eating just a little small zooplankton.

**David Todd** [00:10:16] Indeed. Well, it's intriguing to me that, you know, such a ancient species that, you know, has been around for 300 million years, as you said, and one that's thriving in the Mississippi and Missouri, has had troubles in a number of Texas rivers and streams. And I was hoping that you might be able to explain what might be behind the paddlefish's decline in Texas over the past century or so.

**Tim Bister** [00:10:49] Sure. So rivers in Texas historically have been, I think, the edge of the paddlefish's range throughout the country. And I think a lot of times when you see certain species have issues with being able to maintain themselves in certain areas, usually on the edge of their historic range, where, where some of these issues happen.

**Tim Bister** [00:11:19] But the paddlefish also has to deal with the fact that there was a pretty large commercial fishery for them, not only for their, for their meat, but also for their eggs. Paddlefish eggs make a pretty good caviar. So in the early 1900s there's records of quite substantial commercial landings in Texas for paddlefish, which, which may probably have had something to do with the decline in numbers, but probably the bigger issue has been the construction of dams that create reservoirs in the, in the state on some of these rivers.

**David Todd** [00:12:11] And what is it about, it just seems clear that overfishing and particularly taking roe, might really hamper the population. But what would it be about the dams and reservoirs that interfere with the paddlefish's success?

**Tim Bister** [00:12:29] Sure. So when a dam is constructed on a river, for one, it prevents the ability for a fish like the paddlefish who will swim a long way in a river and prevents them from being able to move upstream in the river.

**Tim Bister** [00:12:50] But the other thing it does, it alters the river flow downstream of that reservoir. Many times the river flow is reduced to the point where the river can't operate as it would naturally. In a unimpounded river, you have seasonal higher flow periods. The faster water is flowing through a river channel, the more sediment that it will carry downstream, which helps to keep the areas of gravel clear in the river bed and gravel is one of the preferred substrates for paddlefish to spawn on. When, when paddlefish spawn, eggs are fertilized, they will adhere to pretty much the first thing they come in contact with, and that's usually gravel, is what that is. So if you have slower-moving water because a dam upstream has created that situation, sediment will settle in on gravel and, and cover up those gravel beds so you don't have the preferred, required spawning habitat that paddlefish need.

**Tim Bister** [00:14:18] The other thing that happens is, if, if the dam has created a situation where it's more of a constant release, a lower release of water downstream, you don't have spring, generally spring, pulses in higher water flows that that come in and cue fish like the paddlefish that it's time to spawn. So paddlefish are interesting in that, you know, they're a long-lived species and generally to be able to maintain their population, they don't have to spawn every year. But if you have situations in a river where spawning is disrupted because you don't have natural flow cues or if you don't have a preferred, required spawning habitat, well, then if it happened on a year that the paddlefish would spawn, well, then you miss that opportunity and then numbers will continue to decline.

**David Todd** [00:15:25] That's fascinating. So it's, it's a, it's a hint, it's a clue, it's a cue for paddlefish to say this is the season that's the most propitious to breed. And if they don't get those high flows, those rapid flows, and they, you know, they may just pass up that opportunity and another year cycle might go by. Is that what you're telling me?

**Tim Bister** [00:15:53] Yeah, that's, that's correct. You need you need that higher flow, combined with the amount of daylight at that time of year, and, and temperatures also. So the way that dams change the natural ecology of a river flow downstream can be very disruptive to paddlefish and other species that use the river.

**David Todd** [00:16:22] That's really interesting. So I was talking to, to one of your colleagues over at Fish and Wildlife Service, Mike Montagne, and he said that another factor that they found is that, and it's his understanding was that when dams were erected, when there's less flood flow downstream, and so, so some of these oxbow and other kind of bottomland water

bodies don't get filled up. And so there aren't these protected nursery habitats. Is that, is that something you've seen as well?

**Tim Bister** [00:17:07] Exactly. That's, that's what'll happen. Take, you know, consider the paddlefish. If, once, once the eggs adhere to the gravel, and after several days when, when the, when the fry hatch from the eggs, they, they need water to help them flow downstream, and generally what they do is, they go into these kind of backwater areas where food is abundant for them to be able to grow up and then back out into the river when they're, when they're large enough. And if you don't have these higher flows that are connecting these backwater areas, these oxbows, you're missing that, that component of habitat that these fish need.

**David Todd** [00:18:02] Interesting. The erection of these dams can affect the spawning stage, as well as that early nursery stage as these fish are growing up and I guess they're they're looking for food and they're also worried about predators - and they need that protected nursery area?

**Tim Bister** [00:18:25] Right. It's, there's all there, all the required components really need to be in place for, for a species like paddlefish to be able to successfully reproduce and continue their numbers.

**David Todd** [00:18:41] I see. Well, how can you perhaps give us an example of how this this, you know, the biology of the fish and the construction of dams might have played out in Texas. I know there's been some dams built on the Sulphur, and on tributaries of Caddo Lake and other, I guess, Neches, where some of these declines have seen in the years following the dams. Can you maybe fill in the picture there?

**Tim Bister** [00:19:14] So reading some literature, there's, there's evidence that there were paddlefish populations in, in Big Cypress Bayou and in the Sulphur River. Sulphur River is where Lake Wright Patman was built. And Big Cypress is where, Lake O' the Pines was built. That's one of the first reservoir upstream of Caddo Lake. So what happens when the reservoirs were built? Not only do they prevent the migration ability of fish and disrupt natural flow downstream, they also inundate areas in the reservoir footprint and upstream as well. So any, any paddlefish that would have been upstream of these dams would lose the habitat up there. And I think over time they're just not able to reproduce and maintain their population. So I think you have that happening on both sides of the dam, upstream and downstream.

**David Todd** [00:20:20] Oh, so there's slack water, I guess, upstream of the dam that doesn't have those pulses and that low sediment that you would need?

**Tim Bister** [00:20:32] I think that's right. I think when you have, so some rivers like the Big Cypress, it's, it's not a big river. And we look also in Texas at the, say, the Sabine River, it's a longer river. Toledo Bend is the largest reservoir on it. But then there's a long distance between the upper end of Toledo Bend, all the way up to Lake Tawakoni area. Hundreds of river miles. And I think we actually still see paddlefish there and that may be from some efforts that were made back in the 90s to try and reintroduce them there. That's where, that's where you find success was where you have enough river flow and still enough spawning habitat. Areas that are smaller rivers, like Big Cypress, it's harder to, it's harder to support a population that has these requirements.

**David Todd** [00:21:38] I see, so you need a certain number of river miles of free-flowing water and these smaller stream like the Big Cypress just aren't long enough to support that.

**Tim Bister** [00:21:50] I think given, if there's no intentional influence, it's harder to make that happen.

**David Todd** [00:22:05] I see. Well, you mentioned that on the Sabine that they're starting to see some paddlefish there that may be connected with introductions that were done back in the 1990s and maybe this could be a good segue to start talking about these, you know, when paddlefish were starting to be identified as rare and then, you know, work was starting to try to recover them. Can you tell me a little bit about this, this effort to restore them?

**Tim Bister** [00:22:35] Sure. Well, paddlefish were identified as a, as a threatened species in Texas and protected in 1977. So it's been, it's been a good long time that this has been an identified issue for the paddlefish. In the late '80s and in 1990s, there were efforts in several rivers to restock fish and look for preferred habitat and then follow up, and in some of some of those areas to see if there was any success. Unfortunately, what was found, well, for one, the fish that were available to stock, were really smaller than what was recommended to be able to avoid predation. So that, that was one thing against those projects is a lot of fish were probably lost to predation.

**Tim Bister** [00:23:37] Another thing that was found, though, they tracked some fish, may have been in the in the Angelina River, and found that about half of the fish probably lost either due to mortality or actually going downstream through the dam. So that that leads to some concern where if you're trying to restore a population upstream of the dam and you, you lose a lot of fish downstream. Yeah, you'll maintain some numbers downstream of the dam, but the effort that it takes to try and maintain a population upstream or restore a population upstream may not be worth the effort.

**David Todd** [00:24:31] I see. And so how did Parks and Wildlife and its partners understand that these were problems and try to correct them?

**Tim Bister** [00:24:45] I think the one of the biggest, biggest challenges of paddlefish restoration that was identified in some of those early studies is that if you don't have the right spawning habitat, it doesn't matter how many fish you put in if they're not able to reproduce and self-sustain, your efforts for restocking just won't have a long-term effect. So that's one issue.

**Tim Bister** [00:25:17] And then the flows issue is the other, the other component of it. Knowing how dams can disrupt downstream flows, there has to be something in place so they will have more natural flows. Now reservoirs like Lake o' the Pines, they've, they've done their job of what they were constructed to do to keep, a flood control reservoir like that, keeps the town of Jefferson from being flooded like it was back in the early 1900s. And also serves as a water supply for municipal and industrial uses and provides a great place for recreation. But without intentional, an intentional plan of what happens downstream of the dam, that creates a challenge for the paddlefish. But luckily, 10 or 15 years ago, things were put in place to start looking at that.

**David Todd** [00:26:27] Yes, well please tell me about that. How did you all figure out what flows were needed and then secure the flows and, and I guess the the shoals that might support a viable paddlefish population?

**Tim Bister** [00:26:45] Sure, so understanding that these environmental flows were needed, there are so many different agencies and non-profits, partner groups, work together on this issue of, you know, what, what do we need for flows? And what do we need for flows downstream of Lake o' the Pines during different types of years? So over the course of several years and discussions and studies, they came up with building blocks of these would be the recommended flows to release from Lake o' the Pines during wet, moderate or dry years, and at different times during, during each of those years, to, to mimic what the natural river flow would be if Lake o' the Pines wasn't there.

**Tim Bister** [00:27:42] One issue is the amount of water that can be released from Lake o' the Pines is limited to 3000 cubic feet per second, which is much, much lower than some of the historical high flows. If we could get those flows as high as they used to be (well, again, City Jefferson would be probably flooded during those things), but considering what we had to work with, those building blocks were developed and agreements with the United States Army Corps of Engineers that operates the dam at Lake o' the Pines, and the Northeast Texas Municipal Water District, came up with a plan to have these environmental flows released from Lake o' the Pines, and, and try and have a natural, as much as possible, river ecosystem between Lake o' the Pines and Caddo Lake.

**David Todd** [00:28:51] Well, I think as somebody who is a biologist and is interested and cares about fish, I can see why you might support a change like that, but I imagine that the Corps and the water district, this isn't their highest priority. How were they brought to the table?

**Tim Bister** [00:29:14] They really have been great partners in this, with the understanding that the primary, primary need for the reservoir is flood control. So if, if the reservoir needed to operate in a certain way to prevent flooding downstream, to release waters at certain times or to hold water back when they needed to, that's, that's how they're going to operate. But the environmental flows, that, it's, it's really worked out very well.

**Tim Bister** [00:29:51] And once, once these flows meetings were going for several years, there was also a plan to start looking at habitat, and the Corps of Engineers actually helped fund a habitat project where several areas of gravel were installed in Big Cypress, above Jefferson, upstream of Jefferson, as potential future spawning habitat for paddlefish.

**Tim Bister** [00:30:28] So the biggest thing that we tried to do with all these partners, leading up into the paddlefish project, is to make sure that we had a plan for environmental flows, natural flows, and to have some, some areas of preferred habitat for spawning in place before the fish even went in.

**David Todd** [00:30:54] That's, that's a prerequisite, really, to having a paddlefish that just isn't stocked year-in and year-out. You want a reproducing population, I guess.

**Tim Bister** [00:31:04] That's the goal.

**David Todd** [00:31:11] Well, can you sort of walk us through how, how one of these restocking efforts works. I mean you explained some of the work on the flows and on rebuilding these shoals, but I guess the other, one of the other key steps is actually getting these fingerlings, or large fish, from hatchery and then bring them to the bayou, and doing a release, and monitoring them, and so on. Can you tell us a little about that.

**Tim Bister** [00:31:42] Sure, sure. Well, the first concern, based on previous work, so when Parks and Wildlife says, you know, if you put paddlefish in, you're going to lose a lot of them downstream. So that was that was our concern with this project. You know, we try and restore paddlefish to Caddo Lake and Big Cypress Bayou. Are, are we going to just lose fish over the Caddo Lake spillway, down into a 12-Mile Bayou and off into, you know, the Red River and our efforts would, we wouldn't have any, any positive results from our efforts.

**Tim Bister** [00:32:23] So, so the first thing we did was, we stocked 47 fish that were implanted with radio transmitters that we could track and, and see where they, they moved over the course of about a year. Working with the Fish and Wildlife Service, who installed three different antenna receivers, the most important one, I think, being down at the Caddo Lake spillway, to be able identify, did we see one of these fish go by that, that antenna receiver and probably downstream?

**Tim Bister** [00:33:10] In addition to those stationary receivers, we were able to go out and actively track fish in a boat with a, with an antenna to try and locate where they were. So that, that first year actually ended up being successful. It was determined that we did not see any fish go downstream over, over the spillway.

**Tim Bister** [00:33:40] So then that led us into kind of the next phase. Well, so if fish are going to stay here, well, then it's going to be worth it to stock more fish and try and build up some numbers. So then we, we stocked another round of fish with some more transmitters and actually stocked them in Caddo Lake itself. Think of one thing in that early, early part, it was determined that so we stocked a lot of fish either at Caddo Lake State Park or upstream in Jefferson, and most of the fish ended up going upstream. And very few went downstream into Caddo Lake itself. But Caddo Lake actually had a better food source, better zooplankton source for fish. So we said, well, so what if we stock fish in in Caddo, where there's better food source and where they may stay longer and actually be closer to going over the spillway? Well, after that, still no fish or maybe just a couple of were detected down near the spillway, but we were still confident that stocking fish in the system - they would stay in the system.

**Tim Bister** [00:34:53] So then Parks and Wildlife and Fish and Wildlife Service worked together, and we've developed a 10-year restocking plan to try and build up numbers in the population to be able to have sufficient numbers that can reproduce and self-sustain.

**David Todd** [00:35:14] And I guess part of the reason you could look out so far and then plan on stocking so many fish is that the hatchery up in Oklahoma had already sort of filled out its quota for restocking in those rivers north of Caddo?

**Tim Bister** [00:35:35] And that's, that's what Fish and Wildlife Service had told me, that the fish are being raised at Tishomingo National Fish Hatchery in Tishomingo, Oklahoma. And for years, I guess they were providing fish for, for Oklahoma and some of their areas. But the timing was, was right to where Oklahoma wasn't going to request any fish for a while, so. So Tishomingo has really been focusing on this project to be able to provide the fish that we need.

**David Todd** [00:36:16] That's great. And I think earlier you said that in the work in the 90s found that the fish that were being released were too small and they were just yummy prey. And so are these new fish that you are releasing larger, better able to escape predators?



**Tim Bister** [00:36:37] They are. I think for the most part, we're trying to meet that size requirement, the best we can out of the hatchery. Some, sometimes hatcheries have issues where they, they need to get fish out of the hatchery into where they're going. And we get some fish that were a little bit smaller than that. But other fish have actually been larger than that preferred size or preferred minimum size. So I think in all we are, we're meeting that requirement. And with, with some of the fish that we're seeing after the fact and some of our efforts to recapture some fish and seeing their survival and, and their growth, I think survival's work and just, just fine.

**Tim Bister** [00:37:26] So you talk a little bit about how these releases are done. How do you recapture a fish in such a big body of water as Caddo and Big Cypress?

**Tim Bister** [00:37:39] Sure. Well, one thing that's actually made it, I wouldn't say it's easy, but easier, is being able to track these fish. We know that many of them have swam upstream to just below Lake o' the Pines, in their spillway area, and they seem to be attracted to the flow. There may be a, a better zooplankton food source concentrated in that area because of the nutrient-rich waters from the reservoir coming through the dam. So we know that there's a lot of fish there.

**Tim Bister** [00:38:16] One thing that, there's a couple different ways that we could try and collect fish. One is by setting gill nets that would entangle fish. And that hasn't been very successful. When we tried that, may have tied that just one time.

**Tim Bister** [00:38:40] But what has been more successful is actually using our electro-fishing boat. We actually have a generator onboard a boat and it goes through a special box and puts an electrical current into the water and the fish that are in this electrical field around the front of the boat, will get stunned and we're able to net them on board to take measurement data, or actually some fish, as they've gotten larger, have actually been able to implant them with, with larger transmitters so we can track them into their adulthood.

**David Todd** [00:39:24] And I understand that y'all have switched transmitters, that earlier used radio-based transmitters, and now you're switching over to audio devices?

**Tim Bister** [00:39:36] Yes, yes. The transmitter is first used were radio, radio transmitters. And I think what Fish and Wildlife Service found was there is, although they could detect fish, there was some maybe some interference or some, some ghost signals. Some of these stationary antennas, they were supposed to be able to detect movement by having two directional antennas that detect a fish moving from one side of the antenna to the other.

**Tim Bister** [00:40:11] But, yeah, the switch was made last year, the year before, to try and use acoustic transmitters to where there can be some, some listening devices in the water in different parts of the river to listen for these fish. And then also be able to go out in a boat with a, with one of these listening devices and be able to detect fish. And so now that the fish are, so those first 47 fish I talked about having the transmitters? Well the battery life in a transmitter the size that can be fitted in one of those fish last about a year. Now that these fish are getting bigger, the ones that we're able to recapture, implant with a larger transmitter, which has a larger battery life, to be able to operate for several years.

**Tim Bister** [00:41:09] And the important thing to be able to do that is because it takes paddlefish so long to mature and be able to spawn, what we would ultimately like to do is be able to track them to some identified spawning areas, either that, the gravel areas that were

installed by the Corps of Engineers or several other areas that have been identified through just surveying the river. But we have to be able to track them long enough to 8 to 10 years old it takes a fish to get before they spawn. And we're actually getting to the point where we've got some of these fish that are that old that we've been stocking so far. So it's, we're getting closer to an exciting time to where we might actually start seeing some, some natural reproduction from the fish that we've stocked.

**David Todd** [00:42:03] Well, that's must make you very enthusiastic. So, I'd understood, and this may have been from an earlier conversation you and I had, that part of the reason for soaring politicians, of course, for the paddlefish's own existence. But I think you had mentioned that it's kind of an indicator for other species. And if it, the paddlefish does well, then other species benefit as well from the different regimes, and so on. Is that the right understanding?

**Tim Bister** [00:42:45] Yeah. So these, so the work with, with, especially the flows, the flows project and to mimic this natural river system downstream of Lake o' the Pines has so many benefits to fish and wildlife and connectivity to back water areas and the plants and trees that, that are in these, in the area of the river. It's so much larger than just the paddlefish.

**Tim Bister** [00:43:25] You know, I've been asked over the years, you know, why are you doing this with the Paddlefish? It's well, for one, you know, paddlefish used to be here. So it's, it's, it's a good project to restore them to this river. But it also impacts and benefits probably 30, 35 different species of fish that have these similar requirements for, you know, flows at certain times of the year and being able to maintain the river channel and, and that's really what it's all about. It's about the river. Much more than it is the paddlefish. But the paddlefish is such a great poster child for all the work that we're doing. It's an interesting looking fish. It attracts people to wanting to know about the project and why we're doing it.

**David Todd** [00:44:25] So we can understand, some of the details of this. Could you give me some examples of these other fish that are sort of collateral beneficiaries of what you're doing for the paddlefish?

**Tim Bister** [00:44:37] Oh, yeah. David, I don't have that list in front of me and just there's, there's lots of different species in the river. And I think that the best thing that I can say now is just that, it's definitely beneficial to them from an, I don't even know, there's so many it's, it's hard to know where to start.

**David Todd** [00:45:09] Yeah. Well, aside from other aquatic creatures, I gather that some of these changes in the flow regime to return the pulse flows may be benefiting some of the forest, some of the bottomland trees like the cypress. Is that right?

**Tim Bister** [00:45:34] It is right. I don't know so much about the cypress, but there's, there's a researcher who has been looking at these changes in the plant and tree community in connection with these environmental flows. So that's interesting, too. So we've got, you know, people working on things all the way from in the water to up on the land. And it's all connected to, to the river.

**David Todd** [00:46:05] Sure. You know, I think it's interesting to me that you've worked with so many different kinds of fish and, and I think at one point you told me that a lot of your work has been with game fish, like bass and sunfish and so on. I was wondering if you could

compare your experience with this very odd filter-feeding Leviathan with game fish that you know, people see more often and catch and cook for dinner.

**Tim Bister** [00:46:38] Sure. Well, that's, that's right. Our main charge here in the, in the fisheries district is, fisheries management district is, we are managing fisheries in public water for angling, for the anglers of the state, whether it be largemouth bass or catfish, the prey species that go along with supporting those, those sport fish populations. So we do surveys looking at those fish populations. I may recommend different harvest regulations, may recommend stocking of those, of those species to, to supplement or support, you know, our management goals for managing the sport fish.

**Tim Bister** [00:47:30] To have an opportunity to work with a species like the paddlefish is different. It's something different than, than I do year-around in the district. So it's, it's a nice change, especially when you see all the people that have been involved, all the other partners involved in this paddlefish project. It's, it's really exciting to see how, how many people are interested in paddlefish.

**David Todd** [00:48:05] Well, you know, that, that leads to a question that I wanted to ask you. If, you know, that you were talking about this sort of ancillary benefits from paddlefish recovery, thirty, thirty-five other species and then plants and so on. But it sounds like there's a lot of interest among people and it might be a benefit to people in their education, about the environment and conservation. Is that fair to say?

**Tim Bister** [00:48:33] I think it's fair to say that. Actually the paddlefish project has actually been taught by, or been part of some curriculum and some of the science classes. One of, one of our partners in the project, the Collins Academy in Jefferson, they have been working with educators and school groups having this, this paddlefish project part, part of their curriculum. And students have actually come out and seen some of the paddlefish releases, and some of them have actually been able to, to hold the paddlefish and actually release it from the from the hatchery truck into the river. So it's I think it's, it's opportunities like that that create an excitement for especially younger people to learn about a project like this, how it's, you know, yeah, here's a really cool fish, but this is why we're doing it and all the other things that are involved in the river ecology that relate to the project to, to kind of increase interest in the environment. And river ecology is really important.

**David Todd** [00:49:58] Well, that's neat. It seems like it's, this program you've been involved with has had lots of benefits for, you know, partnerships with other agencies and for paddlefish itself and of course, other fish and plants, and then for the community at large. So that's, that's wonderful. Is there anything that you might want to add about what you've learned from this experience with the paddlefish?

**Tim Bister** [00:50:27] I think one of the biggest things is just how many groups can come together to to work on a common goal. When we look at all the different partners, you know one of the primary partners is Caddo Lake Institute. And their involvement with organizing the early flow ecology meetings and their continued involvement would up here until today working it. The Nature Conservancy has also been a big partner, along with the Corps of Engineers, and the Northeast Texas Municipal Water District, among others, many others. And then just the public that have come out to see these paddlefish stockings and how excited they are. I think that's been one of the biggest things for me is take a fish like the paddlefish and how unique it is and the excitement of, you know, maybe really having a good chance of getting the population back in, in Big Cypress, is just great.

**David Todd** [00:51:37] Well, I wish you the best. It's great that you've committed so many hours and years to seeing this through and I hope that you have success in the end. Is there anything you'd like to add, or we can wrap it up?

**Tim Bister** [00:51:53] I think that pretty much covers it. I can't I can't think of anything we missed.

**David Todd** [00:51:57] OK, well, Tim, it's been wonderful to talk to you. Thank you so much for your time and I hope our paths cross in the future.

**Tim Bister** [00:52:06] OK, great. You're welcome, David. I've, I've really enjoyed being part of it.

**David Todd** [00:52:09] Well, good. Thank you so much. You have a good day.

**Tim Bister** [00:52:12] You too.

**David Todd** [00:52:12] Bye.

**Tim Bister** [00:52:13] Bye.