

TRANSCRIPT

INTERVIEWEE: Mike Montagne

INTERVIEWER: David Todd

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

David Todd [00:00:03] Good morning.

Mike Montagne [00:00:05] Morning, David, how are you?

David Todd [00:00:07] I'm fine, fine. Thanks so much for calling.

Mike Montagne [00:00:11] Oh, you bet, you bet. I took some notes this weekend and just to kind of keep me on track. There's so many different directions to go in when you start talking about paddlefish, all the things we've learned and all the ways we've gone. So I wanted to kind of keep my train of thought going.

David Todd [00:00:29] Yeah, absolutely. I know this sort of gives it all short shrift. But, you know thanks for giving us a start, a little introduction to, you know, your story and also your perspective on the paddlefish.

David Todd [00:00:44] So, as you know, we'd really like to preserve this for the future. And one of the things I really wanted to start with is to get your approval to record it. And I have a little explanation of what we plan to do. And maybe you can think about making sure this is just good for you.

David Todd [00:01:07] Our thought here is to plan on recording the interview for research and educational work for the Conservation History Association of Texas, and for a book and a Web site at Texas A&M University Press, and for an archive at the Briscoe Center for American History at the University of Texas at Austin. And you would have all equal rights to to use the recording as well.

David Todd [00:01:33] And I wanted to make sure that that sounds good for you, and if you want to proceed.

Mike Montagne [00:01:38] Sure, that sounds right.

David Todd [00:01:40] OK. Well great. Thank you so much. Well, let me lay things out a little bit of it, so that people know when and where this is all happening.

David Todd [00:01:51] It is July 20th, 2020. My name is David Todd. I'm here for the Conservation History Association of Texas. I am in Austin and we are conducting a phone

interview with Mike Montagne, a biologist, a project leader with U.S. Fish and Wildlife Service in San Marcos, Texas.

David Todd [00:02:12] And today we'll be talking about his life and career and much of his work on paddlefish and their restoration. So with that, I wanted to thank you for taking some time to talk.

Mike Montagne [00:02:28] You bet. Sounds good.

David Todd [00:02:31] Well, usually we start these interviews by just asking about your own background and how your interest in wildlife and the outdoors might have begun.

Mike Montagne [00:02:41] Sure, sure. Well, I was born in central California, in the San Francisco Bay Area, and I always loved camping and being outdoors. And that was always kind of the way I wanted to go. But of course, I was a kid and I didn't know where I was going.

Mike Montagne [00:02:57] Then when I was in high school, my father moved to Colorado up in the mountains above Denver, and I went out there to visit him and I never went back. I loved the hiking, the camping and the backpacking so much, I just wanted to stay there. So after I got back there, I bought a jeep and I started camping and fishing all the more. So I was just out in, out in the wild all the time. And then about 1983, I saw the movie Never Cry Wolf, which probably brought a lot of us into biology, if you were about my age, because it was a movie about a biologist going up into Alaska and studying wolves on his own, with not real, a whole lot of experience. And he just kind of jumped into it, head first and went about it. And that kind of inspired me to get into that kind of thing.

Mike Montagne [00:03:52] So after I graduated from high school, I went off and I went to Humboldt State University in Northern California, where I studied wildlife management. While I was there, my advisor mentioned that I might want to take in a fishery unit to qualify for a fisheries job. So I did. And that's kind of the jumping-off point of where I got into fish, fish biology.

Mike Montagne [00:04:16] I've worked for a lot of different agencies. I've worked for the Forest Service studying Spotted Owls. Back when I was in college, I worked for the U.S. Army Corps of Engineers, working with salmon migration on the Snake River. I've worked with cutthroat trout for the State of Colorado.

Mike Montagne [00:04:35] And back in 1994, I got a job with the U.S. Fish and Wildlife Service in Grand Junction, Colorado, working for the Colorado River Recovery Program. And we were trying to recover four endangered species of fish - a large variety of partners and a very big program. One of the things we were doing there is we were radio tracking fish in the Colorado, Gunnison and the San Juan rivers. We were conducting population estimates, reintroducing species, and implementing fish passage projects. It was there when I knew that fisheries was for me because I'd never had so much fun in my life. Eventually when I was there, I got hired to help build and manage the fish propagation program. And eventually managed, ended up managing the Ouray National Fish Hatchery in Vernal, Utah, where I was until 2010.

Mike Montagne [00:05:30] And in 2010, I was hired to be the project leader of the Texas Fish and Wildlife Conservation Office in San Marcos, Texas. The office had been closed for about 12 years, when I got there and they gave me a truck and a computer and an office, and away I

went. And after 11 years ago, about 10 years or so, we've kind of grown up to about three biologists. We have two biological technicians and an administrative assistant. And we conduct projects all over the state of Texas, ranging from aquatic invertebrates sampling, looking for blind catfish, salamander monitoring, coastal fisheries work. We do a lot of fish passage projects, habitat restoration and tidal fish reintroduction.

David Todd [00:06:21] Sounds like you're busy.

Mike Montagne [00:06:23] Yes, for sure.

David Todd [00:06:25] Well, this is a great story. You mentioned that one of the aspects of your work is is on Paddlefish. And I was hoping that you could give sort of a layperson-friendly description of their characteristics in their life, their habitat, and maybe a little bit about their evolutionary history, which I think I've heard is very ancient.

Mike Montagne [00:06:53] Yeah, for sure. The paddlefish is one of the oldest living species on our planet. They're about, they date back in the fossil history about, about as far as 300 million years ago, which is prior to the dinosaurs roaming the Earth. So they survived these mass extinctions that took the dinosaurs out.

Mike Montagne [00:07:16] And if you look at them there, they're incredibly ancient-looking species. They don't look like anything else. Now, there's been two species of paddlefish while we're still on rare earth. The Chinese paddlefish, which is now since gone extinct, we believe. No one's seen one since 2003, but they used to be, they've been documenting up to twenty three, twenty three feet long and weigh almost a thousand pounds. Like the American cousin, the damming of the rivers in China as well as commercial overharvesting, ultimately led to their demise. So, like I said, they are believed to be extinct.

Mike Montagne [00:08:00] In North American, in North America, we've got the American paddlefish, just called the American paddlefish. And that sticks sometimes, but it's just the paddlefish. Their populations began to decline in about 1900. There was a lot of commercial harvest on them. Of course, we were starting to build a lot of dams around that time too.

Mike Montagne [00:08:23] But the paddlefish has been throughout North America and in many large river systems, any low-, any slow-moving, large river system. They they can inhabit in North America. And in fact, they're in multiple, multiple states through the Mississippi and the Red River, and other places up north.

Mike Montagne [00:08:45] As far as their biology's concerned, they are a very long-lived fish. They can live up to 50 years making way up to and over 200 pounds and reach up to over seven feet long. As a long-lived species, like most of them, they don't start reproducing until they're 6 to 8 years old. And we'll talk about that a little more later because it comes into play. They inhabit large slow-moving freshwater rivers throughout North America.

Mike Montagne [00:09:14] And if you see a paddlefish, it's like no other fish species you've seen. It's large and gray. It's got a shark-like body and a deep forked tail and a long flat-bladed like snout, which they often called spoonbill catfish because of this long nose and long rostrum that they have, which is almost a third of its body weight.

Mike Montagne [00:09:38] And they use that paddle to help sense where the plankton are, since the paddlefish are filter-feeders and they swim through, they eat by swimming through

the water with their mouths open just like a whale, and they shovel the food back into their gill rakers and down into their throats. And that's when it gets sloughed down into their bellies and that's how they feed.

Mike Montagne [00:10:03] So for that reason, they actually are tough to catch in terms of like a regular hook and line because they don't go after a lure, per se, because they're just going after microscopic organisms in the water and filtering back into their thing. So when they are caught, they're usually caught by snagging with treble hooks or by nets. And so actually, that makes them tough to catch unless you're really trying to actually go after them.

Mike Montagne [00:10:31] And, but I'd like to emphasize it's illegal to purposely try to capture paddlefish in Texas and certainly illegal to keep them or possess them in any way or fashion.

Mike Montagne [00:10:45] The one thing I'd say about the paddlefish, is they are, they're like no other fish. And once you've seen a paddlefish, you'll never mistaken for something else. It's not like a bass where you look at it and try to figure out what species is. When you see it, you're like, wow, that's a paddlefish because they're just so unique.

David Todd [00:11:07] And I guess quite rare. You mentioned that, that their population started to decline around the turn of the last century, around 1900 due to commercial harvest and and maybe some of these early dams. Can you talk about what might have happened here in Texas? I understood that that part of the harvest was for roe. And is that true?

Mike Montagne [00:11:35] Yes, it is true. You know, paddlefish, because we're so big, they have a lot of eggs and they're a, they're not similar to sturgeon other than the fact that their roe is a valuable commodity and they can be overfished heavily to get those roe. And a lot of times, of course, as biologists, we find ways to squeeze the eggs out of them manually and not hurt the fish. But, you know, in a commercial situation, they're just going to cut open the fish, take the eggs and then those that fish is going to die. While certainly it's an issue, it's probably just an additive issue in terms because there is really the manmade barriers that caused their problems. But as far as caviar goes, it's funny because while that might make them in danger, meaning people want to go after them, there's actually a couple states in the United States that have a caviar collection program where you if you can where you can catch, can catch paddlefish in some states. And if you bring it to their special handling facilities, they'll, they'll cut up the paddlefish for you, give you the steaks, they'll collect the caviar and then they sell it commercially. But then they take that money and they use that, they use those funds to do paddlefish research and production type things with that money. So it's kind of a double-edged sword there. Some states have capitalized on that, while other states, of course, like Texas, we don't have nearly enough to even try something like that.

David Todd [00:13:09] And was there a significant caviar or roe trade back in the teens or twenties? I'd heard this anecdote about, I think it was Lady Bird Johnson's father, Mr. Taylor, and that he was involved in early harvest in Caddo Lake. And the story's popped up a few times. But, I didn't know if you're familiar with it.

Mike Montagne [00:13:38] I'm not very familiar with it, it doesn't really surprise me at all. Obviously, if there's some sort of resource, if you go back to the early 1900s, we overharvested in commercial and did a lot of commercial consumption of a lot of things to the point where we're knocking a lot of species out. And so it wouldn't surprise me at all if that

was the case here in Texas. I've not read that part of the history, but it would not surprise me at all.

David Todd [00:14:02] OK. So I think the other thing that you had mentioned that it's been a real challenge for paddlefish is the construction of dams. And I was hoping you might be able to explain what it is that, that dams do to paddlefish, that makes it hard for them to survive and reproduce.

Mike Montagne [00:14:25] Sure, sure. Sure. And over time, we've certainly seen that the declines are directly attributable to manmade barriers. Of course, as this, as humans, well, we do what we do. We like to, we dam things up. And, of course, humans, we kind of need dams. We have it, we need it for water storage. We need it for flood protection. But they often create large problems in the environment, such as sedimentation issues, erosion, channelization, loss of wetlands and, of course, habitat fragmentation.

Mike Montagne [00:14:58] But of course, as humans, we need those things. But they do cause a lot of problems out in environment, not just for paddlefish, but for many species. Now, of course, these paddlefish have evolved over hundreds of millions of years in the natural river flows, which have never been dammed until we started doing it until about the 1900s. Paddlefish have been known and documented to migrate over 2000 miles to reach their spawning areas. And so they need these large stretches of river to complete their life cycles. And these very, these manmade structures create barriers for them that they just can't get past to get to their important spawning habitat sometimes.

Mike Montagne [00:15:43] But perhaps more importantly than just the actual barrier itself, the structures alter the dynamics of the habitat and the hydrology of the river. We're talking, alters the river in such a way that their spawning habitat that is available is no longer usable, say it's now covered in silt or the water's too fast-running or they need it, or too slow and too stagnant. You can't get enough oxygen in there to keep the eggs alive. So just the chain.

Mike Montagne [00:16:12] And we've also lost nursery habitats for these paddlefish are relying on flooded bottom lines as well for nursery habitats for their none. And so there's so many things that manmade structures can do beyond just create a barrier for them to get past that. If they can all, and any one of them can make a break in that life cycle, paddlefish and other species of fish, which they can no longer overcome.

David Todd [00:16:39] So can you go into a little bit more detail about this idea that flooded habitat is important for the nurseries? I'm not really familiar with that.

Mike Montagne [00:16:50] Sure. Sure. So a lot of species not just out this, they're relying on the flooded bottomland to create nursery habitat for their, for their young. They'll, they'll, a lot of times they will spawn in the river itself. And then when the larvae hatch, they are, it's usually during high-flow events. They've evolved to do this and they flow in, because they're not very good swimmers, they just kind of go with the flow and they end up in these flooded bottom areas. And as the river recedes, though, these areas a lot of times will hold water in them and they stay in these areas that are highly productive, where they can get a lot of food. And a lot of times the bigger predators moved back out because they've been around long enough to know that once that water starts receding, they need to get out of there. And so they try to get out of there. And that leaves these flooded bottomlands a lot of times for these species to go into and grow and develop and they'll sit in there for whoever knows how long, depending on which, when the next flood comes in, where they've gotten considerably bigger

and, and gained a little bit of experience and life experience. And then when the big floods, the next flood comes through, they're able to go back out into the river as a little bigger fish, having been a little bit protected in those nursery areas. And a lot of different species use those. And we find a lot of times when we're having a problem with species that because of dams that we've put in, that's one of the issues that they're facing is this loss of flooded areas. And of course, as humans, we don't necessarily want them flooded or we want them to be farmlands. And so flooding is not ideal. So we have to find some sort of balance between flooding farmland and human uses, basically, versus the ecological necessity of those flooded bottom lines.

David Todd [00:18:38] I see. I think you also mentioned that these dams just upset of the natural flow regime that maybe supports these shoals where they might spawn. Is that right?

Mike Montagne [00:18:57] Yeah, yeah. Let's say, for example, that you put a dam in and you have low flows, because you're saving all that water, which is what we've done in the past. You're saving all that water for human consumption upstream or even sending it downstream occasionally, but only when it's called for by human needs. A lot of times, that, those spawning shoals can be covered in silt where they become unusable for the paddlefish or and others and many other species of fish. And so those, instead of having this gravel or rocky bottom that the fish can use to, to spawn and use as spawning habitat, you now have this silt-filled channel, basically, that they, they can't really use because there's no place to deposit those eggs. If they put their eggs down in that silty bottom or in that mushy bottom, sometimes they'll suffocate in the sand. The eggs will die. And obviously, that's a break in the lifecycle that they can't get past. And so actually flow, we have, we need flushing flows. We need certain flows to keep those spawning shoals clean. As well we need like as well as the slower flows, so those larvae and things can develop in those flooded bottomlands. So yes, flow is just, flow affects everything. And a lot of times when you're dealing with endangered species, flow affects almost every part of their environment and changes what they need. So it's having some sort of natural river flows is super important to most species of fish.

David Todd [00:20:26] So it sounds like these dams blocked travel to the shoals and maybe to some of these nursery areas, but also just the interruption of the regular pulse and, you know, flood and drought kind of regime that might have been current before the dams were built - that's a problem.

Mike Montagne [00:20:51] Yeah, for sure. And, you know, like I said, you know, humans, as humans, we need the water and we need the flood protection. Dams do a lot of good things for humans. And we over the, in the past have only run them for humans. And that becomes a problem for most river systems when we do that. Humans don't need water necessarily at the same time the fish do. Not so much here in Texas, in a lot of places fish rely on snowmelt coming out of the mountains and a big pulse of it at certain times of the years, so they can do their spawning when you get those fish into the flooded bottomland areas and nursery areas. And so that become at a certain time when those fish are ready to spawn.

Mike Montagne [00:21:31] And of course, in Texas, it's a little different. We're spring-driven, we're rain-driven, not as much spring runoff from snowmelt, but nonetheless, all these species that are reliant upon these areas in Texas have come to have evolved in the system that they're in. And so when we change that system, it has a big impact on a lot of different species of fish.

David Todd [00:21:55] That's interesting. Well, you know, just to sort of bring it home to Texas, could you maybe talk about how people learned that this was the case with, with paddlefish, that they were really reliant on free-flowing rivers? If I read about this correctly, that there were populations of paddlefish in the upper Sulfur, for example, that pretty much disappeared after Wright-Patman reservoir was built in the 50s. And then later on, sort of the same thing happened the Neches when Sam Rayburn reservoir was completed. Can you talk a bit about, you know, the history of that here in the state?

Mike Montagne [00:22:40] Sure. You bet. Yeah, of course, there's been Texas in a lot, there's been paddlefish in a lot of east Texas rivers over in history. And of course, as we start damming them up, they started to disappear. One of the problems that we run into with long-lived species is you don't realize you're in trouble until it's getting really bad. Because if you have a species of fish that can live, you know, 30 to 50 years, you'll see it out there. So even if you've made a break in its reproductive cycle, if it can't reproduce anymore, you're still probably going to see those adult fish for 30 to 50 years. And so what happens is you think they're fine. And in the meantime, they're not reproducing and recruiting into their population. And after about 30 to 50 years, all of a sudden they're just gone. And no one's really noticed until it's too late, almost. And that's why we've lost a lot of a lot of paddlefish and a lot of systems in Texas because we have dammed them up, a lot of them back in the 50s and 60s, which is just when we started doing a lot of that to make these big reservoirs for people. But it's not just paddlefish, we've seen this happen. I've seen that happen in other states and other places as well. These long-lived species, they start suffering and you just can't tell they're suffering for quite a while because you still see them. You don't recognize you, you're not seeing the little guys anymore. But you see the big guys and say you think we're fine. But it turns out they're not so fine. And it's just a matter of time, once you've broken that reproductive cycle, and that life cycle, that they're going to disappear. You just aren't going to see it for a while. And so it's, it's a real problem with long-lived species is that we don't know something's going on until it's almost too late.

David Todd [00:24:27] Well, can you give some examples of other species that suffer the same sort of problem because of the long lag time between when reproduction is cut off and when we start noticing die-off.

Mike Montagne [00:24:42] Sure, sure. The four endangered species on the Colorado River and the upper Colorado River are the ones I started working with. And that's where I first started to see it. And of course, once you start seeing it, you start to see it other places, too. The Razorback sucker is one of the big ones in the Colorado River system. Colorado pike Minnow, humpback chubs and bonytailed chubs are all long-lived species in the, in the Colorado system. And one of the things that we noticed is that there were around for quite a while, even after we put in the dams up, up in the high country to collect the water until, until the early 90s, or late 80s, early 90s. And we weren't seeing them anymore to the point where we finally started seeing it. And we started, for example, for a Razorback sucker, every time we saw one, if we were out sampling, we stopped, we'd call in, the helicopters come in, and we take him into captivity, bring it into a national fish hatchery. So that's how close we got to the edge with the paddlefish, or with the Razorback sucker. And there's the same thing going on with the Colorado pipe minnow and the other species in there as well. So those long-lived species, like you said, you don't notice it for quite a while and then all of a sudden like, hey, we don't see these anymore. And it becomes desperate at that point.

David Todd [00:26:05] Interesting, and sad. Well. I think that a lot of the focus on the paddlefish, both its decline and its restoration, has been in the Caddo Lake area. Is that right?

Mike Montagne [00:26:26] Yeah, for sure. We've, back in 1959, the Ferrells Bridge Dam was made to create Lake o' the Pines, and before that time, paddlefish had been found in Caddo Lake and up to Big Cypress Bayou. And, like I was just talking about, no one really noticed the big decline in them until no one was seeing them again in the 80s. And so people started to recognize these fish were gone. And so in the 1980s, late 80s and early 90s, TPW, Texas Parks and Wildlife Department, began a reintroduction effort not just in the Big Cypress, but in the Neches and some of the other rivers out in the East side. And they started restocking paddlefish into the Big Cypress and the other, and the other rivers as well. Between, back in the 90s, they put in about 81,000 fingerlings in the Big Cypress Bayou hoping to bring them back. They put them in at a little less than 10 inches. And one of the big problems you had in there is, of course, the Big Cypress Bayou, Big Cypress Bayou, and Caddo Lake is a huge area. Caddo Lake is like 25,000 acres and there's 45 miles of river habitat. And so you put in 81,000 small fish and you think that sounds like a lot, but 81,000, and then you're trying to look for them and that kind of area, it's a lot like looking for a needle in a haystack. And of course, they weren't find any. And so trying to prove that they were recruiting or taking off and do population estimates of survival and do survival estimates and things like that, were virtually impossible for them because they just couldn't catch them again.

Mike Montagne [00:28:27] And so they gave up. They gave it up and about 19, I want to say '98, I believe, putting fish in there and they just kind of somewhat wrote the paddlefish off. They, one of the things they assumed because they weren't catching them, that they were going over the spillway at Caddo Lake dam and they were losing all the fish that way. But they didn't really have any proof to say that. But it is also how this kind of whole idea of the paddlefish project out in the Big Cypress Bayou got started is that they thought, well, they're all getting washed over this dam. And we know that barriers are an issue for them. Maybe we need a fish passage, fish type of ladder for paddlefish going over this big spillway down at the bottom of Caddo Lake. And that's actually how we got involved in potentially the paddlefish reintroduction project there on the Big Cypress.

David Todd [00:29:23] Well go ahead. Yeah, so. So what happened with the next step on the paddlefish reintroduction?

Mike Montagne [00:29:29] Well, sure, with that, of course, when I got to Texas 10 years ago, there was a fish passage project on the books that Texas Parks and Wildlife Department had been wanting to get involved in. So I showed up and it was actually the only set project that I had to do when I got here is they wanted to put in the fish passage potentially at the Caddo Lake spillway. So I went out and met with the TPWD biologist, one of whom was Craig Bonds, who is now the head of Inland Fisheries for TPWD (it was 10 years ago, of course). But we went out and we looked at the dam and we started talking about it again. At this point, I knew nothing about paddlefish. I had just moved to Texas, first time to the east of the Rockies for the most part in terms of working. So I knew nothing about it. So I was just kind of picking their brains and talking to them about it.

Mike Montagne [00:30:29] And they, they mentioned that, until they put in the dam at Lake o' the Pines, that they had paddlefish there in the system. And that struck me right there. And I just thought and thought to myself, well, you know, maybe we're looking at the wrong dam. And so we started talking about the dam when it was built and how that might be affecting things. And so we kind of started drifting away from the paddlefish ladder, knowing that, you know, a project of that size was going to be a million dollar project, which is pretty tough to get funded for something you're not sure that's even going to work. I'm not sure how many

paddlefish fish ladders have been built, but I don't even know what they would look like. And so we were kind of laughing and joking about it. And I just started thinking more and more about it after we left that day that, you know, do we... One, we don't know that they lost the fish because they went over the dam. And two, before I wanted to spend that kind of money, I wanted to make sure that was really the issue.

Mike Montagne [00:31:33] And so we started thinking about what we could do to prove they would stay in there. And of course, radio tracking came to my mind because I've been, I've done it in the past. And that's a good way to track some fish and find out what they're doing in the system and where they're going. So it actually took a couple years of us talking to folks and trying to get everybody on board.

Mike Montagne [00:31:56] And about this time to the Senate Bill 3, which was the, it was the, it was an effort by the Texas Senate to make sure, to ensure that rivers were getting ecological flows so that there wasn't just all for humans in trying to protect water rights and flows for the rivers in Texas. And about, and actually before then, there was a group in the Big Cypress Bayou and the Caddo Lake area that were trying to come up with some environmental flows that they wanted to start implementing coming out of Lake o' the Pines. And so there was already this big group doing this. They came up with some environmental flows and they actually implemented them in 2011, voluntarily implemented them, I want to say too, in 2011.

Mike Montagne [00:32:48] Well, that's right there. And from our talks and others have been thinking this, too, is that we, we kind of directly attributed the loss of paddlefish in that system to the way the dam was being run, or at least the dam being there, that maybe it was just in the way it was being run because it was not being run in ecological fashion until it's up to that point in 2011.

Mike Montagne [00:33:15] So we started garnering support to begin a paddlefish, kind of a, just kind of an example project, to see if we could actually get them to stay in there. And we got a lot of support. And so by 2014, we actually were able to start a project that we started putting radio tags, fish back into the Big Cypress Bayou to track what areas they would use and see if they would stay on this on the upstream side of the dam or whether they would in fact go over that. So what we did is we, we implanted 47 one-year old paddlefish that we got from Tishomingo National Fish Hatchery up in Oklahoma with some one-year radio tags and you actually do surgery on the fish and plant the tag right inside their body, sew them back up and then release them back into the water.

Mike Montagne [00:34:16] Well we had 47 of those fish. And we stocked them into the Big Cypress to quite a bit of hoopla. There's a lot of fanfare. A lot of press was there. A lot of people were sponsoring the fish and they could track their fish on a website because we'd get in and track the fish all around the Big Cypress Bayou and Caddo Lake. And then we'd announce what their locations were whenever we'd go out and they were able to track those fish. And we are getting a lot of attention.

Mike Montagne [00:34:46] And we're, we started tracking these fishing, some of the things we found out where some of things were really surprising. And one of the biggest things that we found out is that of the 47 paddlefish that we put in there that were radio tracked, we were not able to prove a single one of them went over that spillway. And so all 47 of those paddlefish, although one died pretty quick, so I'm going to say 46, stayed in that river system. Very few of them even use the lake. They just stayed up in the river system up in the Big Cypress Bayou, and the majority of them went directly up. Maybe it was the time of year we

restocked them. They went directly up and sat below the Lake o' the Pines Dam for a lot of a year. They, if the flows would go down, we'd tend to see a decrease, in a number of them and a lot of them would start going downstream. And whenever, every time we get a pulse, we'd see a big pulse of fish. Every time we get a pulse of water, we see a big pulse of the paddlefish heading back up to the dam. And the other places that they were they were going were the confluence of the big the Black Cypress and the Little Cypress as well. Those were the three areas we found they were congregating. And so that was interesting information to us.

Mike Montagne [00:36:04] And the other thing that we found is that these are the areas besides out in the lake that had the largest densities of plankton. And so they are going there because these are the best places to feed. And they, they, they just knew that. And that's where they stay. Now, originally, we thought because they'd go and they'd stay there, we thought, boy, I think maybe these fish are dying. But what we did because we knew where they were, is we were able to go in there with some electrofishing boats and read recapture them and see they were doing just fine. And they'd grown a tremendous amount and they were healthy. And we were able to just prove that they were alive, even though they tended to stay in the same spot just because it was beneficial to them.

Mike Montagne [00:36:52] And what that was kind of the neat thing. It kind of showed us where these fish were going to be again, which is one of the things that they couldn't find them in the previous study to know how they were doing. But now we knew where they were staying and where they would go, and a likely place to catch them. So that was kind of cool.

Mike Montagne [00:37:11] So during that study, we put up three different towers. One was a stationary tower, one was at the Caddo Lake spillway, which is, well, the one that enabled us to be sure that nothing was passing it and that none of the fish were going out of the system. Another one we had up was in the riverine section up north of, or upstream of Jefferson, Texas, which is the riverine section, kind of a break in the habitat, if you will, into a different spot, or into a different type of habitat, more riverine, creek-like, than the rest of it. And then one down in the river, or the lake-influenced area, down by Uncertain, Texas. And so we had these three towers that were constantly reading for anything that would pass by. And we were able to tell when they were passing and it kept a record of that for us.

Mike Montagne [00:38:04] And then about once a month, we go out and we would look for them just in a boat listening for those radio tags. And then we'd find them, document their locations, update that to the Web site and people would start following those fish. Well, we did that for the juvenile fish - they were about 15 inches long. And because of their size, we could only put a tag on them that lasted for one year. So at the end of that year, we had a certain dataset that told us that they stayed in the area. They favored these certain areas. We could get them to move with flows and that, that's what these juveniles were doing.

Mike Montagne [00:38:44] So that was kind of the first phase of the, the radio tracking project that led us to believe that there might be some sort of future in trying to get more of these in there and seeing what more of them were going to do over time.

David Todd [00:38:59] So it sounds like the this telemetry helped you understand a few things, if I'm following you. One is that they seem real responsive to the hydraulic, hydrologic pulses down near the dam, Ferrells Bridge Dam. And that they were I guess they were attracted to the plankton there. They weren't going over the spillway. And you had pretty good survival. What else did you learn, do you think, from that first phase of your project?

Mike Montagne [00:39:36] Well, what, some of the things we learned is that we don't know enough still, and that we still have a long way to go. Of courses, I say we were tagging juvenile fish and I said earlier that they don't start to reproduce until they're six to eight years old. And so what we're finding is what the juvenile fish will do. We still have no idea what the adult fish were going to do and whether they could try reproducing or whether they were going to be able to do that or what kind of which areas they would use to do that. We had no idea what adult fish were going to do. And of course, we, we still don't, because it's been so, it's been such a short amount of time. And so we still have a lot of questions, we didn't know if what we saw happen was a freak thing or whether it was a normal thing.

Mike Montagne [00:40:26] And so we actually decided to do it again, just to kind of make sure. And this time we said, well, you know what? We put the fish in all above the lake and most of them went upstream. And what would happen if we put them in the lake? Would they then just stay in the lake knowing that that's a very dense population of plankton as well for feeding? Because these, we're looking now at all of juvenile behavior. We're still not knowing anything about the adult behavior in that system. So now we, so we did put some more out again in the next two years. And then we started chasing those around again. And we found that when we put them out in the lake, still none of them went right upstream. But a lot of them actually stayed out in the lake. They were in various spots. And we, but we did not find any of them going over the spillway again. So that was another, that was something that we were really wondering if we put them down in the lake would they head over the spillway. And the answer to that was they did not. But what it left us with, these, these early experiments left us with, was is that we still really don't know what the adults are going to do. And we're really limited at that point because you can't just go out - no hatchery has adult paddlefish, not very, I wouldn't say very many of them, hatcheries, have adult paddlefish, certainly that they're willing to part with because they're probably brood stock. And so we we wanted to go out and find some adult paddlefish, radio tag them, and see what they would do out there. But we just could not get our hands on any of them. And so what we decided to do is we said, OK, you know what? We now kind of know where they're at. And at this point, we're at like 2017. So we've got some fish and we put out in a year-, year-olds in 2014 and now it's 2018. And so we're 2017. So we've got about four-year old fish, but we really need some bigger fish so we can put in longer-lasting tags so that we can find out what the adults are going to do when they reach adulthood finally. And so we used that information knowing that they would potentially start grouping below the dam if we follow the pulse flow.

Mike Montagne [00:42:41] So we waited for the Army Corps to have a pulse flow and then drop their water down. And we went up there with electrofishing boats and we caught, I think it was 17 of them, and we put in three- to four-year tags in them. And so that would at least get us to where they were starting to reproduce and they would give us some idea of what the adults were doing in the future. That future's now. We're just starting to get to an age where some of those earliest ones that we stocked and recaptured, and retagged, are getting to the point where they're, they're going to start showing reproductive behaviors so we can start watching what they're doing.

Mike Montagne [00:43:20] One of the things that we're kind of stuck with, though, is that the, for some reason, we don't know why, the, that area is just plagued by a bunch of radio interference. And so it gave us fits and starts. We had to learn how to filter all the data because it would give us false readings. And we eventually learned how to filter a lot of it out. But it just never ended. We'd always be stopped. And you're listening to something that sounded like a radio tag that just wouldn't, we couldn't be sure and couldn't verify. And we didn't want to start making assumptions based on false data. And so we decided to make a switch over to

a different tag, which were called acoustic tags. And they make a little beep in the water. And it's actually, you can't hear it with your naked ear, but with the receivers that we place in the water, also, we're able to hear those fish as they come near any type of line of sight. We're out in the lake, we can hear something from almost a quarter mile away. When we're up in the river, still got to be in line of sight. So it has to pass it to really get it. But what changed? The other thing we got besides the loss of this fake data that we were getting is we also were able to implant these tags that were, could last over eight years. And so that gave us a real opportunity to implant some bigger fish and then track them well into adulthood, to where we can really find out what those adults were doing and with the existing tags.

David Todd [00:44:52] And these were acoustic tags, the eight year old life, I think?

Mike Montagne [00:44:55] Say it again?

David Todd [00:45:00] No, I just was trying to make sure that these new tags that you put in - some were going to last three to four years. But those for the radio telemetry tags. And then the ones with an eight year life are acoustic tags. Is that right?

Mike Montagne [00:45:15] Correct. That's correct. So we're, we're slowly phasing out of the radio tags because all the batteries are wearing out and we're switching over to these acoustic tags because we have, we can get them to last much longer. It can give us certain information as well that the radio tags did not. And one of the, one of the really important things is that the receivers actually go right into the water, so it doesn't require a tower, which means that we don't have to have a cooperating land owner working with us. We can actually go put them right in the river or out in the lake wherever we'd like to really track where these fish are going. Texas, of course, is 95% privately owned. And so we rely, and still do, on a lot of private property, cooperation, private landowners' cooperation with us. And a lot of them are great and we use them still. But a lot, there's a lot of important spots that we don't necessarily have cooperation, and that we can now get to in a boat and drop one of the receivers in, in that spot in the river and go back to it without ever trespassing on anybody's land. And we're still collecting those important information.

Mike Montagne [00:46:24] And one of the things that we did around the same time as starting to implant these acoustic tags, is the Army Corps needed to do some repair on its spillway. And so they dropped the water down to near zero. We were able to then go down through that riverine section and we started mapping all these gravel shoals that we found. And so we went through this stretch of about (excuse me) of about 20 miles and we mapped about 14 gravel shoals. And most of them we didn't have access to through land, and we were able to then map them out so we can start going up there and dropping those receivers into those specific areas. And as these fish become adults, we'll be able to see if they're going to those areas at the right time there in the presumptive spawning times when the pulse flows are coming through there and we'll be able to see if fish are congregating there. Now if we're starting to identify fish congregating in those areas, we can actually then go in there and start looking for drifting eggs, so we can look for drifting larvae and see if they're actually reproducing, that they're actually spawning the eggs, that they're getting, if they're being able to hatch, if the larvae are drifting, if they're surviving from larvae to juvenile.

Mike Montagne [00:47:46] And so that gives us the opportunity to start looking at a lot of different life stages that we have not had in the past. So those acoustic tags are really giving us, they're really going to start giving us, some great information that we've been unable to get up to now.

David Todd [00:48:03] You know, speaking of these gravel spawning shoals, I think that I had read that, that there was an effort maybe in 2008, to actually lay down a shoal that Army Corps of Engineers and others were involved in. Is that correct?

Mike Montagne [00:48:21] Yeah, for sure. That was one of the, one of the reasons that we, we, we used to justify this early work is that we'd not only done the flows work, but we'd had some habitat work done as well. And I think it was 2008 when the Army Corps went in and they laid gravel shoals for this whole quarter-mile area of the river just upstream of Jefferson. Right at, right at one of our, the shoreline of one of our cooperating landowners who allowed them to go through his land and developed the shoal. And so they went in there with boats, little barges, and they take a little load of gravel and make these little square areas full of bigger rock that won't be swept away by the higher flows. And they made little patches of it all up and down this quarter mile stretch.

Mike Montagne [00:49:10] And so that was kind of some of the first work done. And it's not just for paddlefish. They named paddlefish as one of the main reasons. But, you know, all these species of fish that rely on that area, can probably use those spawning areas as well. And so there's this this one that we put in and a bunch of natural ones that we've now mapped that they didn't know existed before we were able to get in there (excuse me), it's one of the things that allowed us to do that.

Mike Montagne [00:49:37] As I mentioned, that the Army Corps was doing some work on their spillway, was this kind of an interesting side note and how we were able to get in there and find these areas but also do some other work, is that they needed to do this work, and so they're letting a bunch of water out in anticipation of shutting it down so they could work on it, and so that the low flows wouldn't cause some problems behind the dam. And so that actually attracted a bunch of fish right before they shut it down. And that attracted a bunch of paddlefish up there. We weren't expecting it, but we knew they were going to do it and we're going to take advantage of it. And they were hiring crews to come in, catch whatever fishes they could catch and move them downstream into where the water, area was still watered. Well, we figured if we got three or four it'd be great paddlefish. And there ended up being about a hundred and thirty paddlefish up in that area at that time that they were able to capture, move downstream, when we able to stock or we were able to implant about 20 of those fish. So that was pretty cool. And at the same time, we were able to then run down the river and map all those shoals. So we, had to use the, the flow change to catch the fish. And then we're and we mapped their habitat and get a lot more information as well. So that was kind of neat.

David Todd [00:50:56] It sounds like the, the switch in the kind of flow regime is a really important thing for these paddlefish. Can you talk a little bit about what, what you need to see to see the paddlefish really thrive in terms of the, you know, the pulses from Ferrells Bridge?

Mike Montagne [00:51:18] Sure. Well, that's the, that's the big question, isn't it? I mean, we, we've implemented a flow regime that we think will do better. We don't really know that it's going to do better. It's kind of a, it's an experiment, to be sure. And they call it an experimental flow. So, but what we're seeing and we've documented this, is that before we started this environmental flow regime, we've had historical collections and we're able to look back at the data. And we found out before the dam we had a lot of specialist species like paddlefish and blue and the bluehead minnow that that were out there in greater numbers. And then when we got the dam in place, and so we, the population changed from a specialist species then to

the generalist species - a lot of bass, catfish, things that don't necessarily need special circumstances to reproduce and do well. And so we saw this shift from this, the specialists into the generalists. And we've implemented this, this environmental flow now. And what we've seen, we're starting to see a shift back from the generalists to the specialists. And so that's kind of neat. So it's you know, it seems like we've been doing this for almost 10 years now and it seems like a long time. But in the ecological sense, it's not that long. And we're just starting to see some changes now. Things don't happen instantly, of course. And so we, we think we're doing the right things. But what, what we're seeing with the paddlefish is encouraging is that we see them reacting to flows. We see the USGS doing some studies on the substrate over the years, on changes in substrate since we started the environmental flows.

Mike Montagne [00:53:12] So we have some good guesses. We use the best available science to us back when we, I say "we", it's such a big group. We were deciding on these flows. Amazingly, this group of people that are coming together are the Army Corps of Engineers, the EPA, the U.S. Fish and Wildlife Service, USGS, State Departments, TPWD, TCEQ, the Louisiana Department of Wildlife and Fisheries. We have the Northeast Texas Municipal Water District, the city of Jefferson, Marshall, and certain NGOs like the Caddo Lake Institute and the Nature Conservancy. And just countless other organizations who got together in the first place to develop these environmental flows and who have garnered all this public support for this area to do this.

Mike Montagne [00:54:09] Like I mentioned, this is all voluntary here. No one is being forced to do it like in a lot of places. And I see this group of people coming together and really work and try to contribute the best science that we can to make these, these environmental flows that we can now test through things like paddlefish. We're also testing things like what's happening in these flooded bottom lands. What kind of trees are changing? What kind of vegetation is changing? There's so much that goes on is that it's not just about fish. It's about the whole ecosystem and the whole watershed, really. So these environmental flows that we're implementing, we're learning things and how they affect both the flooded bottom lands and the hardwood forest there, the cypress trees that are there. We're seeing what they do to the aquatic invasive species that are there, the giant salvinia, which is an issue out there.

Mike Montagne [00:55:02] But the environmental flows are, have the potential to affect the whole watershed. And that's, that's really the key thing, that paddlefish are really just a small component of it. We're measuring what's happening to the fish community and the paddlefish are kind of a surrogate species for that, kind of the focal species that everybody can see. And that's what the important thing to remember about the flows is that it's a system-wide recommendation, not just to do with the fish.

David Todd [00:55:32] And if I'm understanding this, the flows are not changing in the aggregate. It's the timing and the amount, the seasonality of the flows. Is that right?

Mike Montagne [00:55:43] That's correct. Yeah. If, we would like to see big pulses in the spring, because that's the normal, as I said, that's the historical hydrograph of the system. And luckily, the historical hydrograph of the system was recorded and we have an idea of what that looks like. And so now what we're doing is we are trying to mimic that. So we want flooding flows occasionally that go in and flood these bottomlands and create these nursery habitats and recreate that connectivity to the river. We want the pulse flows that clean off the spawning shoals. We want the low and minimum flows to make sure that there's plenty of connectivity and that fish can always move back and forth and that it doesn't change, and say, for example, the temperature or the water chemistry. It's not just about getting a pulse or a

high flow. It's actually minimum flows. There's so much involved with - we wanted to transport seeds. We wanted to transport sediment. So that all has a certain magnitude of flow that we need to do all those things that we're learning as time goes by so that we can tweak those environmental flows as we need to and make things better for as much of the ecosystem as we can, not just, say, paddlefish.

David Todd [00:57:01] That's fascinating. Well, we talked a good deal about the flows and how they affect paddlefish. I was wondering if you could talk about any other factors, I've heard of at least, that affect paddlefish survival: things like boat collisions and old oil and gas activity, getting entangled in gillnets, snagged on treble hooks, chemical runoff. Are any of those significant in your view?

Mike Montagne [00:57:38] I think they they're an additive factor. Certainly Caddo Lake and the Big Cypress Bayou are heavy on recreation. But some of the things we learned, learned back in college that a lot of things are additive. So they're not necessary. Well, they're not necessarily additive, that they actually work to keep the population in check. They're not necessarily going to make it any worse, because you're always going to have some of that: deer get hit by car. Nothing you can do about it. There's hunting of those, of those species as well. And it's not necessarily knocking, it's not necessarily going to, if you do it responsibly and it's kept in check to a reasonable degree, you're not necessarily impacting that species. You are, you're impacting those individuals, but you're not really impacting the species as a whole.

Mike Montagne [00:58:27] So while there's a lot of things on there, and if you go out in Caddo Lake, you will obviously see a lot of oil and gas industry going on out there. It's unavoidable. If you head up into James's Bayou, if you don't watch where you're going, you're going to run smack into an oil derrick. So it's out there. It's, it certainly has the potential to pollute or things like that. But to this point, I don't know that it's a major impact on them. And it's always going to be there. It's always going to be a factor. But I don't think that that's one of the things that's actually affecting their return back into the system.

David Todd [00:59:06] So it sounds like your efforts to restore the paddlefish have not only been aimed at paddlefish themselves, but they've also had a kind of educational component. It sounds like you've had a lot of public engagement and involvement with kids in schools. Can you talk a little bit about that part of it?

Mike Montagne [00:59:29] Sure, you bet. Yeah. You know, it's funny because, you know, if you see a paddlefish, like I said, you never forget how it looks, it's unmistakable. And when I first started this, I was, I kind of would jokingly lament, well, this is no wolf, you know. No one's gonna go, "Look what a pretty wolf, or a bald eagle. How majestic!" They're going to look at it and go, "Really, you're trying to save that?" But it has actually been the exact opposite. It's so, it's so ugly that it's suddenly the, the darling of everybody when they see one and get to handle it, because they're just so awkward looking and unmistakable. And one of the things that that's done is it's really got us a lot of attention in that area. And besides, besides the Web site I told you about where we, where these people can sponsor fish and track them through the system.

Mike Montagne [01:00:17] We also worked with a lot of different organizations to get kids involved in the whole thing. And one of those institutions is the Collins Institute in Jefferson, Texas. They work with all the local schools and they get kids involved in ecological projects so they know what's going on in the environment around them and a lot of historical restoration

as well. And they go around and they do countless environmental projects, restoration - put in a river walk right there in downtown Jefferson. They go through and remove invasive species. They're constantly going out and getting involved in some of these projects all around there.

Mike Montagne [01:01:01] One of the things we've been trying to do with the Collins Academy that we've, it's been slow to implement because we've had some projects slow to develop, is we have one oxbow reconnection project that we use National Fish Passage Project money for to reconnect the oxbow at certain, at certain flows coming out of the river and then fill up with water and then the water recedes. Whatever's in there is in there. And one of the things that we want to do, and have yet to do, is stock some paddlefish larvae into those backwaters and then track their growth and how they're doing in that, in that flooded bottom, in that oxbow area. We wanted the local kids to go in and actually do that work so they'd be in there, hands-on, catching the fish, measuring the fish, releasing the fish, taking water quality samples and all that kind of stuff to kind of help us keep track - kind of citizen scientists, if you will, in the Jefferson area.

Mike Montagne [01:02:03] Because my office is in San Marcos, Texas. And so I'm a good five-hour drive away for everything. So to have some local organizations and kids doing some work for us is great. Get them involved and keeps, it keeps the whole community involved. Every time we go in there and we stock fish, we have huge crowds. They advertise in the local papers and on TV. And then we get press out there and there's news cameras and we're doing interviews and they're showing kids releasing fish. That's one of the things we like to do when we're releasing fish and stocking fish because we let everybody know. And then the community comes out and we allow them to stock the fish by hand. And that gives them that hands-on with the fish, actually get to hold it, and really look at it and they get to see how special and unique that fish is. And it's, it's been an incredible response to the point where we've been doing it for long enough now, people see me and they're like, hey, the paddlefish guy, the paddlefish guy. So it's really kind of cool that we get that kind of reaction out there to a species of fish that I thought only a mom could love, you know?

Mike Montagne [01:03:15] Well, and so maybe to start wrapping up with you today. When you talk to these students or to the moms and adults, what do you tell them about why it's important to protect and restore the paddlefish?

Mike Montagne [01:03:35] Well, I tell them, of course, while the paddlefish is kind of the poster child for it all, that it's just, it's just a, it's a symbol of what's going on out there. It's the changes that are being made that we can potentially reverse that are going to continue to be made and we're going to lose things. We start losing things. You know, you don't want ... once something's gone, you don't get to bring it back. And once it's gone, it's gone. And the paddlefish, it gives it a face that shows people that these are things that are happening out there. I mentioned the bluehead minnow before, and it's, it's also in trouble out there. And we don't see very many of them anymore. But it doesn't quite have the shine that the paddlefish has on it, which is kind of amazing. And so you can kind of, you can kind of tell people while we're taking this paddlefish, hopefully at the same time we're saving a lot of different things. Even not fish. We're saving potentially the cypress forest that's there. We're saving species of mussels that are out there, that are becoming endangered. More and more people are starting to watch and notice the decline of. And so when we start messing with the environment and you mess with a lot of things and it's a lot of it's not very easy to see, especially when it's below the waterline. But the paddlefish in their hands and is what gives the people that connection, that there are things that are going on that they can't see, that they, that we're in not necessarily in control of, but have an opportunity to change for the better. And so that

kind of that helps us out and gets people thinking about the bigger picture. And you know, whenever I talk about endangered species in the environment, I start talking, I tend to mention, like a clockmaker, you know, you can only take so many pieces out of that clock before it just doesn't run anymore and then it's just kind of useless. So I try to keep it in terms of, you know, you once you lose it, it's gone. And it doesn't mean you can just once it's gone and you realize it's gone, doesn't necessarily mean you can just stick it back and it's going to be OK again.

David Todd [01:05:43] I see, so you're even if you just did the, these reintroductions without maybe working on the shoals or changing the flow regime, you might not have a successful recovery because there's so many pieces to their life history.

Mike Montagne [01:06:00] That's correct. One of the things that my office also was doing is we were also leading the reintroduction effort of the Rio Grande silvery minnow into the Rio Grande in Texas. And one of the things that I, the project I kind of inherited, but one of the things that was going on there is we just started dumping literally millions of the Rio Grande silvery minnow back into the river without doing any of this pre-work that they've done on the Big Cypress. There was no environmental flows coming down. We were going through these droughts where the river would dry up in long sections and we didn't have any kind of environmental flow or cooperation with Mexico. And for 10 years, we continued putting those fish in there with such small returns that much like the early paddlefish effort that was given us zero returns, at some point, we said this is just not economically feasible to keep doing this and we're not making any headway. So we need to stop. So just chucking fish back in there was never going to do it.

Mike Montagne [01:07:05] You had to have some sort of, you know, they go extinct or they're going extinct or disappearing for a reason. If you don't address that reason, you're just temporarily throwing them back in there like a zoo for people to go, "we have them in there". But eventually they're going to be gone. And so you have to do that legwork, which is all that flow work and the habitat restoration. Without all of that, just throwing fish back in there is never going to make them come back. I've seen that time and time again in fisheries throughout the United States, as we try to throw fish back in without doing any work. And it's, it ends up not being fruitful. And we have to go back to the beginning and it all comes back to flows. You're seeing a lot of dams being removed in the Pacific Northwest and in the East and Northeast. And we're starting to see returns from that. We've started to see the salmon come back. You're starting to see the fish communities change back to what they were. But it's a long, slow process and it's, it's painful. Everybody wants to just throw the fish back in. And that seems easy, but it rarely works that way.

Mike Montagne [01:08:12] This is really interesting. I mean, the combination of of research and cooperation and interventions and a lot of patience, it's really sort of striking. Well, let me just ask you to close. Is there anything you would like to add about what you've learned from this experience with the paddlefish?

Mike Montagne [01:08:37] Sure. Well, one thing I want to talk about is just that I failed to mention in here, I get excited and I start talking about different things. Is that back in, because of the early success that we've had and the continued support that we've received from the community and all the entities involved, in 2018, we actually implemented a 10-year paddlefish-stocking plan. And what we're doing there is we're taking broodstock from the Red River up in north Texas and Oklahoma border. We bring those fish up to Tishomingo National Fish Hatchery and they spawn them up there. And they are now giving us about between 10

and 15,000 12-inch paddlefish every year to stocking the Big Cypress. So over 10 years, that's going to give us 120,000 paddlefish produced by Tishomingo National Fish Hatchery and put them into that system for us to follow.

Mike Montagne [01:09:36] Now we're using what is called the MICRA guidelines, which is the Mississippi Interstate Cooperative Resources Association, who work with paddlefish throughout the United States. And they've come up with a bunch of guidelines to help paddlefish, paddlefish production and restoration and efforts that throughout the United States. They give everybody kind of the best guidelines to follow. And we're following all those guidelines, using for genetics and for number of stocks, for tagging all those fish and for reporting all that so there can be a national database on paddlefish. And so we're doing that.

Mike Montagne [01:10:15] And what that's going to give us is actually fish in the system that we can start to study. I mentioned, you know, the ones that we've stocked in there through the years. We've stocked more, but only kind of randomly until 2018, where we're now we're starting to stock real numbers of fish in there that we can start to study. And as time goes by, we're going to have more and more of those reaching adult, adulthood so that we can start tagging them, seeing where they're going and actually have a population in there to study without, you know, before we started putting fish in there, there was nothing to study. There was no paddle fish to catch, no paddle fish to watch. What it took was actually getting some fish back into that system so we could start watching what they're doing. And so that's kind of a key because there were none to study. Now we've start we're starting to get some real numbers of paddlefish that we can actually work with in there.

David Todd [01:11:08] That's fascinating. It's like a sort of a stitching project where, you know, you you have to in real time both introduce these fish and then study them and then that influences how you do your next introduction, you know, next stitch.

Mike Montagne [01:11:23] Absolutely. Absolutely. But we can always study what's out there. And so in the beginning, we just had a few juvenile fish that we kind of watched. Now we're getting some that are just starting to reach adulthood. We're wanting to try to stock some of these younger life cycle or life history or life, some of these younger aged fish to watch what they're doing as well, because we really don't know where the break in the life cycle is. It could be that these spawning areas never allow the fish to spawn. It could be that the eggs never hatch. It could be that the larva didn't survive. There's so many different things that we still don't know. And so we've had, we're doing a lot of stuff. And people always ask me how successful is, how successful are they doing? And I, I kind of hedge it. And then I go, well, we don't really know yet. We're still figuring that out. The early stuff is encouraging, but until we see what those fish are doing in terms of reproduction and recruiting into their population, we really are just watching what juveniles will do in that system, which is a lot of time just eating and finding places to eat and adequate other habitat routes. And so whether it's successful is still very much up in the air still, because if they're not reproducing and recruiting in that population, we're just sticking fish in there for a period of time and then they're going to disappear again. So we're actually doing things to kind of feed future research by putting these fish in there, now, is that these fish in 10 years, we're going to really get by. In 10 years, we'll have a lot more information. It'll be funny because I've been with the Fish and Wildlife Service now for 26 years, and it's probably going to be other biologists who end up seeing the end of this project and determining whether it's successful or not.

David Todd [01:13:18] Well, I wish you well and your successor biologists. It's great to see this kind of long- term commitment. I guess that's what it takes. Well, thank you so much, Mike. I really appreciate your time and wish again, wish you all the best.

Mike Montagne [01:13:38] OK. Well, I appreciate you listening to the story. A lot of people need to hear it because it's pretty interesting for sure.

David Todd [01:13:45] It is, it is. Thank you so much for sharing it. Appreciate it.

Mike Montagne [01:13:48] You bet. Talk to you soon.

David Todd [01:13:49] All right. Bye, Mike.

Mike Montagne [01:13:49] Bye bye.