

TRANSCRIPT

INTERVIEWEE: Tim Birdsong

INTERVIEWER: David Todd

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David Todd [00:00:01] Well, good afternoon, David Todd here. And I have the privilege of being here with Tim Birdsong. And we plan on recording this interview for research and educational work on behalf of the Conservation History Association of Texas, which is a small nonprofit here in the state. And this is also related to a book and a website for Texas A&M University Press, and for an archive at the Briscoe Center for American History, which is at the University of Texas at Austin.

David Todd [00:00:36] And I always want to stress that this recording is really for your use as well. So if there's any application that you have in mind, have at it.

David Todd [00:00:51] And before going any further, I wanted to make sure that that's a good arrangement for you and if that's agreeable.

Tim Birdsong [00:00:58] Yes.

David Todd [00:00:59] All right. Well, let's get started.

David Todd [00:01:01] It is Tuesday, June 27th, 2023. It is about 2:50 p.m., Central Time.

David Todd [00:01:10] My name, as I said, is David Todd. I am representing the Conservation History Association of Texas, and I am in Austin.

David Todd [00:01:18] We are conducting a remote audio interview with Tim Birdsong, who is also based in the Austin, Texas area.

David Todd [00:01:27] So, Mr. Birdsong has been at Texas Parks and Wildlife for almost 17 years. His work there focuses on conservation of fish and aquatic resources. He currently serves as deputy director of the Inland Fisheries Division, as well as program manager of the Texas Native Fish Conservation Areas Network. And for the past 14 years and more, he has managed the Guadalupe Bass Restoration Initiative.

David Todd [00:01:59] Today, we'll talk about Mr. Birdsong, his life and career so far, more to come, and especially focus on what he has learned about the history of Guadalupe bass and their study and their restoration.

David Todd [00:02:12] So, let me ask a first question.

David Todd [00:02:16] Could you please tell us about your childhood or early years and if there might have been people or events or some kind of experience then that influenced your interest in nature and in fish in particular?

Tim Birdsong [00:02:30] Yeah, sure. So I was born in Denison, Texas, near Lake Texoma, in the Red River Basin, and had parents who were teachers, school administrators, coaches, extended family that were mostly teachers, coaches. And back in the days when teachers had summers off, we would spend most of our summers camping and fishing and paddling. And I remember lots of fishing trips on southeast Oklahoma reservoirs, several that were newly constructed at the time. So, they were experiencing those kinds of new reservoir effect - you know, the high nutrient levels, hyper productivity, fish were growing fast, lots of fish to catch. And so fishing was really easy at places like McGee Creek Reservoir and there were, you know, if you go to a reservoir, a number of other impoundments on tributaries of the Red River.

Tim Birdsong [00:03:35] And then my parents, we spent a good amount of time at my grandparents' place, which was a farm that abutted Army Corps of Engineers land on Lake Texoma. So, we had easy access to the lake for fishing and swimming and did some camping out there. And I just kind of spent most of my childhood summers on the lake and really year-round we spent a good amount of time just experiencing nature in the outdoors.

Tim Birdsong [00:04:07] And my dad was a serious angler and tournament angler. And I had an uncle that was a tournament angler and wrote for a prominent fishing magazine and organized a fishing tournament circuit. And I just, I got exposure to fishing and lakes and both, you know, the enjoyment of being just an outdoorsman who understood how to catch all species of fish. But then also that aspect of kind of the competitive angling, which probably led me down another career path that I temporarily experienced.

Tim Birdsong [00:04:54] So, after, you know, after college, I was drafted by the Cincinnati Reds to play professional baseball. So I was, I was already very much interested in pursuing a career in fish and wildlife conservation and was in my junior year of studies in that, at my undergraduate college. But I played college baseball while I was studying to be a fish and wildlife biologist. And then I was, like I said, drafted at the end of my junior year. And I just thought, "Well, I really need to give this baseball thing a shot." And it was, I can remember as early as, you know, sixth, seventh, eighth grade, just dreaming of playing specifically for the Cincinnati Reds. So it was a unique opportunity that I had. And I thought, "Well, I, I need to pursue that, see what comes of it."

Tim Birdsong [00:05:52] Meanwhile, I had an internship with the Wildlife Department in Oklahoma, which was, continues to be kind of a gateway. These internships are really competitive with state fish and wildlife agencies, and it's kind of a gateway into a full-time career. So, just getting that internship and starting to build that network and, you know, it was likely going to open some doors.

Tim Birdsong [00:06:14] So when I when I had to step into the manager's office and let him know that I was needing to resign my internship, it was really surprising to them that I would choose professional baseball over this internship, and that, it kind of signals how serious most folks are in the fish and wildlife profession are about this field. They're just so passionate about it. It's really difficult to wrap your head around choices that anyone in our career field would make to step away from this work and pursue something else. And it's pretty rare that it happens because once you're committed to a career in fish and wildlife conservation, you often stick with it.

Tim Birdsong [00:07:01] But so I pursued the professional baseball career for just four seasons. And I realized that I, the life living out of hotels and being away from family for nine months out of the year. And, you know, I was, I'm still married to the same person, but I'm

married to my wife for the last two of those four seasons. And to be married in December and then to leave for spring training in February, return briefly in September and then go play in a fall league, and just the first year of marriage, only living together for a couple of months. I just, I realized that it wasn't real conducive to family life and probably never would be.

Tim Birdsong [00:07:50] And as much as I enjoyed playing baseball, I love being with my family and wanted to pursue this career in fish and wildlife conservation even more. So, I gave up baseball and then I went back, finished my undergrad, and then I pursued a master's degree, a graduate degree at Louisiana State University.

Tim Birdsong [00:08:14] But, yeah, along the way, just growing up on the shores of Lake Texoma, I always just had this interest in, you know, where, is this natural or is this man-made? Is this, where is this water coming from? What rivers, streams are being impounded? Where does this go? When I see water move through this dam, presumably for hydropower generation, maybe for downstream water supply, where does this water go? Who are the downstream users?

Tim Birdsong [00:08:45] And then I you know, I started to learn about those connections from the, you know, the Red River to the Mississippi, to the Gulf. And then that really got cemented when I went to LSU and I spent quite a bit of my graduate work focused on estuaries and kind of the, you know, the river / bay interface and looking at the impact that sediment transport and flows has on replenishing coastal wetlands and replenishing, you know, maintaining those habitat features that are important for all sorts of recreationally and commercially important species that I enjoyed targeting as an angler.

Tim Birdsong [00:09:33] But, you know, you just, you start to see the connections from, you know, the Panhandle of Texas and western Oklahoma to, you know, to the Gulf of Mexico. And I was just fascinated by watersheds and landscapes and kind of the big picture of, you know, limnology, river ecology, hydrology. And so I focused in on graduate studies and coastal restoration that kind of brought all those pieces together.

Tim Birdsong [00:10:06] And I'm definitely interested in the animals, but I've spent most of my career more focused on their habitats, and how can we restore and conserve natural landscapes and riverscapes and watersheds to benefit the health of these flowing systems and the species that rely on those and provide benefits to humans, whether that's flood control or water supply or recreation or you name it. So, it kind of brings all those pieces together.

Tim Birdsong [00:10:39] And so, that's kind of where I how I got to where I am in this career field.

Tim Birdsong [00:10:47] I guess before I ended up at Texas Parks and Wildlife, after I finished up my graduate work at LSU, there were some opportunities to work on coastal habitat, marine habitat, through the National Oceanic and Atmospheric Administration, the Magnuson Stevens Fishery Management Act, had just been passed by Congress, and they had mandated that essential fish habitats be characterized. And so, my master's work at LSU was characterizing essential fish habitat for a subset of commercially and recreationally important species.

Tim Birdsong [00:11:30] And then, there was an opportunity to move into a role with the National Oceanic and Atmospheric Administration to continue that mapping of essential fish habitat. So I did habitat mapping in coastal Louisiana and then went to work in Maryland for

NOAA and worked on the eastern seaboard - so, mostly focused around the area from North Carolina, Cape Hatteras, down to peninsular Florida, and just mapping these important habitat features off the East coast with the idea that we would have this information on important habitats to try to prevent damage to those from deepwater, whether it's deepwater bottom trawling or energy exploration or cable laying or other sorts of practices that might damage those fish habitats before they could be zoned and protected.

Tim Birdsong [00:12:33] So, so worked with a group to conduct, it was roughly a dozen research cruises. I wasn't involved in all of the cruises, but I was involved in kind of bringing together all of the data across this set of cruises. And we're talking about, you know, each of those being roughly a month-long mapping cruise off of the East Coast, but literally millions of acres of underwater habitat that was mapped.

Tim Birdsong [00:13:01] And then worked with the South Atlantic Fishery Management Council to zone those areas for protection to prevent destructive practices. And most of these areas that were mapped, these were deepwater corals. So, you know, folks were familiar with more shallow water corals, but there are these deepwater corals that also grow on hard substrates. And so, if you think of Devil's Tower in the West or just this massive, you know, just 100-meter, 300-meter kind of tower that juts up from the seabed, and there was hard substrate at some point in time where these deep water corals attached. And then you have the Gulf Stream currents that move throughout the Gulf and around peninsular Florida and up the east coast and then across the North Atlantic.

Tim Birdsong [00:13:54] And so there's this nutrient sediment that would just be trapped in this coral matrix. And then, you just have more coral that continues to build. And over time, you have this tower that forms. And there were literally hundreds of these kind of tower-type features that are off the East Coast and that provide really important habitat for crabs and fish and other taxa. And so they're just these islands of life in the Gulf Stream current.

Tim Birdsong [00:14:24] And so, you know, any sort of, like you can imagine, a bottom trawl that could come through and just knock off the top of this tower and you would lose all the live coral and the important structure that's there for fish.

Tim Birdsong [00:14:40] And so, we tried to get out ahead of some of those destructive practices by documenting these areas and setting them aside with protection by the, our Fishery Management Council in the region.

Tim Birdsong [00:14:56] So, I worked on that sort of habitat work at, you know, in marine and coastal systems. Some of that work was done in the Gulf as well.

Tim Birdsong [00:15:07] But so my wife and I had our youngest child when we lived in Maryland and really had this pull to get back to Texas and Oklahoma, where most of our family are from, and had really expected to have a career with NOAA. Really loved the agency, had a lot of respect for that agency.

Tim Birdsong [00:15:32] But, you know, started looking around at opportunities. Knew very little about Texas Parks and Wildlife Department. That was almost 17 years ago. But there was a position that was coming open. And it turned out that the person that was in the position (it was kind of a federal-state liaison, it was working on the state side of some joint state-federal programs that I was involved in on the federal side), and so this person was retiring from Texas Parks and Wildlife Department after roughly 40 years.

Tim Birdsong [00:16:05] And so, it was kind of a, it was real, real timely that I had some encouragement from my wife to just, hey, can you look one more time back in Oklahoma and Texas, before we pull the trigger on buying a house we can't afford in the Washington, D.C. area?

Tim Birdsong [00:16:23] And so, I looked and just this window of time, this, really, like probably a two or three week job posting that I saw. And I'm like, "All right, I know how to do that. That's what I've been doing as a as a federal biologist."

Tim Birdsong [00:16:40] And so, I applied for that. I overlapped with that person, Nick Carter. Nick was at one time the fish chief for Texas. He was the research director for the fisheries programs in Texas, and at that time was in this federal / state liaison role, kind of end of his career, something that he really enjoyed. And so, he took me through the, you know, just kind of learning the ropes, so to speak. And I was in that role for just over a year.

Tim Birdsong [00:17:16] And then they had a role for as the chief of habitat conservation that came open. And that was something I really cared about and that was timely as well in that Dave Sager was the branch chief prior to that. And he had spent a 30-plus year career at Texas Parks and Wildlife, and so, the kind of the one of the earliest baby boomers to move on into retirement. And so, I applied for that opening and, yeah, moved into that role and I was in that role from, I guess it was 2008, until just a little over a year ago.

Tim Birdsong [00:18:01] And then, I was promoted to deputy director and still work on many of the same programs. My roles haven't changed dramatically since I moved into the deputy director role. But, yes, the passions that I had for habitat conservation, and interest in interest in working at kind of watershed scales that really came together. I was able to really focus energies around trying to build out some programs and initiatives to make that happen in different regions around the state. And a lot of colleagues who are passionate about building the kinds of partnerships and funding mechanisms and, you know, all the kind of moving parts that come with trying to build a watershed initiative to conserve, to implement large-scale conservation of rivers and streams and implement range-wide conservation of aquatic species.

Tim Birdsong [00:18:55] That, you know, to implement something like that in a private land state, it takes a unique set of tools, many of which we did not have in Texas when I came into that program. So, some of the things that we did, that we did early on, back in the '07-08-09 time frame, and this was very much a team approach - there were a lot of other folks that were involved in this. But, it was a pleasure to work with them and building out some initiatives.

Tim Birdsong [00:19:26] One of those was adapting to what was, what is still referred to as the Landowner Incentive Program. So, Texas Parks and Wildlife during the George W. Bush administration, was the recipient of federal funds to establish this Landowner Incentive Program that would provide cost-share funding to landowners to restore grasslands and riparian areas and other important habitats, mostly focused around terrestrial wildlife.

Tim Birdsong [00:19:56] And then, I guess it was during the Obama administration, that program, the funding dried up. And so the agency needed to decide whether we were going to continue to implement that program, employ the staff in the Wildlife Division of our agency

that were dedicated to that. And without funding, they were really looking for dollars to put toward restoration projects that would be administered by the program.

Tim Birdsong [00:20:23] And we had this really incredible opportunity that came up where the National Fish and Wildlife Foundation said, "Hey, we would really like to see some initiatives built in the southern U.S. to focus around conservation of rivers and streams." And it was actually the idea that the National Fish and Wildlife Foundation brought to the Texas Parks Wildlife Department and sister agencies in the South that maybe you could use these charismatic riverine native black basses to grow some interest in river conservation, because we don't have salmon, we don't have native trout, we don't have these charismatic species that are available in the Western U.S. We don't have you know, we don't have Gulf run striped bass, we don't have striped bass or American shad swimming up our rivers like the East Coast. There's just not these big charismatic species that we can hold up as being keystones or representative of these riverine systems.

Tim Birdsong [00:21:33] So we said, "Well, you know, could Guadalupe bass be that for Texas?"

Tim Birdsong [00:21:40] And so, Guadalupe bass, this is our official state fish. It was named our state fish back in the late eighties. And there had been some early efforts in the, you know, in the late eighties, early nineties, to try to restore Guadalupe bass to its namesake, Guadalupe River. So it's a species that's found in the San Antonio, Guadalupe, Colorado and Brazos River basins or at least select tributaries that flow in those basins. But it's not found statewide. It's just found primarily in central Texas and portions of the Hill Country, mostly in these clear spring-fed karst systems, these just iconic Hill Country streams. And so, the species was found there. And it was something that's, it's really unique to Texas.

Tim Birdsong [00:22:40] But meanwhile, there are almost 20 different unique forms of riverine black basses that are found across the southern U.S.. So there are species like shoal bass that are found in real similar spring-fed streams in Georgia and Alabama and panhandle Florida. There's a Suwannee bass that's found in the Suwannee River, the redeye bass that are found in some streams in the mountains of South Carolina. You have quatro cienegas bass, which is found in these desert wetlands, this closed system in Mexico.

Tim Birdsong [00:23:23] And then, we had another unique form of bass in Texas that we refer to as Devil's River bass, Rio Grande largemouth bass. It's, there are several names. It hasn't been formally described, but it's considered a, it was considered a subspecies of largemouth. It was morphologically different from largemouth bass that most people think of it. It had a tooth patch, it had some other characteristics that were different than largemouth bass. And it was found throughout the Rio Grande Basin. And it's thought that it also occurred in the Nueces Basin and it's still found in the Devil's River.

Tim Birdsong [00:24:05] We don't know of anywhere else that it still occurs. And we've talked about trying to conduct a range-wide assessment and see where we still may have populations of this species possibly in Rio Grande tributaries in Mexico, or possibly places like the lower Pecos. There are some areas that are still doing pretty well and that it could still persist. But we don't have a good handle on that right now.

Tim Birdsong [00:24:33] So again, roughly 20 different unique forms of bass that are found around the southern U.S. So the National Fish Wildlife Foundation said, "Could you hold up these riverine black basses as what they referred to as "keystone species"?"

Tim Birdsong [00:24:49] So, they're representative of all the aquatic life and potentially, you know, other life, other animals that are found in floodplains and riparian areas or in a watershed.

Tim Birdsong [00:25:06] Could we build out a conservation plan for a species like Guadalupe bass that's found throughout central Texas, and with the kinds of actions that you would implement to conserve habitat for Guadalupe bass and try to restore and preserve Guadalupe bass populations, you know, could you do that in a way that also benefits freshwater mussels, do it in a way that also benefits to the diversity of of freshwater fishes that are found in those systems?

Tim Birdsong [00:25:34] Could you do it in a way that it benefits things I mentioned earlier with flood abatement and water supply? And, you know, if what you're doing to benefit Guadalupe bass in the Pedernales or the Llano, you know, if those actions benefit Guadalupe bass, would they also benefit downstream water supply for the City of Austin, for example?

Tim Birdsong [00:25:55] So, could this species be this animal to generate excitement, enthusiasm, interest in conservation of riverscapes and watersheds in central Texas?

Tim Birdsong [00:26:10] And we said that that sounds very promising and we would like to explore that.

Tim Birdsong [00:26:16] And so, up until that point, most of our work to conserve Guadalupe bass had centered around just trying to address this hybridization issue between Guadalupe bass and non-native smallmouth bass.

Tim Birdsong [00:26:31] So, smallmouth bass were stocked throughout central Texas back in the late seventies and into the early eighties to provide another sport fishing opportunity. The streams that are found in central Texas are similar to streams that smallmouth do pretty well in in the upper Midwest and in other areas where they're native.

Tim Birdsong [00:26:54] And so, our biologists back in that timeframe had no idea that, Guadalupe bass and smallmouth bass would hybridize, but they did. And so, when they started to hybridize or Guadalupe bass are potentially out-competed by smallmouth bass, then you no longer have Guadalupe bass in some of those systems.

Tim Birdsong [00:27:16] So, we had situations where Guadalupe bass were extirpated from certain systems, they were completely lost from certain streams where smallmouth had been stocked. The Blanco River was one example: in portions of the Blanco River, Guadalupe bass were gone and you'd see smallmouth and some hybrids that would persist. And we had a number of other streams around central Texas that you could not find Guadalupe bass in any longer.

Tim Birdsong [00:27:46] So, it was, in part, this hybridization with smallmouth, but there were also issues with just flow alterations from surface water withdrawals, groundwater pumping and reduced spring discharge, reduced river flows, dam building - just whether low-head dams or culvert crossings. All of these sorts of things impact the life cycle of Guadalupe bass.

Tim Birdsong [00:28:10] So, we've seen reductions or loss of Guadalupe bass in certain areas of their historic range.

Tim Birdsong [00:28:19] But again, the effort from the late eighties to roughly 2010 was to make sure that Guadalupe bass held on in the namesake Guadalupe River.

Tim Birdsong [00:28:31] So, you know, millions of Guadalupe bass were stocked by Texas Parks and Wildlife Department in the nineties and early 2000s to try to keep that namesake river full of Guadalupe bass.

Tim Birdsong [00:28:49] And it's been really difficult because you still had a source of smallmouth bass in downstream reaches into Canyon Lake. So, Canyon Lake supports smallmouth bass and it would be difficult - it would be really challenging, if not completely impossible, to eradicate smallmouth bass from Canyon Lake. And it's become a popular sport fishery.

Tim Birdsong [00:29:15] But it's a source of hybrid fish. So, the likelihood of a full basin restoration of Guadalupe bass is you know, it's been ... the effort has been ongoing now for over 30 years with limited levels of success.

Tim Birdsong [00:29:37] But, meanwhile we've identified 28 different creeks and rivers throughout central Texas where we believe there's an opportunity to restore and conserve Guadalupe bass. So we've broken up our restoration planning into these tributary, creek, you know, river-specific areas.

Tim Birdsong [00:30:05] And so, of the 28 places that we believe we can restore and conserve Guadalupe bass, 15 of those, we've now implemented conservation measures to either invest in conservation of their habitat, where we think that there's a good chance that they will persist into the future, or where we've done a combination of habitat improvements and reintroduction through stockings or we've conducted stockings to try to basically overpower the smallmouth hybrids that persist in the system, kind of a genetic swamping effort where we just flood the system with way more fish than the system can support. And the hope is that if we just, if we stock enough fish in the system, that the ones that will survive will be the ones that we stock.

Tim Birdsong [00:30:57] And there is some careful planning there to ensure we don't create genetic bottlenecks or other sorts of issues with our stocking programs.

Tim Birdsong [00:31:05] But, you know, we have 15 populations, 15 different creeks, where we have Guadalupe bass populations in Central Texas.

Tim Birdsong [00:31:16] But anyway, back to the National Fish Wildlife Foundation. So, when they had reached out in 2010, they said we would like to use Guadalupe bass and these other black basses that I mentioned - shoal bass, red-eyes, quatro cienegas - as these charismatic keystone species.

Tim Birdsong [00:31:35] And we bought into that and developed a ten-year conservation plan that lasted from 2010 to 2020. And with that, money began to flow from NFWF, from National Fish and Wildlife Foundation, to support these large-scale conservation efforts.

Tim Birdsong [00:31:55] And I had mentioned the Landowner Incentive Program. Well, that program was in need of money. So, we started pushing these fisheries dollars through what was historically a wildlife, kind of a terrestrial wildlife focused program. It was a program that was focused on restoring habitat for turkey and quail and deer.

Tim Birdsong [00:32:17] And now it's moving money to landowners to restore creeks and springs and riparian areas. And so it became a program that has since 2010 been real focused on aquatic systems.

Tim Birdsong [00:32:32] And we're still supporting grasslands restoration and other projects like that, but grasslands restoration in places where it may support aquifer recharge or, you know, there's typically some sort of aquatic connection to the work that's being done, even if it's in upland. So it's very much a watershed approach.

Tim Birdsong [00:32:54] And then, we've added other programs since then. And so the Texas Farm and Ranch Lands Conservation Program was another incentive program for landowners that was started to fund conservation easements. So, we created scoring criteria where a good number of the points awarded to applications for conservation easements were awarded to projects that occur within areas that help conserve native fishes.

Tim Birdsong [00:33:25] And so, you mentioned earlier that I coordinate this Texas Native Fish Conservation Areas Network. So, this is a network of 20 focal watersheds around the state. And a subset of those are set aside as priority watersheds for conserving Guadalupe bass.

Tim Birdsong [00:33:41] But then we have other watersheds that are prioritized to conserve other species like paddlefish or some of our other native species in West Texas, like Pecos pupfish for instance, or Conchos pupfish.

Tim Birdsong [00:34:00] Anyway, we've got 89 of these species that we consider species of greatest conservation need. They're considered imperiled, and they need significant conservation investments to prevent their potential extinction at some point in the future.

Tim Birdsong [00:34:17] And so, 89 of the 191 species that are native to Texas, 191 native freshwater fishes in Texas, 89 are considered somewhat imperiled. And so these 24 watersheds are places that if we take care of those watersheds, then we would theoretically preserve freshwater fish diversity in Texas. And so that's the goal.

Tim Birdsong [00:34:43] But, but, anyway, so we started pushing money out through this conservation easement funding program to purchase development rights, to keep ranches intact, keep working lands working, reduce the likelihood that subdivisions or other developments would be built in some of these really sensitive habitats that we're trying to protect. So that was another program.

Tim Birdsong [00:35:08] And then, we've partnered up with some local watershed alliances, river conservancies, landowner networks, to do lots of demonstration projects and field days and landowner workshops and just try to build, build out interest and capacity to do, to implement landscape-scale watershed conservation.

[00:35:35] So, it takes a lot of effort to try to recruit willing landowners and, you know, just empower them, incentivize them, to implement practices that benefit rivers and benefit habitat for species like Guadalupe bass.

Tim Birdsong [00:35:49] But, we've partnered up with this network of organizations and individuals to try to recruit those volunteers and then use these incentive funding programs that I mentioned to provide cost-share support to to have them, you know, implement these projects.

Tim Birdsong [00:36:06] So, we've been doing that since 2010, going on 13 years of supporting large-scale restoration work in places like the Llano and Blanco and Pedernales. And we've done some work in places like the Nueces and Frio and Sabinal. And, you know, We're just continuing across the Hill Country.

Tim Birdsong [00:36:31] Meanwhile, the threats to that whole area, you know, west of the Austin-San Antonio corridor are enormous. So, it's tough to really implement at the scale that's needed to try to keep those places protected in the future.

Tim Birdsong [00:36:47] I know I've, you know, spent the last 16 years living in South Austin and my kids and I have, for that time frame, spent, you know, a good number of our weekends and nights hanging out on Onion Creek. So we have all these different places on Onion Creek that we've swam and fished.

Tim Birdsong [00:37:13] And so, I have these, this, you know, photo documentation that you could probably check out my social media feeds and see from the last 16 years. And I've just, I've watched as development has occurred and the highway 290 corridor from Austin to Dripping Springs. I've watched as development has occurred south of Austin, you know, from Austin to San Antonio. And I've seen the fact that increased groundwater withdrawals has had on spring discharge and flows and streams like Onion Creek.

Tim Birdsong [00:37:50] So, places that I would routinely catch Guadalupe bass with my kids and where I would take my, you know, my dog swimming and where we would spend a lot of time in the summers, places that have, you know, pretty dramatic change in terms of flows.

Tim Birdsong [00:38:08] For folks that are familiar with Onion Creek around Salt Lick - you know, Salt Lick is a famous barbecue restaurant southwest of Austin, and Onion Creek flows right past it. And Camp Ben McCullough is a famous park that's right across from Salt Lick. And so I spent a good number of years there. And I'm just seeing in recent years the de-watering of that stream and loss of flows, loss... There are a number of Guadalupe bass there.

Tim Birdsong [00:38:41] It's not that flows couldn't be restored, but to think about what it would take to make that happen, I just, I don't know how realistic it is for some of these places to recover. And I think to learn from those decisions that have been made. I mean, there's, you can't point a finger at any specific development. It's a collective group of, you know, hundreds of thousands, or millions of new, you know, housing developments and others that are tapping the groundwater.

Tim Birdsong [00:39:24] There's also, you know, there's some implications for changes in rainfall patterns. And so we really can't, you know, there's not a smoking gun, so to speak. But you just see the trends in the decline in the springs and the decline in stream flows and the impact that it has on loss of species like Guadalupe bass.

Tim Birdsong [00:39:53] There are downstream connections. There are some areas where you have deeper water, there are pools that still persist and that serve as refuge for species like Guadalupe bass. So, it's not that Guadalupe bass are gone from Onion Creek, it's that they're relegated to some of these holes, these deeper pools that still persist. And under the right flows, they can, they will move upstream, they'll move upstream, they'll scatter, they'll recolonize. And over time, their populations could be rebuilt.

Tim Birdsong [00:40:28] But the trends that we're seeing are a continued decline in flows for many of these streams in the eastern Hill Country. And I don't know that that's going to change.

Tim Birdsong [00:40:40] So, you start to start to think about, well, what's the likelihood that we can conserve in, you know, some of these streams.

Tim Birdsong [00:40:48] Or are we better off shifting our focus further, further west or maybe to the southern Plateau? Do you look at places like the Nueces or Frio or Sabinal or places that where there is less, less anthropogenic pressure and, you know, less development, less demand, or competing demands, for water and try to shore up some of those areas where there's more of a preservation opportunity.

Tim Birdsong [00:41:15] Can you can you really get in the game on trying to purchase water rights and preserve river flows and some of those sorts of strategies that have been used in the western U.S.?

Tim Birdsong [00:41:26] So, these are things that we're starting to shift into.

Tim Birdsong [00:41:29] And, you know, we've done a fair bit of work in places like the Blanco River as well, which, you know, flows have been trending downward in the Blanco for a while. And places like Cypress Creek where you have this this famous spring - Jacob's Well. First time it had ever gone dry in recorded history was in 2022.

Tim Birdsong [00:41:57] And I drive over Cypress Creek most days on my way to work just within a couple of hundred yards of Jacob's Well, downstream of Jacob's Well, so I get to see what the flows are and you know we've had quite a bit of rain this spring in Texas. But still not a lot of rain in central Texas, not enough rain in the Hill Country, to help refill aquifers that have a big impact on raising aquifer levels and improving spring discharge.

Tim Birdsong [00:42:30] And so you just see a continued trend in low flow conditions in most Hill Country streams which are not great for Guadalupe bass.

Tim Birdsong [00:42:41] So, just the question of, you know, what does the future hold and how can we be strategic, especially in a rapidly developing area of Texas, a rapidly developing area of the nation, and a place that's undergoing some changes, significant changes, in, you know, rainfall patterns? And we're heard a lot about desertification, where you're starting, we're seeing some areas in the Trans-Pecos that were thought of as Chihuahuan Desert. You're seeing that desert kind of slowly creep and expand eastward into the western extent of the range of Guadalupe bass.

Tim Birdsong [00:43:24] And so it's kind of being, it's a, you know, it's a species just kind of being squeezed from desert in the west and human development pressures to the east.

Tim Birdsong [00:43:34] And so, you know, for a species that needs clear, flowing, you know, cool water, kind of spring-fed streams, there's a lot of work that needs to be done.

Tim Birdsong [00:43:49] And the future is, I mean, I'm hopeful, I'm optimistic that we can do something about it. But, you know, beyond my lifetime, I don't know what the future holds for Guadalupe bass.

David Todd [00:44:05] You've covered a lot of ground, both in your life and in your explanation of this. You know, I was hoping that she might be able to sort of wind this back a little bit, because it's always interesting and useful to hear the starting points. And it sounds like you've been in a hurry for a while. And so this may be way, way back. But one of the questions we often ask is whether there were influences on your life that were outside of your, you know, your father and your uncle who sound like they were very interested in fishing and competitive fishing and camping and hiking and so on, and grandparents who offered this place for you to visit. But were there things in the culture at large, you know, books that you read, TV shows you watched, movies you saw, that might have also been influential for you in thinking about nature or fish, some of these issues that have so involved you over the years.

Tim Birdsong [00:45:15] Yeah, it's a good question. I, you know, I'm trying to think beyond kind of influences of family and close friends and, you know, thinking about the broader culture at large. I'll get to that. I don't, I think right now, the immediate was, beyond my father, or my uncles, my grandparents, I just, my dad happened to have a really close friend who was a biologist with the Oklahoma Department of Wildlife Conservation. And so he, I think, if I had not been aware that a career field existed in fish and wildlife conservation, I don't know that I would have thought to pursue it.

Tim Birdsong [00:46:11] I definitely had an interest in wild things, wild places, but I don't know that I would have pursued it. I don't know that I would have been aware or even thought that, okay, this is something that I could pursue in college.

Tim Birdsong [00:46:25] And then, I didn't mention my undergrad school, but Southeast Oklahoma State University, it just so happens that they had a really strong fish and wildlife conservation program. So it's a regional school in southeastern Oklahoma. But they've long had this wildlife conservation program that graduates a lot of future Fish and Wildlife Service, USGS, you know, Oklahoma Wildlife Department employees.

Tim Birdsong [00:46:58] And so, the typical track was to go to Southeastern and get this wildlife conservation degree. And then you could move on and pursue a master's at Oklahoma State, which had a real strong master's program. Southeastern was just starting a master's program.

Tim Birdsong [00:47:20] And so, you know, I think a lot of the opportunity to move into this field was, it was occurring for me within, you know, 15 minutes in my home. I had, you know, this fish and wildlife professional that I had shared a lot of meals with growing up. And he was based at the fish hatchery where the water supply reservoirs for the fish hatchery were stocked and were fishing opportunities. And I could, I would routinely go fish these, these impoundments at the fish hatchery.

Tim Birdsong [00:47:58] And then I had a, you know, a local college that had a career program, educational program in this field, and internship opportunity that I mentioned earlier was right there in my backyard as well.

Tim Birdsong [00:48:13] So, so without leaving the county, I had all these opportunities available, which is probably pretty unique, and I hadn't really thought about it until now.

Tim Birdsong [00:48:26] I guess I'm trying to pinpoint any sort of, you know, movies or television or books, but I know I've always been really interested in just kind of, you know, outdoor, you know, adventure-type stories and have till this day. I think I still, like if I'm looking through my streaming services and trying to pinpoint some show or movie that I want to watch, it's still, I'm still really into just this idea of being in nature and connected with nature and what it would take to survive without all the pleasantries that we're so, so used to.

Tim Birdsong [00:49:11] And, I guess my, you know, I made a comment earlier about my, the idea that I had of what an outdoorsman was, and you know, that I got from my relatives. And I think they had, there was always something that they were chasing and it was like, "Okay, it's the season to go target croppie, or it's the season to go target these spawning migrations of white bass, or now is the time of year that we can go target these schooling stripers on Lake Texoma." Or, they're going to be chasing shad on the surface this time of year. Or here's the time of year when it's time to go, you know, try to go set, you know, trot lines or float lines for catfish.

Tim Birdsong [00:50:09] It was, you had these seasons throughout the year that were recurring and it was linked back to the life history of these animals. And so, you learn a lot about the place and learned a lot about how, you know, how to think like a fish, so to speak.

Tim Birdsong [00:50:28] And so, I think that that kind of mindset that my dad and uncles and grandparents kind of brought to the outdoor experience, it kind of helped me see how the natural world worked, and it made me want to better understand it and study it in college and pursue a career in it.

Tim Birdsong [00:50:52] And, you know, I think that, when you pursue a career in fish and wildlife conservation, you tend to see things, and your values, your value judgments, change dramatically from most people in this world. And it's really tough to interact with other people productively.

Tim Birdsong [00:51:19] And, you know, just what you see on the landscape, right? Like if I'm riding with my wife, the dental hygienist, in a vehicle and there's a new development out in the Hill Country, "And, wow, those are some really pretty houses." And to me, my mind immediately goes to, "Well, how much water is it going to take to supply those houses? And what's the impact on all these natural landscapes that I really care about?"

Tim Birdsong [00:51:49] And, you know, I've had to learn that most people in the world don't think that way, and they don't want to hear about it, and they don't want to be judged for it. And they're very focused on human interests, human benefits.

Tim Birdsong [00:52:06] And, I think that I've probably spent, just like everybody in my profession, I think we spent a good number of years early in the career, just kind of ranting and raging and like, "We've got to protect this. We got to protect this. And how are you all not seeing the importance? And you're clueless. And you got to change your mindset. And, you

know, you're not on the same plane as me, and understand what needs to be done to protect this place, this animal."

Tim Birdsong [00:52:37] And then, you realize that that's not how most people think. And you're not, you're not going to convince people to get on board with you, if it means that it's going to impact their livelihood, impact their way of life, or, you know, maybe it's just, it's inconsistent with, you know, their goals, their interests and values.

Tim Birdsong [00:53:00] And so, that, especially in a private land state, it kind of leads you to trying to think about these kind of common-sense solutions.

Tim Birdsong [00:53:11] I think it was Teddy Roosevelt who said, I think it was, "It's common sense to have common problems for the common good." I think that was the saying.

Tim Birdsong [00:53:23] And so you just start thinking about, "Well, how can we achieve the bottom line for this rancher or for this developer? Or how can we help? Is there any opportunity for a more strategic approach that offers a win/win?" Or, it's not always a win/win, but a different way where there are compromises, there's give-and-take, and there's an awareness and a clear recognition of what the others at the table want out of this.

Tim Birdsong [00:53:59] And maybe, maybe for City of Austin, its reduced water treatment costs, it's improved water supply. It's maybe, you know, the water providers for, pick a community, may not care about Guadalupe bass populations persisting in the Hill Country. They may care less about species of rare endemic, you know, mussels, freshwater mussels or crayfish or invertebrates or, you name it, that occur in Hill Country streams.

Tim Birdsong [00:54:36] But they may get on board with the idea of protecting those streams so they can continue to flow and meet a downstream water supply need. And if you can implement actions to conserve watersheds, conserve riverscapes, so you have clean flowing water and that means reduced water treatment costs, water filtration type costs downstream, I'm sure that they could get behind that, get excited about that. Right?

Tim Birdsong [00:55:05] And so, it's sort of like, you know, San Antonio has invested significantly in protection of recharge areas in the Hill Country to benefit their water supply. The same mindset could apply for City of Austin or others that rely on the Highland Lakes - Lake Travis for water supply. You know, if a good bulk of the water that's being impounded the Lake Travis is flowing from the Pedernales or other streams or tributaries of the Colorado, upstream of Lake Travis, like the Llano or others, then I would think that folks that are relying on water supply there locally could get behind investments upstream in the watershed to protect their water supply.

Tim Birdsong [00:55:58] Again, they may not care about Guadalupe bass. But I don't need them to care about Guadalupe bass. I just need them to care about protecting those streams.

Tim Birdsong [00:56:08] So again, just over time, I think I recognize that I'm not going to convince everybody that Guadalupe bass is important, much less some non-game fish.

Tim Birdsong [00:56:24] You know, I can tell you that Guadalupe bass is recreationally and economically important. I can say that, you know, we did an economic impact study and that over a sixteen-month period, Central Texas stream fishing generated over \$70 million and half of the anglers targeted Guadalupe bass.

Tim Birdsong [00:56:43] And that may sound impressive, but that's kind of chump change to the value of water for development. And it's, but it is significant. It's really, it is significant to small communities in central Texas, places like Castell or Junction where you have a lot of anglers that actually go to those places to fish for Guadalupe bass, it is significant. But in the big scheme of things, that's not, that's not a lot of money.

Tim Birdsong [00:57:14] So just trying to think through, you know, where other folks are coming from, and what their needs are, and how you can plan out these conservation initiatives in a way that one set of partners that may be all about, "Hey, we're trying to conserve Guadalupe bass. We're trying to achieve certain population goals for this species."

Tim Birdsong [00:57:38] For another set of partners, that may be, "We're trying to improve water quality or improve water quality or flows. And here's a set of targets that we have."

Tim Birdsong [00:57:49] So just being able to be flexible and work with a variety of different organizations, and kind of broaden, you know, who you refer to as partners, stakeholders, I think that's been a real, a real hallmark for the Guadalupe Bass Initiative, in that we've, it's about, it's not just about one species. It's about over 150 different species that are benefiting from work to conserve Guadalupe bass.

Tim Birdsong [00:58:18] And people are benefiting from the work that we've done to conserve Guadalupe bass, whether they're an angler or recreational user of Hill Country streams or not. There are some tangible benefits to ranchers and communities from the work that we implement.

Tim Birdsong [00:58:35] So, I always get tested when I go back and interact with family, many of whom are, a lot of teachers, a lot of my folks that are ranchers or work in the oil industry and just being able to talk about the value of water and species and paddling and fly fishing and things that I care about that seem pretty trivial to some, you know, just trying to, it's always a challenge to try to present to them, you know, a case for keeping these springs flowing, keeping streams flowing, keeping...

Tim Birdsong [00:59:21] These are the places that folks who don't spend every day in the outdoors, places they like to go on vacation. Right? Like everybody. You hear lots of Texas songs, Americana songs, about, you know, the Frio. There's so many songs about tubing the Frio or the Guadalupe, or songs that talk about the Rio Grande, the Pecos, the Sabine, the Red. I mean, all these iconic Texas rivers, we like to talk about them as if they're places that are always going to be there.

Tim Birdsong [01:00:03] And a good number of those, you know, there are extensive reaches of those rivers that are often dewatered and almost, probably all of those rivers, even the Devil's River being the most pristine river probably in the southwestern United States, it's not completely set away from, you know, human alteration. I mean, they've all been, you know, dredged, dammed, polluted or otherwise dramatically altered.

Tim Birdsong [01:00:38] And that's just, that's the reality of it.

Tim Birdsong [01:00:40] But Texans, part of our culture is, you know, it's tubing the Comal, tubing the Guadalupe. So we like to do things like that. And we really like the Hill Country.

Tim Birdsong [01:01:00] I mean, the Hill Country is getting loved to death right now with all sorts of wineries and bed and breakfasts and other things that are being developed. So people really love these places and they want, you know, I think we want a future where you can visit the Hill Country and see these clear flowing streams.

Tim Birdsong [01:01:18] And it would be great if Guadalupe bass occur in those streams and you could fish for those species.

Tim Birdsong [01:01:25] So, there's a lot a lot of tangible benefits from the work that we do.

David Todd [01:01:30] Oh, definitely. Yeah. No, I see the value.

David Todd [01:01:35] I'm curious though, where the set of values that clearly are really deep, deeply inset with you come from. And you talk a little bit about your your family and your early experiences. One thing I was curious about is there were any teachers or mentors like that, who might not have been within your family, but still had a big impact on your outlook?

David Todd [01:02:04] Yeah. Yeah, I had a Mrs. Kreitz, my high school science teacher. Really small school. So she was all things - biology, zoology, ecology, whatever science classes I took. I do remember taking a zoology class in high school that I really enjoyed. I'm sure that kind of launched me as well. But, I remember the way that she taught. It was just so easy for me to really pay attention and take notes. And, you know, I don't know, I just wanted to soak it up.

Tim Birdsong [01:02:45] I can also remember I took a pre ACT in eighth grade. And she administered it and, as part of the ACT, there was a questionnaire about your interests. And it kind of led to offering up some recommendations for potential career directions. And I remember the general themes of the questions. But, you know, there were some questions like, "Oh, what would you like to wear business attire? Would you like to dress nice? Would you like to work indoors or outdoors?" And lots of other questions along those lines. But I, I remember I got the results of the ACT back and there was that little summary of what my career interests might be. And it said, "Undecided."

Tim Birdsong [01:03:44] And I've thought about that many times as I've gone back, because I've thought about the questions that were asked. And it's like, I probably said, "Yeah, you know, I want to dress nice," sure. I would like to wear nice clothes in my career. And I would like to work outdoors.

Tim Birdsong [01:04:04] And, you know, most of the responses that are provided, I doubt that they had fish and wildlife biologist, or fish and wildlife administrator, or anything like that, as a potential career direction for something like an ACT.

Tim Birdsong [01:04:21] So, it said, "Undecided."

Tim Birdsong [01:04:22] And then I look years later at where I am right now and really where I've been throughout my entire career. And sure, there were plenty of times that I needed to wear a suit, and I am headed to a Commission meeting to present some topic or, you know, lots of opportunities to interact in a professional setting, like conferences and things where I'm interacting with other fish and wildlife professionals and trying to strategize on where we go next with different initiatives. So there's definitely an in conference room, business travel, kind of element to the job.

Tim Birdsong [01:05:04] But then there's also the opportunity to spend every day, spend some portion of my time thinking about how we're going to do a better job of conserving the natural world and provide outdoor recreation opportunities, and not as much as I want to, but often enough I get to go out and at least where I am right now, do lots of project site visits, and go out and participate with the biologists who are actually leading the projects now.

Tim Birdsong [01:05:34] I'm more of an administrator, planning out initiatives and trying to secure funding and staffing and things to make these things happen. But, I still want to, you know, I want to maintain that connection to the work that's happening on the ground. So still plenty of opportunities to do that.

Tim Birdsong [01:05:55] So yeah, coming back to that ACT, I answered honestly at the time, and I think what I got out of this career is exactly what I was saying I wanted in eighth grade.

Tim Birdsong [01:06:09] Yeah. Mrs. Kreitz was a big influence.

Tim Birdsong [01:06:13] And then I had an English, you know, high school English teacher that was, Mrs. St John. And she was, you know, this teacher, I don't know how she ended up in southeast Oklahoma, but she was from New England and she was much more well-spoken than anyone else I knew. And she was really challenging as a teacher, and she expected a lot.

Tim Birdsong [01:06:45] And, but, I just remember really being exposed to writing, especially technical writing, through her classes. And I didn't really learn until college how much writing you do as a biologist. I mean like every biologist spends a whole lot more time writing than doing fieldwork. So whether it's briefings, proposals, project plans, reports, manuscripts, I mean, that's, that is a significant portion of the time, depending on your role, the significant amount of time spent on data analysis and data management, things like that.

Tim Birdsong [01:07:33] But, yeah, a ton of writing. And I think that being exposed to her class in high school, and really getting comfortable writing that, that was a real benefit.

Tim Birdsong [01:07:47] And then I've also, I've often said that the most beneficial class that I ever had in really undergraduate, high school, graduate studies, was keyboarding. And so I had a keyboarding class in high school. And, so yeah, a lot of the things that she would, she would have us type just, maybe this is more common than I know, but it was a lot of just kind of moral, ethical type writings that that she would have us type.

Tim Birdsong [01:08:30] But, anyway, I became a good, good typist. And it's just being comfortable writing and being comfortable typing makes you a really, you know, a much more productive biologist than a lot of my colleagues who are still very much the two-finger kind of thing. And so there's probably a level of productivity there that comes with just being comfortable writing.

Tim Birdsong [01:08:56] And so I don't know that that most folks who are, you know, most high school age, or even undergraduate-level, students who say they want to become a fish and wildlife biologist, they probably most don't have any idea how much time they're going to spend in front of a laptop, in front of a computer screen, and getting, the quicker that you get comfortable with technical writing and being a good typist, the more productive you can be.

Tim Birdsong [01:09:35] So anyway, those are, those are some.

Tim Birdsong [01:09:37] But I had a ... Tim Patton: he's about to wrap up his career I think. He's, Tim Patton, is a professor at Southeast Oklahoma. And, he was just arriving in Southeast Oklahoma when I was wrapping up my foray into professional baseball. And so I met with him, "Hey, you know, I was here a few years ago. Now I'm looking to come back to school and finish up and get on with it."

Tim Birdsong [01:10:11] And he really kind of took me under his wing and helped me fast track my undergrad and get that finished up and get on to grad school, and provided me with just a litany of professional development opportunities that I look back on now, and, you know, he had me serve as the editor of the Proceedings of the Oklahoma chapter of the American Fisheries Society, which that just meant that I was responsible for that year's conference, kind of pulling together all the abstracts and extended abstracts for articles that were written around the projects that were presented at the conference.

Tim Birdsong [01:10:54] And we have a similar role for the Texas chapter of the American Fisheries Society. But it's played by a tenured Ph.D. with a, you know, and so here I was this undergraduate that was playing a role that, that I see now was a really fantastic growth opportunity at the time. And the fact that he trusted me with something like that was ... I can really appreciate it now. And, you know, the number of projects they involved me with, I just had opportunities to go out and do surveys at lakes and rivers throughout southeast Oklahoma, north central, northeast Texas, just get exposed to a lot of really neat landscapes.

Tim Birdsong [01:11:40] Took me in as a friend too. And we did a lot of paddling. He's the first person that I was able to get some exposure to landscapes like Big Bend, you know, he took me on a spring break trip and, you know, with our spouses, we went and paddled St. Elena Canyon and I just fell in love with these Western landscapes.

Tim Birdsong [01:12:09] And so, yeah, I was heavily influenced by Dr. Patton, who had worked on freshwater fish, diversity, conservation and his doctorate work at the University of Wyoming. So, he had done kind of a status assessment of native fishes across Wyoming. So he probably had a lot of influence over my thoughts on, kind of landscape, range-wide, you know, biodiversity conservation type interests.

Tim Birdsong [01:12:50] And so, I had, when I was finishing up my undergrad, I could have stayed at Southeastern and finished a master's degree. But he really encouraged me to move on and get a master's degree somewhere else, get exposure somewhere else. And so, I had applied to the University of Idaho and got a master's project working on salmon in the Columbia River and, you know, incredibly excited to get something like that.

Tim Birdsong [01:13:24] And I knew that if I worked on salmon in the West, that would probably mean that the rest of my life I would be working on salmon in the West because it's pretty rare that you work on salmon in a graduate program, and then you end up working on bass in Texas. And so, I had, I accepted that. And I really, I had played baseball in the West and really thought I wanted to spend the rest of my life in the West. And so, I had this opportunity at the University of Idaho. And I was registered. I was in the graduate program. I was on the graduate listserv.

Tim Birdsong [01:14:08] And this is, you know, probably what would have been year four or five of my marriage and still married today. But, at the time, I was probably three weeks, two or three weeks, away from moving out early to Idaho to start this project. And my wife was

going to come later in the year, wrap some things up in Texas, north Texas, where we were living at the time.

Tim Birdsong [01:14:42] And she found out that her mother had cancer. And so, you know, it wasn't looking good at the time and really needed to make that a priority and be close to her mom who was in western Oklahoma. And so we said, "Okay, how realistic is this that we can make a life in Idaho in the next few years to do this graduate work?" And there was a path there where I could either finish the master's or just go pursue a Ph.D. directly, and/or, you know, finish the master's, go on to the Ph.D. or finish the master's, go into work.

Tim Birdsong [01:15:30] Anyway, there were some there were some options that were kind of typical for that program. And so, I kind of expected that this would be along a longer-term commitment in Idaho.

Tim Birdsong [01:15:47] But the travel time to drive to Spokane and fly to to Dallas or Oklahoma City and drive. It was just, it was unrealistic.

Tim Birdsong [01:15:58] And so, I gave up that opportunity and they were very understanding. And it's, I still interact with the major professor who I committed to work with. I still see her at American Fisheries Society conferences. And I'll routinely go up and say, "Hey, remember me? I'm that student to bailed on you at the last minute, right when you needed to begin the summer fieldwork."

David Todd [01:16:21] Life sometimes steps in and interferes.

Tim Birdsong [01:16:24] Yeah.

David Todd [01:16:25] Well, I think that's interesting to see where, you know, unforeseen detours can take you.

Tim Birdsong [01:16:33] Well, let me just ask you a few more questions. I don't want to take too much of your time today. But, you know, it's interesting that you had this deep set of values and concerns and passions about, you know, all fish and about riparian corridors and, you know, watersheds. I think though, just to sort of ground this for people who aren't really familiar with some of the species you've been talking about, it might be helpful to just introduce a neophyte to what a black bass, such as a Guadalupe bass, is all about, you know, just maybe a brief introduction to its life history and the ecological niche that it typically fills. Is that something you can help us with?

Tim Birdsong [01:17:27] Yeah, Yeah, sure. And so, I think most folks are familiar with largemouth bass. They've seen, you know, whether it was the Bass Pro Sharp's logo or something else, they know or have seen largemouth bass, which there is a, you know, a native form of largemouth bass that occurs in Texas, historically occurred in Texas before people before, you know, European settlement in Texas. And so most of our streams you would have largemouth bass that would be found in these rivers, and they would typically hang out in deeper, in pools.

Tim Birdsong [01:18:15] And so, most of our rivers are these kind of pool / riffle / run type environments. So you have a pool that's slower, deeper water. There's often vegetation. There would be boulders. There would be logs. There would be structure. And largemouth bass would typically hang out in the pools. And so they would hang out oftentimes in the

vegetation or behind the boulder, behind the log, and they're ambush predators and they wait for something to move through the water nearby. And they're hidden. And they just, they would bolt out and, you know, consume that prey.

Tim Birdsong [01:18:59] And for the eastern part of the state, you would also have spotted bass in those rivers. And then in central Texas, you have Guadalupe bass. There's kind of a dividing line that's almost the 35 corridor, where you see a transition from spotted bass to Guadalupe bass. And for spotted bass and Guadalupe bass, they occupy other habitats in those streams. So whereas largemouth bass hang out in the pools, you would see Guadalupe bass hanging out more in the runs and the riffles.

Tim Birdsong [01:19:35] So, the riffles would be where you would noticeably see the flowing water over the boulders in a stream. And then a run is kind of a transition in between a riffle and a pool, where there's still a bit of noticeable, you know, flowing water, but it's not moving as fast as a kind of a riffle that's often shallower or rockier.

Tim Birdsong [01:20:00] And so, Guadalupe bass will hang out in those, and really the entire riverscape, but different life stages, you'll have really young, smaller Guadalupe bass that'll hang out in the edges of those riffles and it's probably a protection-type strategy and they're also consuming much smaller prey that they can target. And they're similar kind of ambush predators like largemouth bass, but they're hanging out in those velocity refuges.

Tim Birdsong [01:20:33] So here's, here's flow - there's one big boulder in the middle of this riffle and there's a little bit of slack water downstream of that boulder. So it's hanging out right behind that boulder and darting out into the current to eat things that float by.

Tim Birdsong [01:20:47] And so, you know, if you're a Guadalupe bass angler, or a trout angler or, you know, as a river angler in general, you can probably walk up on a stream and you just look across the stream and you're like, "Okay, I think there's probably a largemouth bass occurring right there, right there, right there. And the places that I would cast for Guadalupe bass are there, there, there, there, there."

Tim Birdsong [01:21:14] And so you just kind of see that as an angler and you're looking for those - flowing water with some velocity refuge, some slack water, an eddy or some some sort of area where it doesn't take a lot of energy for the fish to just sit there and wait for things to float by.

Tim Birdsong [01:21:34] But then Guadalupe bass dart out into the current to to eat things. And whereas largemouth bass kind of sit in the slack water.

Tim Birdsong [01:21:46] And so as Guadalupe bass get larger, they tend to, they tend to be found more in those runs, and even the edges of kind of the upstream and downstream extent of the pools. And they'll associate with, you know, you're still looking for flowing water, but they'll start to associate more with the structural habitat that largemouth bass might associate with too, like logs and boulders and things like that.

Tim Birdsong [01:22:13] So, so naturally, largemouth bass and Guadalupe bass co-occurred in these, these streams for, you know, tens of thousands of years. And so they've been able to figure out ways to not hybridize. There was kind of resource partitioning where largemouth hung out in the pools, and Guadalupe hung out in the flowing waters.

Tim Birdsong [01:22:35] And so when you introduce a non-native bass that's basically a cousin to largemouth and Guadalupe, if you introduce smallmouth bass, which is native to the Great Lakes basin, St. Lawrence River, and and then some subspecies that are found throughout other tributaries of the Mississippi basin. But, but if you introduce something, a species like smallmouth bass that uses the same habitats as Guadalupe bass, then they're competing for space and competing for spawning habitat, competing for food.

Tim Birdsong [01:23:19] And maybe they're competing to the point where they stop competing and they just start to see each other as so similar that they start mating and then they live out their lives together. And over time, they hybridize and you no longer have, you know, when you don't have Guadalupe bass anymore, you have something different than Guadalupe bass.

Tim Birdsong [01:23:39] But, anyway, Guadalupe bass, the state record fish is roughly four pounds, just under four pounds, caught from the Colorado River downstream of Austin. So they're, they don't grow to a large size. That's a really big Guadalupe bass. Most Guadalupe bass would be one to two pounds. If you're going to go fish Hill Country streams like the Pedernales or Blanco or Llano, there's definitely the possibility that you could catch a new state record.

Tim Birdsong [01:24:14] And I, we, have collected new state records in our fish sampling, you know, using electrofishing and seining and other practices. We've collected bigger fish than the state record from places like the South Llano River, upstream of Junction and some really small streams that hold, you know, big Guadalupe bass. So they're out there, but they're mostly smaller.

Tim Birdsong [01:24:43] But they fight really hard because, you know, the habitat they use, they're used to swimming in these strong currents. They dart out into the current. And so, when you when you hook into a Guadalupe bass, as an angler, you just notice a fight. And they know how to use their body in the current and it's just, it's, it's a different kind of fight than a largemouth bass or other species that are more like your - there's still some fight there - but more like your big dog that just wants to lay over and but anyway.

Tim Birdsong [01:25:23] So, yeah, Guadalupe bass are nest builders. They'll build a nest. The male will build a nest usually, usually right at the edge of a riffle or a run and, you know, some rocky area that's got some kind of protection, again, that kind of velocity refuge from the flowing current, and attract a female where she'll lay their eggs. And then the male will protect the eggs. So they're nest-builders and egg-guarders, like a lot of our bass and sunfish.

David Todd [01:26:05] That helps. Thank you.

David Todd [01:26:09] I like the way you sort of put it in context with the spotted and the largemouth, and, you know, the different - the runs and the riffles and the pools - that helps me sort of place it. So thank you very much.

David Todd [01:26:25] You mentioned this earlier, but I think it might be worth just going back to this. What was the thinking with introducing this smallmouth bass, given that there was, you know, fishable fish in these streams in the Hill Country where the smallmouth were being introduced?

Tim Birdsong [01:26:47] And secondly, how did the biologists at that time start to realize that hybridization was taking place?

Tim Birdsong [01:26:58] Yeah. So, smallmouth bass have been stocked really throughout the globe. I mean, they're just a, they've been a popular fish to raise in a hatchery setting and introduce. And they grow to much larger sizes than species like Guadalupe bass. So I think, smallmouth bass have always been viewed as kind of a prized sport fish. And so fisheries managers and aquaculturalists have enjoyed working with them, enjoyed introducing them.

Tim Birdsong [01:27:41] So, back in the 1930s was the first time that smallmouth bass were brought into Texas. And at that point, they were being raised at a hatchery, a federal hatchery, in Arkansas. And I mentioned all these unique forms of smallmouth bass. Well, if you go into the Ozark Mountains, there's a unique form of form of bass called Neosho smallmouth bass. And it's found in the Ozark streams, and nowhere else in the world.

Tim Birdsong [01:28:11] And then in southeast Oklahoma, southwest and north Arkansas, there's Ouachita smallmouth bass. And so it's in the Ouachita Mountains. And so, the Ouachita strain of smallmouth is probably what they were raising in this hatchery in western Arkansas. And so, they brought those into fish hatcheries in Texas, and with this idea that they were going to start a culture program for smallmouth bass in Texas, fish hatcheries, again back in the 1930s, and did not know much about, well, about smallmouth bass at the time in terms of thermal tolerances and water quality. And it just simply got too warm. And in the summer months in Texas and the smaller just wouldn't persist in these hatchery ponds. And so they abandoned the smallmouth production program back in the thirties.

Tim Birdsong [01:29:14] And so, the federal hatchery system continued to raise smallmouth bass. And, you know, they were stocked in some of these situations where, you know, back in, of course, the fifties, sixties, lots of reservoirs, lots of dams being built, large dams being built in the southern U.S. And in some cases similar to like Canyon Lake, there's a, you would have a downstream release from the dam that's coming from really low levels of the reservoir. The water is really cold and warm water species that were naturally found there are not going to do particularly well.

Tim Birdsong [01:29:56] And so, smallmouth bass were stocked in a lot of those settings - you know, downstream of these cold water release dams in the south into warm water streams. So they did fairly well, as did rainbow trout. So a lot of rainbow trout stocked in those types of settings.

Tim Birdsong [01:30:16] So, I think that the federal hatcheries there was more than likely probably some sort of mitigation type program that was occurring. I know for a fact that a mitigation program was occurring for trout where federal hatcheries were raising trout to stock in these tailraces to offset impacts that these federal dams had on aquatic life in those streams, so, to provide an angling opportunity that wouldn't otherwise be there because the stream temperatures had changed, and the native warm water species would not be able to occur.

Tim Birdsong [01:30:52] So, smallmouth bass were being raised by these federal hatcheries including the Tishomingo federal hatchery in south central Oklahoma, southeast Oklahoma. And so, smallmouth bass are being raised at this federal hatchery. And we had some biologists with the Texas Fish and Game Commission at the time, back in the late fifties, that were

looking for, they were tasked with finding opportunities to establish smallmouth bass in Texas.

Tim Birdsong [01:31:26] And this is a true story. I was dress shopping with my wife in Fredericksburg. And we went into some boutique and, you know, she's shopping and I'm just trying to kill time. And I go to the back. And there are crates and crates of Texas Game and Fish magazine articles. And I'm looking to see if I can find it quickly. But there's a ... so I'm going through these old mint-condition, 1950s-era Fish and Game magazine articles. And I see a cover that I'm like, "That is, that's a Guadalupe bass." And I'm like, "What in the world?"

Tim Birdsong [01:32:15] And so, I, you know, and it looks like it's kind of odd because it looks like someone's got a fly rod in there, fly fishing. But it had a spoon, like a heavy spoon, that you would not have flyfished with that was protruding from that Guadalupe bass' mouth. But it was obviously, I got the theme of it, that someone was fishing for this stream fish in the Hill Country that looked like Guadalupe bass.

Tim Birdsong [01:32:44] So, in the article, this was 1958. It had two pieces in there. One was like a fish I.D. guide. And it talked about that in Texas, we have largemouth bass and we have spotted bass and we have Texas spotted bass. And it turned out that they were referring to Guadalupe bass as Texas spotted bass within my, you know, our predecessor agency at the time.

Tim Birdsong [01:33:17] And so, so, you know, I tried to reconcile the timing of the, you know, the characterization of Guadalupe bass as a species which occurred in the early fifties, I think it was early fifties. I need to double check that. But, you know, the naming of Guadalupe bass, as, you know, *Micropterus treculii*, Guadalupe bass, that occurred several years prior to this article and that was described by University of Texas professor, Dr. Hubbs.

Tim Birdsong [01:33:58] And so, it was, you know, this is several years prior to this article. And so, our own agency had not adopted what ichthyologists had decided to name this fish in the literature. So, we were calling it Texas spotted bass still.

Tim Birdsong [01:34:22] And then also in this magazine is a story written by two fish and game biologists at the time on how they found the South Llano River, they believe it to be, the best possible place to introduce smallmouth bass in Texas. And they think that because of the springs and this cool water input in the summer that it's going to meet the thermal tolerances of smallmouth bass. They're going to be able to hang on there. We're going to provide this great fishery. It's going to be another angling opportunity. There are largemouth bass and there's some other, this Texas spotted bass, that occurs there, too. But here's another fish that you're also going to be able to fish for - smallmouth bass that grow much larger and it's going to be really exciting.

Tim Birdsong [01:35:12] And so, they're launching off into this project where fish are being brought from this federal hatchery in Oklahoma and stocked in the South Llano River upstream of Junction, and they stocked from 1958 to 1960. And it didn't show up in our stocking records because they weren't produced in Texas state fish hatcheries. They were federal hatcheries. And so, years later, so this is '58 to '60 that they were stocked.

Tim Birdsong [01:35:44] And then in 2009-10 timeframe, we were using the National Fish and Wildlife Foundation dollars that I mentioned earlier to implement restoration of habitat.

We were doing these inventories of, these assessments of Guadalupe bass conservation status and trying to understand hybridization rates in different populations.

Tim Birdsong [01:36:12] And Dr. Preston Bean who is now, he was a Texas State University student, now he's a researcher with Texas Parks and Wildlife. He worked on a, he did his dissertation on genetic status of Guadalupe bass. So what he found was that there were hybrid, a really low level of hybridization, but there were hybrid fish in the South Llano River. So smallmouth bass / Guadalupe bass hybrids in the South Llano river, and which was really confusing at the time because we had no records of smallmouth bass ever being stocked by Texas Parks and Wildlife Department in the South Llano River.

Tim Birdsong [01:36:57] And so, this was a few years after that that I found this article at this dress shop in Fredericksburg. And it's like, there it is. We did work with the Service to stock smallmouth bass back in the fifties.

Tim Birdsong [01:37:13] And so in 2010, we're still seeing the effects of that - really low levels, but it's detectable. You're picking up these smallmouth bass genetics in that population.

Tim Birdsong [01:37:28] So, we, again, the mindset back in the fifties was create, create these great fishing opportunities, by stocking smallmouth bass. I don't know why that project was abandoned. But they did not continue stockings. Maybe it wasn't, maybe it was a supply issue in getting fish from Oklahoma. I don't know.

Tim Birdsong [01:37:51] But, then in, I think it was 1973, 1974, our department decided to go full on into establishing smallmouth bass fisheries.

Tim Birdsong [01:38:05] And there was an interest in Hill Country streams, but it was more about these big canyon-style reservoirs, big rocky reservoirs, that were managed more as kind of a flow-through system. So, places like Travis and Canyon Lake, places like that, where you would think that smallmouth bass would do really well.

Tim Birdsong [01:38:30] And so, we brought fish, those same fish still produced at that federal hatchery in Arkansas, brought fish from there into our hatchery system, produced primarily at our fish hatchery in San Marcos, the state fish hatchery. So fish began being produced, you know, tens of millions of smallmouth bass stocked from 1974 to 1981 in these Hill Country streams and in these big canyon-style reservoirs that the biologists thought they would do well. So that's marching along.

Tim Birdsong [01:39:09] And then Dr. Hubbs at UT, he's doing sampling with his students. He was the ichthyologist. He was the curator for fisheries within the natural history collections at UT, and kind of considered the godfather of Texas fishes. And so he recognized in the late seventies in the Guadalupe River and specifically, I think, some fish that were being provided by anglers from Canyon Lake. It was like, "Hey, you know, we're catching these fish, and we don't really know what they are. They look different than what we've seen before."

Tim Birdsong [01:39:49] But, Guadalupe bass would occur in Canyon Lake, and now you're starting to see these smallmouth / Guadalupe bass hybrids. And so they're seeing these hybrids throughout places where smallmouth bass were stocked.

Tim Birdsong [01:40:06] So Dr. Hubbs approached Texas Parks Wildlife Department and raised the red flag that, "Hey, this is something unique. It's found in Texas, nowhere else in the

world. And the smallmouth that are being stocked are hybridizing with this fish. So this is something to be concerned about."

Tim Birdsong [01:40:29] And interestingly enough, Gary Garrett, Dr. Garrett, was a student of Dr. Hubbs. And so Gary was hired as a research biologist for Texas Parks and Wildlife Department in the mid-eighties, early to mid eighties. And so he's coming in. The agency halts stocking of smallmouth bass in Hill Country streams in the early eighties.

Tim Birdsong [01:41:06] And so, when Gary comes in, he has the opportunity to pursue some research on the status of Guadalupe bass in the Hill Country. So, he does an initial kind of range-wide status assessment, looks at genetics data, starts to fill other gaps in understanding and just biology, life history, angler interest, all of that, and puts together, after a lot of work throughout the mid- to late eighties, puts together a range-wide conservation plan for Guadalupe bass that was published in 1991.

Tim Birdsong [01:41:41] And that's the date that I have keyed in on as really the beginning of the Guadalupe Bass Restoration initiative. That's where it really launched was when Gary published that plan.

Tim Birdsong [01:41:58] Yeah, Gary's the one that generated the idea that we should really, we should consider stocking pure Guadalupe bass in these systems and try to overwhelm the hybrids.

Tim Birdsong [01:42:12] So, the swamping effort, as he called it, so that was initiated and at the time knew that hybridization was occurring in the Blanco and a lot of other places. But, his office was in Mountain Home on Johnson Creek, one of the headwaters of the Guadalupe River. And so they had an old hatchery there that was able to produce Guadalupe bass for this stocking program. And, you know, they only had capacity to really choose one focal area at the time. And so he said, "Well, it's going to be the namesake Guadalupe River."

Tim Birdsong [01:42:53] So wasn't really able to do anything with the Blanco at the time, in the eighties and nineties. And so by the late nineties Guadalupe Bass had blinked out for the Blanco. They were, you couldn't find the Guadalupe bass in the Blanco anymore.

Tim Birdsong [01:43:09] And so, it's taken some time, really, throughout the early 2000s to now, that there's been clear interest from the angling community, especially fly fishing community in conservation of Guadalupe bass, and, you know, holding up Guadalupe bass as this really unique kind of bucket-list fishing experience. People travel in from elsewhere around the U.S. to come catch a Guadalupe bass. They do.

Tim Birdsong [01:43:43] And Bassmaster magazine created something called the Bass Slam, where they challenge anglers to catch all these unique forms of bass. And so they've got a map, and a form you fill out to show that you caught all these fish. So the interest continues to grow.

Tim Birdsong [01:44:01] And we've got over 25 flyfishing clubs in Texas that are members of Fly Fishers International. So there's an Austin Fly Fishers, a Fort Worth Fly Fishers, and they're all really jazzed about helping conserve Guadalupe bass and a lot of their fishing outings are to Hill Country streams.

Tim Birdsong [01:44:19] And so, anyway it's now the species has become recognized as a game fish in and of its own right, whereas I guess it was just the size, but, you know, it was just

a value judgment by those biologists back in the thirties, fifties, seventies, that smallmouth bass was the right thing to do.

Tim Birdsong [01:44:43] And I don't think they recognized fully the tradeoff between smallmouth and Guadalupe bass at the time. I don't know that they really expected that hybridization to occur.

Tim Birdsong [01:44:53] But there's been a trend in recent decades, for sure, to value fish diversity. So, you see similar slams for native trout in the West, these really dinky trout, really small-bodied trout like Rio Grande cutthroat trout, Apache trout. You have anglers that want to go catch all these different forms of trout.

Tim Birdsong [01:45:18] And, you know, you hear about coastal slams and turkey slams and a lot of, you know, fishing and hunting focused challenges where you're trying to take a similar approach as like birders. Right? Like, you've got your birding checklist and now you're starting to see that in the angling and hunting communities as well.

David Todd [01:45:41] Well, it's interesting how I guess the politics and the kind of constituent support you can have for a fish can make a big difference.

David Todd [01:45:52] So, I think you touched on this earlier, but I'd be curious if you could maybe give us an example or two. You have this interesting kind of way of thinking about fish restoration and protection in that you, you seem to think about as a watershed, basin-wide kind of effort. And I was hoping that you could give us some examples of, say, you want to approach a landowner and give him some options of ways that he or she could benefit the Guadalupe bass and the river and maybe his or her land as well. Are there some examples you could provide there?

Tim Birdsong [01:46:35] Yeah. Yeah, sure. These are, for the most part, really like commonly used conservation practices that would be recommended by many of the technical guidance staff that work with ranchers. So whether it's the Natural Resource Conservation Service, NRCS, Department of Agriculture or, you know, ag extension services or you know, Parks and Wildlife wildlife biologists, I mean, you would hear and see a lot of these same practices supported through Farm Bill, conservation delivery programs, etc.

Tim Birdsong [01:47:16] But, the types of things that we've promoted and tried to incentivize to landowners have a lot to do with the riparian corridor. And so, you know, there's just a tendency when you have land along a river to want to see the river and view vegetation along the river as a hindrance to recreation or your viewshed or, you know, benefiting from having riverfront property.

Tim Birdsong [01:47:48] And so, oftentimes those areas will be cleared, whether it's for recreation or esthetics or, you know, maybe it is just trying to clear more land for your cattle or goat operation.

Tim Birdsong [01:48:03] But, we just see a lot of land clearing along rivers and planting of vegetation that doesn't have deep roots. So it's not real stabilizing for a Hill Country stream, which is naturally real flashy. It's a real, you know, these are really rocky systems, limestone. And so, when you have rainfall in many of those systems in the Hill Country, it's, they're real flashy. There's flow increases dramatically over a short period of time.

Tim Birdsong [01:48:41] And with that, if you don't have plants that can stabilize soils along the stream corridor, then you'll see erosion and down-cutting and eventually you'll see issues that ranchers will care about. Right? Like they don't want to have an erosional bluff, an erosional bank. They don't want to see, you know, a bend in the river continue to eat into their land, and they're literally losing land.

Tim Birdsong [01:49:12] So, we see a lot of those kinds of situations where it's, well, let's figure out ways to help incentivize stabilization of the banks, planting of grasses and shrubs and trees that will stabilize the bank.

Tim Birdsong [01:49:29] But then the other part that's really important for fish is the fact that that has on keeping gravel substrates exposed, because if you have a lot of sloughing of sediments from these banks in the river, you can cover up those gravel substrates that are really important as spawning habitat for fish.

Tim Birdsong [01:49:51] And the other thing is that shading is really important. So trying to keep stream temperatures down. So, you want to see a canopy, a tree canopy along a stream corridor where there's shade and where there's also some input of terrestrial insects. So when you have grasshoppers or other terrestrial insects that are falling in the stream, that's a favorite food of species like, Guadalupe bass.

Tim Birdsong [01:50:21] And we even, we funded a diet study several years ago. A Texas State University student worked on it, found that, it was different, it was variable for different streams of the Hill Country, but you would see a large percentage of the diet, up to 50% of the diet of certain life stages of Guadalupe bass would consist of terrestrial insects.

Tim Birdsong [01:50:42] And it's no surprise that fly anglers, one of the most popular flies that's used to target. Guadalupe bass is like a grasshopper imitation fly. And so they really like terrestrial bugs. And when you have a healthy, functioning riparian corridor that you're going to get more of those terrestrial bugs and that contributes to the diet.

Tim Birdsong [01:51:04] And you also get input of limbs and stumps and root wads and you get wood in the stream, which is really important habitat for Guadalupe bass. So, you know, we're interested in seeing structure like that that ends up in the stream.

Tim Birdsong [01:51:25] And more often than not, you know the landowner, if they want to view that area as a place for swimming and tubing then they might not be real excited about that root wad from that dead tree, that stump, or, you know, that fallen tree being kept in the water.

Tim Birdsong [01:51:45] But it takes some encouragement from us to talk about the value of that wood from stabilizing the stream helps trap, you know, trap sediment, trap material that allows vegetation to grow up along the corridor, but provides that structure and habitat.

Tim Birdsong [01:52:10] So it's usually those kinds of practices that whether it's fencing livestock out of stream corridors or providing cost-share incentives to, you know, literally buy the fence or buy plant materials, you know, plant trees and shrubs and grasses.

Tim Birdsong [01:52:31] But, you know, sometimes we've coordinated with volunteer groups to bring them in to help with planting projects.

Tim Birdsong [01:52:40] A lot of invasive species removal: you have species like *Arundo donax*, giant reed, river cane, a lot of different names, but plants that will form really dense stands along rivers and they channelize rivers and they just kind of narrow and deepen rivers. And you end up with a kind of monotypic habitat that is not real beneficial to much.

Tim Birdsong [01:53:08] And so we'll go in and actually working across I think it's five different rivers now in the Hill Country where we're paying to do control of this non-native reed in trying to restore native species, native plant species along the corridor.

Tim Birdsong [01:53:29] We've done fencing of recharge features, fencing of springs, protection of spring runs.

Tim Birdsong [01:53:38] But yeah a lot of a lot of kind of riparian planting, riparian shading type projects.

Tim Birdsong [01:53:43] We've got teams that are looking into, we have grants right now to support some kind of demonstration projects, where we're looking to get more involved in the world of voluntary water transactions - so, leasing water. So, if you have an irrigator that has irrigated his hay field and maybe there's a way for us to help provide some cost-share funding to buy more efficient irrigation equipment and they can still meet their need, but the water savings stays in the stream to support base flows or subsistence flows in the summer.

Tim Birdsong [01:54:25] Or, maybe there's a water right that we can use, that was water previously used for a particular need and that need is no longer there. And so we could maybe lease or or acquire water to convert it to another use, you know, instream flow use, environmental flow use that would benefit Guadalupe bass, benefit recreation. So we have some grants to do that.

Tim Birdsong [01:54:54] That's kind of new territory for Texas. And lots of legalities to work through and you know precedents that will need to be set.

Tim Birdsong [01:55:09] If you acquire a senior water right at the downstream extent of some stream and you're really wanting that senior water right so you can make the call for that water to be able to reach that diversion point when you really need it, which is probably during drought conditions. Right? And that's also when all the straws upstream of your point really need it as well. And so there's, I'm sure, trying, even though it sounds good to try to keep water in streams for the environment but when it comes down to it, in a drought scenario, yeah, you got to expect that human needs are going to trump those marital needs.

Tim Birdsong [01:55:52] And so, just don't really know what to expect despite our best efforts to try to keep water in streams. We're still working through what we consider to be some innovative strategies to try to do that.

Tim Birdsong [01:56:09] This is not something we pioneered. This is pretty common in the West to pay ranchers to not irrigate certain fields and keep water in stream for streams, for to meet certain, you know, flow requirements of trout, salmon, you name it.

Tim Birdsong [01:56:26] And there's also a lot of strategies that get used in places like the Klamath Basin where there are sources of groundwater, there are sources of surface water, depending on the time of year and levels of the aquifer and spring flow, you can kind of toggle

between those uses to try to maintain the ideal flows and temperatures and all that you need to put to help more cool-water, cold-water species to survive.

Tim Birdsong [01:56:54] So, anyway, those are some examples of the kinds of things that we've continued to support.

David Todd [01:57:00] Great. It sounds exciting and innovative. I wish you well.

David Todd [01:57:06] So just a couple of more questions and I think we can let you go on your merry way.

David Todd [01:57:14] One is that I noticed that you have been helping steer the Texas Aquatic Invasive Species Working Group for the last seven or eight years. And I was wondering if you could help us sort of put the Guadalupe bass in context with smallmouth bass and this sort of threat from species that are not native to a reach. You know, maybe, see the sort of bigger picture that the Guadeloupe bass' hybridization, genetics swamping, occurred in.

Tim Birdsong [01:57:49] Yeah. So invasive species, whether they're aquatic or terrestrial, yeah, a lot of significant issues, whether it's disease or competition or predation or just alteration of habitat. There's just a lot of impacts that are had from species that are native to oftentimes Southeast Asia, Europe, other places, that were brought over to meet some kind of need.

Tim Birdsong [01:58:19] And I mentioned this river cane, giant reed, earlier - *Arundo donax*. You know, it's, I've heard a variety of stories of where that species originated, but it was brought into the U.S., for the stories I've heard are, you know, a reed that can be used to build, you know, thatch-type materials to work with, to build, whether it's, you know, baskets or, you know, it's just a plant material that you can weave and you can build things with, and so that was viewed as valuable enough.

Tim Birdsong [01:59:00] And I've also heard that historically it was used as a strategy to help stabilize eroding banks and streams, that you could bring in species like salt cedar or *Arundo donax*, and that it was actually viewed as an environmental benefit at one time.

Tim Birdsong [01:59:20] And so, anyway, a lot of unintended consequences from bringing in plants like that, bringing in species like common carp.

Tim Birdsong [01:59:32] That common carp was brought in as a food fish back in the probably 1800s, early 1800s, I think, and if not earlier, but brought in as a food fish thought by the U.S. government that this would catch on as a real popular food fish, and it did not. Now common carp are found in probably every river in Texas.

Tim Birdsong [01:59:59] You have grass carp that are non-native to Texas that were brought in because they do prey upon, as their name suggests, different nuisance vegetation. And so, they're been used as a species to specifically target plants like hydrilla.

Tim Birdsong [02:00:18] And so, a lot of different plants that are aquatic plants are real problematic for rivers and lakes that have been brought in for the ornamental trade, so for water gardens and water hyacinth and other species that were brought in for the aquarium trade like hydrilla, giant salvinia.

Tim Birdsong [02:00:41] And so, you have all of these various non-native, especially aquatic, plants and animals that can be really disruptive.

Tim Birdsong [02:00:58] So yeah, we had gone to the legislature back in, I guess it was 2014, '15 timeframe, and started to raise the flag that, hey, we really need to do something to try to get on top of this problem with aquatic invasive species. And not that smallmouth bass hybridization with Guadalupe bass is insignificant, but we've got all these other issues where you can really show a far-reaching impact, you know, with giant salvinia just covering Toledo Bend Reservoir, covering Caddo Lake. And you see, in the case of Caddo Lake, this like internationally recognized wetland that's just an incredible place and it just looked like a pasture. You just had vegetation just growing across the surface of the lake. Same with Toledo Bend, and close to 50 other lakes in Texas that were nearly covered in vegetation.

Tim Birdsong [02:02:07] And so went to the Legislature and just said, "This is an issue that goes far beyond impacts to just fishing and hunting or boating or things within the purview of Texas Parks and Wildlife Department. We're talking about clogging water intakes for energy production and water supply. We're talking about loss of property values around some of these lakes. So, you know, it's really a big issue that we need to tackle."

Tim Birdsong [02:02:39] And comparatively, Florida and Louisiana were investing, you know, tens of millions. I think at the time, Louisiana was investing around 18 million annually in aquatic invasive species management. And Florida was, you know, it was much more than that.

Tim Birdsong [02:02:59] So, I made a case that this should not be funded on the backs of the hunters and anglers who purchase fishing licenses that fund the bulk of our operations at Texas Parks and Wildlife, that this should be general revenue, general taxes from the state that should support some of this kind of work.

Tim Birdsong [02:03:20] And so, the Legislature came through and they provided roughly three and a half million annually since 2016, that's been available routinely. And we've really made a huge dent in trying to kind of claw back and control.

Tim Birdsong [02:03:41] You know, once you have species introduced to an area that do so well at just increasing their, expanding their coverage so quickly like giant salvinia and some of these other plants do that will just nearly double in size just in a matter of days. You just, you recognize that you're probably never going to eradicate, but you can. You could try to stay on top of it and keep key populations at a low level where it can be manageable. And so, we've taken that three and a half million a year, which was, you know, we were asking for something more like, it was a much larger dollar amount, 40 million, I think is what we thought we needed. And somewhere in between 40 and three and a half is probably what we could productively, effectively make use of given current staffing and just contracting capacity and all the administrative things that are involved in trying to implement control work like this.

Tim Birdsong [02:04:56] But yeah, we've dramatically reduced the coverage of plants like giant salvinia and others. So as I mentioned earlier, we've implemented large-scale removal of and control of *Arundo donax*, this giant reed, across Hill Country streams, large-scale control of elephant ear in some streams in central Texas, large-scale control of salt cedar on the upper Brazos River, and starting to get involved in some ideas on how to control tilapia and some other non-native fish that have been introduced.

Tim Birdsong [02:05:35] Of course, there have been groups working for quite a while in places like the San Marcos River to try to tackle the issues with species like, hypostomus, this suckermouth catfish. And, you know, popular in the aquarium trade: they keep your tank clean. And then they grow to a size that they can't be supported in a tank any longer. And then, you know, the next step is that aquarium hobbyists usually stock this fish in streams because they care too much about them to kill them.

Tim Birdsong [02:06:13] Well, they persist in these streams, especially spring-fed streams. These are tropical fish, subtropical fish, that do really well in thermally stable systems like the San Marcos or the Comal River. So, if you've gone tubing either of those places, you've likely saw this fish that I'm talking about. And they clean your fish tank. Right? They graze on algae in the fish tank. And they do the same thing in the wild. They graze on algae on rocks, which is what a lot of our native fish do. So they compete with the native fish for food.

Tim Birdsong [02:06:50] They also burrow into banks so that they destabilize banks and become a real problem.

Tim Birdsong [02:06:56] But, yeah, you know, lots of non-native fish and plants that have, and snails and crayfish and you name it, that have been introduced all around the U.S. (and Texas is not immune to that). I think Florida's kind of recognized as being basically one big, you know, aquarium, terrarium.

Tim Birdsong [02:07:22] And we're not quite at that level of problem. But, yeah, we've been coordinating closely over the last ten years roughly, to try to put together a coherent plan for trying to manage the invasives that we have and try to get out ahead of others.

Tim Birdsong [02:07:41] And hopefully you've heard about some of our state-wide outreach and awareness campaigns. There's a number of these campaigns that we've implemented to try to bring awareness of problems associated with species like zebra mussels: "Clean, Drain, Dry." Have you heard that, that messaging? Hopefully you saw a billboard or radio segment or TV spot or something.

Tim Birdsong [02:08:09] But we've put a lot of effort into trying to do that, and we have regulations too, for anglers to drain their boat so they don't transport larval stages of zebra mussels from one lake to another.

Tim Birdsong [02:08:24] We now have Asian, well, invasive carp. We've got a number of different invasive carp species, but bighead carp and silver carp are two that have become really problematic in the Midwest. And, if you've seen boats moving along and all these fish jumping out of the water and hitting the driver, that's, you know, silver carp.

Tim Birdsong [02:08:47] So bighead and silver carp are in the Mississippi basin. They're making their way up the Red. Of course, the Cypress basin, Caddo Lake is in the Red River basin. The Sulfur River is in the Red River basin. We've got a good number of other streams - Choctaw Creek Bois d'Arc Creek, the Wichita River - that flow into the Red, and those Asian, those bighead and silver carp are making their way into Texas waters there.

Tim Birdsong [02:09:16] They're already here. They're pretty prominent below Lake Texoma on the Red River. So that's just the next thing that's knocking on the door of Texas.

Tim Birdsong [02:09:26] Snakeheads, which have become a big problem in Maryland. And they were introduced in Arkansas. We haven't had a confirmed case of snakehead in Texas yet, but just the number of species that find their way into Texas waters, you know, that have a negative impact on natives is increasing.

David Todd [02:09:53] Well, sounds like the Full Employment Act for fisheries biologists like yourself.

David Todd [02:10:02] Well, maybe just one last question. You know, is there anything that that perhaps we overlooked? I'm sure there are many. Maybe is there something that really comes to mind that you'd like to add about the Guadalupe bass or your work in the fisheries field in general?

Tim Birdsong [02:10:29] Well with Guadalupe bass, I'll just say that we, you know, we have tried to add as much fishing access as we can. We have 25 access sites right now that are set up by Parks and Wildlife to provide fishing opportunities in the Hill Country streams for Guadalupe bass. And I guess our general mindset is that if you get people out there using the resource, that they'll be more apt to care about the resource, want to protect the resource, whether that's in their voting decisions or just, you know, decisions they're making about their family, their personal lives that have impacts on the environment, that they'll have a mindset that is considerate of, in this case, of Hill Country streams and species like Guadalupe bass.

Tim Birdsong [02:11:17] So, we want to get people out. That's really the whole concept around other programs that we operate at Parks and Wildlife, like Texas Paddling Trails, for instance. We have roughly 85 paddling trails now.

Tim Birdsong [02:11:30] We're just trying to get people out to experience rivers and streams. We have some paddling trails on the coast and on reservoirs, but we're trying to get people out to these more natural settings to experience something other than, you know, an artificial type environment.

Tim Birdsong [02:11:47] Nothing against ... I like taking my kids to Schlitterbahn. I've taken my kids to Great Wolf Lodge and places like that.

Tim Birdsong [02:11:53] But, you want to see people value these natural settings. And we're just trying to provide opportunities to get them out there and experience it.

Tim Birdsong [02:12:03] And so you can see things that happen, for example, with the Legislature passing this State Parks Centennial Fund, you can connect the importance of making money available for new parks and new natural areas and new outdoor recreation landscapes back to, you know, creating a stewardship ethic conservation out there, getting Texans excited about conserving the natural world like that.

Tim Birdsong [02:12:36] It, to me, it really is contingent upon providing quality outdoor recreation opportunities. And having lived in Austin for quite a few years, just moving away recently. But, you know, I felt like I hit the glory days of being able to experience the Barton Creek Greenbelt and getting to experience Lady Bird Lake and taking my kids out.

Tim Birdsong [02:13:07] I had, my kids have memories of listening to - I'm not making this up - so it was, you know, I don't remember if it was ACL or South by Southwest, but one of the

music festivals mainstage right there at the confluence of Barton Creek and the Colorado River there on the Lady Bird Lake, and, you know, stand-up paddleboarding. So rent stand-up paddleboards at the Texas Rowing Center. And we're paddling around and we've got spin cast rods. We're fishing. We're catching fish.

Tim Birdsong [02:13:43] And really had no idea that that, you know, the timing of this that, you know, we're just like, well, let's go check out Barton Creek. And it wasn't that busy. Like my kid was, he was fishing. He was also getting bored, and doing cannonballs off of the paddle board, swimming around, trying to catch turtles, whatever.

Tim Birdsong [02:14:12] And he's sitting there living out his best life. And I'm sitting there fishing. And I promise I'm not making this up. All of a sudden, there's this very recognizable voice. And it was, "All right, all right, all right." So, anyway, Matthew McConaughey is introducing Willie Nelson at this music festival. And I'm sitting there fishing and my kid's swimming around by his paddleboard trying to catch turtles. And I get to listen to "Whiskey River". I remember and so I'm listening to Willie Nelson and Matthew McConaughey and they're on the main stage that I could throw a rock and hit.

Tim Birdsong [02:14:56] And I just thought how incredible to have this kind of outdoor recreation opportunity to connect with, you know, and for my kid to experience this. Both of my kids were able to grow up in that kind of environment.

Tim Birdsong [02:15:13] And we got to explore the, like I said earlier, the Onion Creek Greenbelt, Bear Creek Greenbelt, Slaughter Creek Greenbelt. A lot of the southwest Austin stream corridors and Barton Creek and Lady Bird Lake, and so a fair bit of stuff at McKinney Roughs, on the Lower Colorado River LCRA park that you can hike down to the river there - a couple of big shoals, a couple of big riffles that you can fish and catch Guadalupe bass there.

Tim Birdsong [02:15:47] So, I've just had opportunities to expose my kids to all of that.

Tim Birdsong [02:15:52] And so, anyway, I say that because paddling trails and parks and all of these provide opportunities for Texans to get out and have that kind of experience with their family. And I think my kids are much better informed because I exposed them to all of that.

Tim Birdsong [02:16:09] Of course, they've heard me give Guadalupe Bass Restoration Initiative talks way more times than they're willing to admit. I drug them around to fly fishing festivals and other events where they've heard me give a lot of these talks.

Tim Birdsong [02:16:23] But, I'm starting to see them, you know, late in high school, care about natural resource conservation and consider a career in this field. I've got a soon-to-be senior who claims that he wants to follow in my footsteps and work in this arena.

Tim Birdsong [02:16:41] So, whether I meant to or not, I think I had an influence. And I hope that, I hope that the recreation component of our mission as an agency, I hope that folks can connect with that and experience the outdoors, because, to me, I do see it for myself, my childhood, and my own kids, I see it as kind of a gateway to caring about nature, valuing nature, wanting to make decisions in your life to help conserve nature.

Tim Birdsong [02:17:13] And in a state that's growing as fast as Texas in terms of human population and all that brings with it, with demands for water and and impacts to habitat for

fish and wildlife, you know, I think we've got to make some hard decisions if we want to take care of what remains.

Tim Birdsong [02:17:34] And I really believe, like I said earlier, you hear so many Texas country music songs, Americana songs that are sung by Texas artists that talk about, you know, Texas landscapes and like what's so important about the Texas experience. And oftentimes it has to do with rivers. I mean it's pretty routine that in those songs it hearkens back to some experience on a Hill Country river in particular.

Tim Birdsong [02:18:10] And so, I just, I hope that we can take care of these places. And I think it's going to take people getting that kind of exposure to recreation to develop an interest. Not everybody is going to be able to own a 200-acre ranch on the banks of some pristine Hill Country stream and just have that esthetic value, or that kind of value that's connected to, you know, passing on a family tradition or something or, you know, passing on a legacy. You know, not everybody's going to have a ranch that they can conserve. You know, it's not a Yellowstone TV series, you know, for everybody.

Tim Birdsong [02:18:52] But it's, you know, maybe they can see these public areas, these public rivers and public lakes and public parks, as places that they feel some sense of stewardship, responsibility for. And that'll help inform how they think about how they live their lives. So...

David Todd [02:19:15] That seems very, very wise. I mean, it's interesting how you seem to translate this from talking about, you know, the dollars and the science of doing conservation work, to this sort of participation and love and appreciation and, you know, sort of a value-based way to save these things.

David Todd [02:19:42] So, sounds like you got the waterfront covered.

David Todd [02:19:47] I wanted to thank you for taking time to do this. It's really been interesting and valuable. So thank you very much.

Tim Birdsong [02:19:54] Good. I enjoyed it. Thanks for the opportunity.

David Todd [02:19:57] Well, I hope our paths cross sometime soon. And it'd be interesting to hear what your next step is.

Tim Birdsong [02:20:05] Yeah, same here. And yeah, thanks for this project. This is an exciting project. I'm going to dig in further and listen to some of your other recordings.

David Todd [02:20:15] Thank you. Well, it's been good. Thank you so much. You take care.

Tim Birdsong [02:20:18] Thank you.

David Todd [02:20:20] Bye now.