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David Todd [00:00:02] Well, good morning. David Todd here. I have the privilege of being on the line with Dr. Chuck Sexton. And with his permission, we are planning on recording this interview for research and educational work on behalf of a nonprofit group called the Conservation History Association of Texas, and for a book and a web site for Texas A&M University Press, and then for an archive at the Briscoe Center for American History, which is at the University of Texas at Austin.

David Todd [00:00:34] And he would have all rights to use the recording as he sees fit as well. And I wanted to make sure that that sits well with Dr. Sexton.

Chuck Sexton [00:00:43] It certainly does, David.

David Todd [00:00:45] Great. Well, let's, let's get started. It is Wednesday, May 18th, 2022. It's about 10:25 in the morning, Central Time. My name, as I said, is David Todd. I'm representing the Conservation History Association of Texas, and I am in Austin. And I am fortunate, as I said, to be conducting a remote interview with Dr. Sexton, who is also based in the Austin area.

David Todd [00:01:12] As just a really brief introduction. Dr. Sexton trained in zoology and has worked in various capacities. He's had a stint with a private consultant, Espey Huston, and with the City of Austin, and with the U.S. Fish and Wildlife Service.

David Todd [00:01:28] He has broad interests. He's quite a linguist, but I think he spent much of his career in mapping and evaluating a variety of ecological resources, and in particular studying and protecting various kinds of wildlife, including butterflies and moths and a certain bird.

David Todd [00:01:45] And in fact, today we'll talk about that bird. We will hear about his life and career and focus on his work on behalf of the golden-cheeked warbler.

David Todd [00:01:56] So with that little introduction, I wanted to ask a first question, which is whether he could tell us about his childhood and early years, and if there might have been some people or events in his life that influenced his interest in animals and nature and protection of those.

Chuck Sexton [00:02:17] Well, hi, David. Thanks for inviting me to this interview.

Chuck Sexton [00:02:21] I had what I would consider kind of an optimal childhood for getting an introduction to nature. I grew up in Southern California. I grew up on a half-acre in rural

Orange County, California, which these days the term, "rural Orange County", would be something of an oxymoron. But it was quite open back in the day when I was growing up, and that half-acre was mine to hike around and study nature and enjoy the outdoors. So I had a great spot to be introduced to nature in terms of all of the plants and animals that I might have found on that half-acre.

Chuck Sexton [00:03:10] It was, there was a confluence of things in my early years that really may have set me on my pathway. It happened that my dad was a musician, among other careers, and he worked for a time at Disneyland. Disneyland was not far away, and so I ended up being very "Disneyfied", if you will, in my early years.

Chuck Sexton [00:03:38] And in particular, one thing I remember that was very formative for me in those early years: early on, in the late fifties, Disney produced a half-hour short movie, which was way ahead of its time with stop-action photography and slo-mo and all kinds of things, called, "Nature's Half-Acre". And I watched that and I realized, "Well, I live on a half-acre!" And it was just a wonderful introduction to what you can find on a half-acre. And that convinced me that I lived in the best place growing up that I possibly could. I also lived right near Upper Newport Bay, which would later become a nature preserve, and I had the opportunity to hike all over that place as well.

David Todd [00:04:31] Was there anybody in particular in those days when you were in Orange County who might have served as a guide or mentor or sort of somebody who encouraged this?

Chuck Sexton [00:04:44] Yeah, as with a lot of folks who end up in my kind of profession, I had a teacher in high school, a biology teacher by the name of John Johnson. Bless his heart, he was this wonderful elderly biology teacher who had gotten his degree at Humboldt State University - very patient, very good teacher. I actually met him prior to my high school years because he mentored me when I was doing my nature merit badge for the Boy Scouts. I met him before my freshman year in high school, and I had him for biology classes in high school and then I kept in touch with him even after my high school years. Very influential in promoting my interest in nature.

David Todd [00:05:42] And was there anybody in your family who shared this kind of interest or felt like they wanted to encourage that interest in you?

Chuck Sexton [00:05:51] Well, you know, growing up on that half-acre, I think my parents must have made a strategic choice. I never talked to them specifically about this, but to have grown up on a half-acre, which was a lot of elbow room for a young kid at the time, they certainly allowed me to wander all over that half-acre and collect rocks, and bring in plants, and collect butterflies and so forth. So they encouraged my interest in nature all through those formative years.

David Todd [00:06:24] So, did you have a terrarium or an aquarium or just a pile of rocks in your bedroom?

Chuck Sexton [00:06:32] Well, I would collect rocks on family vacations, and they would, they laid around the room or the house, and the backyard, I'm sure. I studied the plants, but it wasn't until high school years I really got into botany. But early on I was looking at bugs and making an insect collection, and a butterfly collection, and even started birdwatching in the backyard there. I remember having those early Peterson field guides at hand at home. So I was

both a collector and a classifier, if you will. I needed to know the name of everything in the yard.

David Todd [00:07:13] Interesting. Well, those seem like traits that have served you well.

David Todd [00:07:18] So this is jumping forward a few years, but I understand that you earned a B.S. in biological sciences in college with a focus on ecology and evolutionary biology from the University of California at Irvine, and then followed up with a Ph.D. in zoology, emphasizing population biology from the University of Texas in Austin. And, you know, again, just sort of that same set of questions come up in my mind is, is whether there were some classmates or teachers or other people during that period of your life, in school, who might have encouraged your interest in nature and science?

Chuck Sexton [00:08:04] Well, there was one particular event, or a course, a set of courses that I took at UC - Irvine. I always knew I wanted to be a biologist from early on. That was sort of a given in my pathway. But in my junior year at UC - Irvine, they had put together what they called the "Biology Super Course", which was basically four classes all associated around that theme of ecology and biology. And the instructors, it was four instructors and a couple of teaching assistants. We interviewed for that set of courses. And collectively, when I enrolled in that set of classes for my junior year, one semester there at UC - Irvine, we were all together for the whole semester. We would be in class for a week learning about something. Then we would be on a field trip for a weekend or a whole week. And that course and that class traveled to various places in all over California, down into Baja California, Arizona and Sonora, Mexico. And it was basically a crash course, an intensive course in ecology. And that was an incredible experience. And it certainly gave me a broad, rounded introduction to the vast array of topics in ecology.

Chuck Sexton [00:09:41] And I was, I guess I was singular minded. I, I'd never had much of an interest in studying anything else after that.

David Todd [00:09:50] Well, and is it fair to say that these were relatively early days of learning about the sort of ecological systems and the ties and connections? This is what, the late sixties, I guess?

Chuck Sexton [00:10:06] That would have been early seventies, yeah.

David Todd [00:10:10] Very sorry.

Chuck Sexton [00:10:10] You know, I'd already in my high school days had begun to put names on things. I'd begun learning botanical nomenclature and the names of butterflies and insects. And of course, just in being outdoors, you absorb the raw information about the habitats around you. But that course of work at U.C. Irvine basically gave me the context and the framework in which I could put all that information I was gaining, and that, that continued into my graduate career where I took ecology courses and had a set of professors on my dissertation committee that could give me that ecological context and guide me into what eventually became my graduate research.

David Todd [00:11:05] Hmm. Well, this may be a little bit of a detour, but I'm thinking about your earlier interest in Nature's Half-Acre. And, and I'm curious if there were any sort of episodes where in your life where you were interested in sort of popular culture, you know, the books and movies and TV shows and all the sort of, you know, artifacts that are in the sort

of public realm, not so much in in school or college or grad school, but, you know, that are available to all of us.

Chuck Sexton [00:11:46] Well, again, I have to mention, I guess, I would classify myself as being very Disneyfied. And in that sense, I was, you know, I followed the Mickey Mouse Club and went to Disneyland a lot. And of course, as every Disney film came along, whether it was about nature or anything else, that was obviously a must-see picture, whatever it happened to be. And so my framework of reference is based a lot on that, I would have to say.

Chuck Sexton [00:12:25] Another thing, another direction that shaped me in those early years is that I started surfing when I was in high school. I got to the beach in 1960 or '61, just before the Gidget craze and before surfing really took off. And I was an active surfer for a decade or more. And surfing, at the risk of getting off on a long tangent, surfing is also an introduction to the motion and the sounds and the movement of the seasons and the waves, of course. And that gave me, again, more context, more appreciation for nature and the outdoors and the sea. It's a minor miracle and a quirk of fate that I didn't end up in marine biology. I ended up in terrestrial ecology, but surfing and the ocean, and my interest in that may have even pulled me away from more of the popular culture that was all the rage in my high school and college years.

David Todd [00:13:40] That's really interesting, you know, the twists and turns that we take early in life and you know you always wonder about this sort of alternative history you might have played out.

Chuck Sexton [00:13:52] Yes.

David Todd [00:13:55] Well, thank you for sharing that with me. So you talked a little bit about your childhood and college and grad school and then the sort of popular world. Let's talk some about your, the start of your career. I think that you began your formal working life with a job at a well-respected consulting firm called Espey Huston. And I was curious how you got that first break to get a job with a professional firm like that.

David Todd [00:14:30] Well, it was a fairly common story at the time among my colleagues, and graduate students. In grad school there, or here at University of Texas at Austin. I had a four-year appointment as a teaching assistant, and that sort of paid the bills for a while. And I taught a few classes as I began to shop around and settle into the kind of graduate research I wanted to do and the topic I might go into.

Chuck Sexton [00:15:09] Well, I was slow to get on track for my graduate career. I sort of had begun thinking about studying birds and the impact of urbanization on birds. But the teaching assistantship didn't last. And so I found myself needing to get a job. And I think through some quirk of fate, I met someone who said, "Oh, well, Espey Huston is hiring and they love to have grad students who are interested in wildlife.".

Chuck Sexton [00:15:39] So I went and interviewed and got the job with Espey Huston, and that was another great introduction because they sent me, in my wildlife studies that I did for them, all over the state of Texas and beyond. So I got a good introduction to all of the wildly diverse habitats of Texas in that capacity.

Chuck Sexton [00:16:04] I got to mention they, they honored me with a great title when they hired me right out of school at just above minimum wage. They had me transferring raw data

from one scientist on their staff who was scribbling down numbers of diatoms on a piece of paper. And I took that piece of paper and transferred that to a computer.

David Todd [00:16:33] [Dr. Sexton, while we were talking earlier, we were rudely interrupted by the Gods of the Internet. But you were telling us about your work at Espey Huston and the task you had transferring data from scribbles to computer. Maybe you can pick up there.]

Chuck Sexton [00:16:52] Right, right. It's a silly story, but I just appreciated them giving me a big title of, "Manager for Data Reduction". And that was fine with me as an entry level position. So but that was a good, Espey Huston was a good introduction to a wide diversity of habitats across Texas. So that was a great introductory.

David Todd [00:17:29] Okay. Well, Dr. Sexton, you were telling us about your first foray into the working world with Espey Huston, a consulting firm in Texas. And I thought this might be a good chance to, to turn back just a few steps to your graduate career where, as I understand it, you were working on a dissertation at the University of Texas regarding the impact of urbanization on birds. And, you know, you had grown up in Orange County and seen a lot of development there. And then, of course, in Austin, where you were studying, the same sort of phenomenon was unfolding here in central Texas. And I was hoping that you could talk about what you started to learn about the effect of urbanization, sprawl and development, on wildlife in general, but in particular the golden-cheeked warbler.

Chuck Sexton [00:18:28] Yeah. Having moved from Orange County, California, to Austin, and having rampant urbanization follow me, I felt a little bit cursed, but it was an obvious choice for graduate research. And what became apparent early on starting my studies on bird life here in the Austin area and the impacts of urbanization, is the fairly self-evident aspects of urbanization. In urbanization, you lose habitat, you wipe out habitat, you change habitats. Urbanization introduces influences into whatever remains of the natural world that we as a species build into.

Chuck Sexton [00:19:19] And it was pretty clear from my studies that the wildlife and birds that were successful in urban settings were the species that could adapt. The species that had broad preferences could live almost anywhere or eat almost anything - like a house sparrow or a rock dove, and even native species, like a cardinal. But the more specialized the species was, the more likely that urbanization would impact that species. And that gets us into the habits of the golden-cheeked warbler.

Chuck Sexton [00:20:04] I had had the opportunity to see a short movie that was made by Red and Marjorie Adams called, "What Good Is A Warbler?", that they made in the mid-1970s. And I happened to sit through that movie as I was in the midst of my graduate research, and I thought, "Boy, the golden-cheeked warbler does not do well with urbanization." And so the golden-cheeked became sort of a cornerstone species, a canary in a coal mine, so to speak, for what I began to lay out as the broader impacts of urbanization.

Chuck Sexton [00:20:46] And so I had the opportunity during my graduate research to study and count and, and observe birds both in the city, the cardinals and the house sparrows and so forth. But also I had companion study sites out in the hinterland, in native habitats west of Austin, where the golden-cheeked warbler was often one of the most common birds in those remnant habitat patches. And that was a striking contrast and it gave me a good insight into what the golden-cheeked warbler needs and, and how specialized a bird it really is.

David Todd [00:21:31] Well, that's great. Maybe you can start us with a little description of your first encounter. I understand that you, you saw the bird in this "What Good is a Warbler" movie that was made in the seventies. But, but how did you first run across the warbler in the wild?

Chuck Sexton [00:21:54] Well, soon after I moved to Austin (I moved to Austin in 1974 to start my graduate career), and the first spring migration after that, in May of 1975, I was an active birdwatcher. Hadn't even settled on my graduate research yet. But I began birdwatching and going on field trips around the Austin area. And I just looked this up the other day: May 11th, 1975, I stumbled upon my first golden-cheeked warbler out at Pedernales Falls State Park, out west of Austin.

David Todd [00:22:36] And it was in, I guess, some juniper? What were the conditions where you found it?

Chuck Sexton [00:22:44] Right, Pedernales Falls State Park has excellent patches of good golden-cheeked warbler habitat, which is, are these dense cedar breaks with old growth Ashe juniper and the companion trees like oaks, Spanish oaks, live oak and so forth, that provide foraging substrate for them. So Pedernales Falls had some really good habitat patches for golden-cheeks. And I went there looking for them. And it wasn't a hard bird to find.

David Todd [00:23:18] Did you have some fellow birders who were along with you who might have been pointing you in the right direction?

Chuck Sexton [00:23:25] No. In fact, I did join many a field trip with Travis Audubon through the years. But on that particular day, I think I'd gone out on my own to Pedernales Falls to specifically chase down and add the golden-cheeked warbler to my life list. I knew what their song would sound like, and I still had young ears and I could hear their song. So I hiked the trail out of at Pedernales Falls, heard their song, moved towards the bird and found it on my own.

David Todd [00:23:59] Well, this is intriguing to me. I know that you're a very accomplished linguist and that your dad was a musician. And I'm wondering if you have had success birding by ear. Is that something that you're pretty practiced and skilled with?

Chuck Sexton [00:24:17] Right. And I think certainly in my younger to medium age, I had good ears for birding. And it may be related to those genes passed down from my father and his musical abilities. I don't have much in the way of musical abilities, but I have been able to learn a lot of bird songs and bird sounds. And in fact I do a lot of my birding by ear - "birdwatching by ear" - something of an oxymoron. But I do that a lot. And I'll walk through a given habitat, a given patch of woods, and I'll be probably paying more attention and devoting more of my brain cells to listening than looking. Each of us is different in that way.

David Todd [00:25:16] That's interesting. Well, and after you had first encountered the bird, I guess you've spent decades studying it, thinking about it, understanding its behavior. And I wonder if you could just give us a brief layperson's introduction to the life history of the golden-cheeked warbler.

Chuck Sexton [00:25:41] Sure, it's a very special bird, special to all of us. But in saying that, what we're really speaking of is ... it's an attractive little bird. It's a five and a half inch small

songbird that nests only here in central Texas. We get to say that every golden-cheeked warbler is a native Texan because their entire nesting range is encompassed within the Hill Country of central Texas.

Chuck Sexton [00:26:14] It's a migratory songbird. They migrate up into central Texas in March and April, settle into territories. They lay 3 to 4 eggs in a small nest that they build from juniper bark. And hopefully they're successful at raising some young. And they usually only make one nesting attempt, although there are some records of golden-cheeks nesting a second time.

Chuck Sexton [00:26:44] But soon after they raise those young, they've fed those young, those young grow up, and they head south quite early. Their migration starts in late June, early July, heading south towards their winter range. They migrate down through the mountains of eastern Mexico. And the winter range of the golden-cheeked warbler, where they spend probably as much as 6 to 7 months of the year, is from southernmost Mexico, in the state of Chiapas, and Guatemala, Honduras and Nicaragua, in pine / oak woodlands down there in Central America. So they're sort of a tropical warbler that graces us with their presence for four or five months of the year in their nesting season.

Chuck Sexton [00:27:38] They're an incredible habitat specialist, and that is both a joy to behold, but also it has gotten them into the trouble with their habitat, as we've seen. They require, for building their nest, they require loose strips of juniper bark. A lot of different birds might use juniper bark out here in the Hill Country as part of their nest structure. But the golden-cheeked warbler is an obligate user of that nest material, that loose bark from the juniper. And junipers have to be rather old, have to be 30 to 50 years old, before that bark starts shredding.

Chuck Sexton [00:28:22] So you have a situation that's as if one of us wanted to go find a home to start a family, and we needed a very specific type of architecture with certain building materials that we could only find in one location. And it would limit our choices of where we could live and raise a family.

Chuck Sexton [00:28:42] And that's the golden-cheeked warbler. They're not as adaptable as something like a cardinal or a blue jay.

Chuck Sexton [00:28:50] And for all of that, they are confined to the best of those habitat patches out there that contain the mature junipers, or cedars as a lot of folks call them, and the accompanying oaks and other hardwood trees that provide a lot of the foraging substrate for them. It turns out that the junipers themselves have some food availability and some bugs on the junipers. But more often the oaks and, and elms and other trees mixed in their habitat provide the dinner table for golden-cheeked warblers, the insect life that they, that they eat to survive and to raise their young.

Chuck Sexton [00:29:38] So the parental warblers work hard, raise a few young, and they fly away, and we hope to see them the next spring on their arrival.

David Todd [00:29:48] Interesting. Well. So how would you describe the ecological niche of, of the golden-cheeked warbler? How does it fit into that central Texas habitat, and of course, when it goes south to Mexico and Guatemala and Nicaragua, what's sort of role do you think it plays in the larger ecosystem?

Chuck Sexton [00:30:16] Well, it's, it's what we might call an indicator species, because it is a habitat specialist. It's an insectivore, as I mentioned. It's a habitat specialist in the choice of nesting material, in the choice of habitat blocks it uses, because it needs these patches of old-growth habitat. It needs large patches. A golden-cheeked warbler won't settle into just a small patch of a few acres that has a few old junipers and an oak tree nearby. They seem to need large patches of habitat to satisfy their habitat selection that they want. [Excuse me.].

Chuck Sexton [00:31:03] And so they're an indicator of the health of those old-growth stands of habitat that are still left in the Hill Country.

Chuck Sexton [00:31:14] One of the conundrums, as many people point out, Ashe juniper, cedar, is very, very abundant in the Hill Country still to this day. But those special conditions needed by the golden-cheeked warbler, the old-growth stands of Ashe juniper and the other oak trees in large blocks are what have become very rare with land use changes that we have wrought on the landscape.

David Todd [00:31:44] Well, this might be a good chance to talk about maybe the energy flows that I think you've, you've put the finger on as being one of the, the really key clues, I guess, as to understanding why urbanization has been such a problem for golden-cheeked warblers.

Chuck Sexton [00:32:10] Yeah, energy flow has been a topic of interest to me for many, many years. It comes from those studies of urbanization. One of the early studies of urban bird life: a fellow named Pekka Nuorteva from Finland, who did some early studies on bird populations over in Europe. And he made a sort of a casual comment. He said he noticed that there was a lot of transport of food and other materials into cities to support people and that birds literally and figuratively fed off of that. That was a transport of energy in the broader sense from the agricultural community around it into the city, and the birds benefited from that. But that would be the house sparrows and the rock doves and the other urban birds that could adapt to those habitats. And again, that gets back to being a generalist that can use that spillover energy flow from the human environment to their benefit.

Chuck Sexton [00:33:19] In the case of the golden-cheeked warbler, quite the opposite is the case. They have no benefit that they derive from urban influences. None of our city influences help them in their life that they lead, the food that they try to eat, or the nest they build, or raising their young. Quite the opposite.

Chuck Sexton [00:33:42] The energy of an urban environment in the form of noise and pets and increased numbers of nest predators like fox squirrels and blue jays all have negative impacts on the energy flow that golden-cheeked warblers are trying to accomplish in raising their young and successfully nesting.

Chuck Sexton [00:34:08] So urban influences have varied impacts on different species and for the golden-cheeked warbler, we've seen almost universally in studies that have now gotten into quite a lot of detail on their life history and their nesting habits urbanization is almost uniformly negative with respect to how it impacts the golden-cheeked warbler.

David Todd [00:34:41] Well, I think that a lot of the attention, as I understand it, for the golden-cheeked warbler decline in recent years has been on this this urbanization that's happened in Austin, San Antonio, New Braunfels and much of the Hill Country. But I understand that there's maybe a longer string of ecological trends, and ecological history, I

guess, for the Texas Hill Country. Is that something that that you might be able to tell us about and what the golden-cheeked warblers' trends have reflected from that?

Chuck Sexton [00:35:26] Going back, that's very true. The problems for the golden-cheeked warbler probably did not just start with the rapid urbanization of the Austin - San Antonio corridor in the 1970s or eighties or nineties.

Chuck Sexton [00:35:46] One of the early major studies of the golden-cheeked warbler was done by Warren Pulich, Sr., and he wrote a book that was published in 1976 that surveyed all of the knowledge about golden-cheeked warblers that we knew at the time. And even in the mid-'70s, Dr. Pulich was very concerned about habitat loss that had already occurred. He pointed out the impact of urbanization in the rapidly growing areas like Austin, but he was concerned about wholesale land clearing for common agricultural practices, particularly livestock production in the Hill Country - cattle, goats, sheep - that had been the impetus for the clearing of tens of thousands of acres of old-growth habitat.

Chuck Sexton [00:36:43] And it goes back even further because there was an whole industry dating back into the late 1800s and early 1900s of a product called, "cedar posts". Fence posts that were supplied to much of the country came from Ashe juniper that was cut in the Hill Country. And where extensive stands of that was cut through those early decades, golden-cheeked warbler habitat was lost. And so the landscape has been changing for the last hundred, 150 years for not just urbanization, but all of the land uses that we have used the landscape for. And that habitat loss, as is the story for so many songbirds, habitat loss is the primary impact causing a population decline in the golden-cheeked warbler.

Chuck Sexton [00:37:44] One of the ironies is that, as people have pointed out, Ashe juniper is now probably as abundant and widespread as it ever was, or more so. But, it's widespread because of some of those land use changes we have wrought. The overgrazing which, and the fire suppression, which caused or allowed Ashe juniper to invade uplands and pasture land and agricultural lands and escape just the steep canyonlands where it had been confined in eons past by natural fire. So Ashe juniper has become more common, but those old-growth stands that the golden-cheeked warbler needs have become rare as hens' teeth.

David Todd [00:38:36] Thank you for explaining that.

David Todd [00:38:40] You know, while we're talking about this encroachment of of junipers, it might be worth just touching on the, the whole controversy of what the Hill Country once looked like. And I think there is, as I understand it, there's been a debate about whether juniper were common in the past or, you know, whether there was, you know, extensive grasslands in the Hill Country. Can you help us sort out what this landscape might have looked like prior to Western settlement?

Chuck Sexton [00:39:17] Yeah, I was a young boy back then.

Chuck Sexton [00:39:21] Well, you know, as with any, almost any, ecological topic, or any topic of that sort, there's been a lot of oversimplification. Were there grasslands in the Hill Country? Certainly. I've read some of those early accounts dating back to the mid to late 1800s where the early explorers would ride through areas of central Texas and have prairie grasses up to the belly of their horse. I can believe that, because the plateau tops and the more level country was probably a grassland, a native prairie that was maintained by periodic natural

fires, fires set by lightning or Native Americans, that kept that grassland in an open setting in much of the level terrain.

Chuck Sexton [00:40:18] But predominantly those fires would not move into or move through the steep, rugged canyon lands that is so characteristic of much of the Hill Country. The fires just won't burn rock, and so the fires would go out at the edge of canyon lands, and that is where the stronghold of Ashe juniper would have been.

Chuck Sexton [00:40:41] We have good evidence from detailed studies of the chemistry of these junipers that Ashe juniper was here tens of thousands of years ago. And the likelihood is that the best of the stands of Ashe juniper were confined to those steep terrain, steep slopes, steep canyons where fire wouldn't penetrate.

Chuck Sexton [00:41:06] And then as we overgrazed the landscape and removed those dense prairie grasses, that allowed an opening for Ashe juniper to spread across the landscape and colonize those upland areas where it might not have occurred naturally with a regime of fire.

Chuck Sexton [00:41:29] So, were there dense cedar breaks here? Yeah. Were there dense grasslands? Yes, as well.

David Todd [00:41:38] Well, thanks for straightening that out.

David Todd [00:41:41] You know, something else you mentioned, I think in passing about ... that maybe figures into the golden-cheeked warbler was the role of of some of these more parasitic birds or I think you mentioned fox squirrels and blue jays, and I, I think I've read about the, the impact of brown-headed cowbirds.

Chuck Sexton [00:42:05] Yes.

David Todd [00:42:06] Have they been significant for the, the warbler?

Chuck Sexton [00:42:10] Well, early on, it was recognized that the brown-headed cowbird, which is a parasitic songbird, that the female cowbirds lay their eggs in the nests of other species and lay those to be raised by the foster parents to the detriment of the native chicks of that species. Brown-headed cowbirds do parasitize golden-cheeked warblers.

Chuck Sexton [00:42:34] Early on, Warren Pulich, in those early studies, recognized that the parasitism was present in golden-cheeked warblers. But even at his time, and in subsequent studies, we were still not sure that it has a fatal impact on golden-cheeked warbler nesting. We know that other songbirds, certain other songbirds like the black-capped vireo and other open-nesting songbirds get hit pretty hard with the cowbird populations. The cowbirds lay their eggs in the nest. The other songbirds raise only cowbird chicks and not their own. So it can be an extremely negative impact on open-nesting songbirds.

Chuck Sexton [00:43:21] But for reasons we still don't quite understand, the golden-cheeked warbler isn't hit as hard. It is parasitized. Nests are parasitized, and sometimes you can lose a lot of nests to cowbird parasitism, but it seems not to be as hard and harsh an impact on the golden-cheeked as it is with other songbirds.

Chuck Sexton [00:43:44] It's a concern. It's something that land managers take into account. And there is cowbird-trapping that's done to moderate cowbird populations in areas where they're trying to protect golden-cheeked warblers.

Chuck Sexton [00:43:58] But happily, it's not, perhaps, not the worst impact that they face.

David Todd [00:44:06] Okay. Well, you've, you've run through a number of different factors that I guess would have affected the populations of the golden-cheeked warbler from, you know, the cutting of fence posts, to the suppression of fire, to the overgrazing and clearing related to that for cattle and goats and sheep, and then some of these parasitic problems with cowbirds.

David Todd [00:44:37] Is there anything else that that you might point to that might've been responsible for the decline of the warbler?

Chuck Sexton [00:44:45] Well, the impacts that we've seen on the landscape are sometimes subtle. They're not as overt as just losing a patch of habitat, which certainly urbanization can cause. One of the more subtle and dangerous impacts of urbanization, and human activity in general, are these secondary impacts, what we call, "edge effects".

Chuck Sexton [00:45:14] So, you could, for instance, build a subdivision up to the edge of a good patch of habitat. Let's assume that your subdivision went into a nice plateau top where you didn't even have to take out any golden-cheeked warbler habitat. And you build your subdivision right up next to a canyon that has juniper-oak woodlands and a thriving population of golden-cheeked warblers. Unfortunately, there are a variety of spillover influences of urbanization that aren't confined to those fence lines, at the back lot lines of that subdivision.

Chuck Sexton [00:45:53] So, these are things like noise, and we don't fully understand how much of an impact noise can be on something like a golden-cheeked warbler, a bird that sings to defend its territory. We know that urban areas, from my own research, urban areas, suburban areas, support high densities of birds like blue jays and other animals like fox squirrels that I mentioned, which are both nest predators. And those won't be confined to your yard. So as you live in your subdivision and raise a lot of blue jays and fox squirrels and other potential nest predators, those nest predators can spill over into the habitat and have an impact on the nearby portion of otherwise optimal golden-cheeked warbler habitat.

Chuck Sexton [00:46:51] And some of these aspects have been studied in detail right here in Austin, and we know that those influences of urbanization, even when you don't have actual habitat loss, those edge effects can extend 100, 200 meters into good habitat.

Chuck Sexton [00:47:11] And that's part of the reason why we've always hoped to protect habitat in large patches so that we not only have enough habitat for a lot of birds, but that we have core habitat that is hopefully out of the reach of those influences of the adjacent urbanization.

David Todd [00:47:32] That's really interesting. So there needs to be some sort of a buffer because I guess there's not really a, a bright line between good habitat and, you know, a piece of developed land.

Chuck Sexton [00:47:46] Right. It's not an easy line to draw. And these influences are diverse and subtle, and it's still something these land managers in and around the Austin area, and urbanizing parts of the Hill Country, are struggling with is how to minimize these influences of we humans in all of the things that we cause to happen on the landscape, even as we have protected a plot of land.

David Todd [00:48:19] It's, it's really intriguing. It's a puzzle. You know, although sad, that it's such a life-and-death riddle.

David Todd [00:48:30] So my understanding is that because of these impacts that you've gone through, there's also been an effort to try to protect the birds, and that the bird was listed under the Endangered Species Act as an endangered creature, I believe, in 1990. But there were some steps along the way, a Category 2 listing in 1982, and, and then Warren Pulich's studies back in '76, which I think rang the bell as early as that.

Chuck Sexton [00:49:08] Yes.

David Todd [00:49:08] Can you talk about these, these steps towards listing and the identification of the, the need to protect the bird?

Chuck Sexton [00:49:16] Sure. Travis Audubon Society, here locally in the Austin area, had long recognized the need to try to protect golden-cheeked warbler habitat. And then they started off with a preserve over west of town, a fairly small preserve that has expanded somewhat. And they had been trying to educate the public through the fifties and sixties and seventies. Membership of Travis Audubon has been raising that red flag about the decline of the golden-cheeked warbler. And then Pulich's studies in the sixties and seventies, published by Texas Parks and Wildlife Department, really gave us a broad overview, and a detailed overview, of how much habitat was being lost. And so that was published in 1976.

Chuck Sexton [00:50:08] And as we went through the late seventies and early eighties into the mid eighties, and urbanization was increasing rampantly in the eastern edge of the Hill Country, right where the best blocks of habitat for the golden-cheeked warbler existed. It was a, it was a train wreck ready to happen. And so that rapid urbanization in the Austin area and the decline and the loss of habitat for the golden-cheeked warbler brought all that to a head in the late 1980s and initiated those steps, those formal legal steps, to have the warbler listed as an endangered species under federal law.

Chuck Sexton [00:50:56] And of course that initiated the whole fracas that we now look back on and call the "Warbler Wars", which was unfortunate and perhaps unnecessary, but it created a lot of tension in Texas, and in the Austin area, when those competing interests came head-to-head.

David Todd [00:51:23] And you know, I've heard about some of the features of the Warbler Wars. I think there was a effort to dismantle the Natural Heritage Program at Texas Parks and Wildlife. And there was resistance to having state and federal biologists visit private lands where these warblers might be found. And, and then on the other side, there's this, I guess, effort to develop the Habitat Conservation Plan. So efforts on both sides pushing and pulling on the warbler.

David Todd [00:52:01] What do you think the reason was for how intense these, as you put it, Warbler Wars grew? It was really, I guess one way to put it, it was exciting.

Chuck Sexton [00:52:14] Yeah, well, exciting is one word for it. I found myself stuck in the middle of a lot of that, to my own detriment. But it's probably the big question left for historians. And there have been books written about it, both the warbler and the efforts to protect the species. I'm not a historian and not a politician, but a lot of it probably, I would guess, from a biological view, a lot of it is derived from long-term attitudes - political, social and personal attitudes - that epitomize Texas, both good and bad, and the strong independence of the Texas spirit. And the fact that Texans and Texas politicians and landowners, probably as a general rule, would not look favorably on federal regulation of anything they do. I can't speak for all Texas landowners or all Texas politicians, but I might just assume that as a backdrop to what began to happen here in central Texas at that time.

Chuck Sexton [00:53:31] And the golden-cheeked warbler sort of got under their skin because the private sector, the development sector, at that time was moving so fast and so furiously. In my opinion, from my research and my studies, I can tell you that the real estate market was not including the environmental costs of development in their plans. And so they weren't protecting habitat. They weren't recognizing in the marketplace that there was a negative impact on rare species, whether it was golden-cheeked warblers, or some cave bugs over west of Austin in some small caves there. And the market place wasn't, and isn't, built to...

David Todd [00:54:29] Okay. Right. Well, let's, let's resume. We had a little break there, but Dr. Sexton was telling us about how these Warbler Wars might have originated, and, gosh, just the, the culture and sociology and the sort of individual rights traditions of Texas that..

Chuck Sexton [00:54:48] Yeah.

David Todd [00:54:49] That might have been expressed in the how the real estate market operated in central Texas, and just discounted these rare creatures pretty poorly. Can you pick up where you left off?

Chuck Sexton [00:55:03] Right. It, I think it's generally the nature of a free market systems that environmental factors, environmental costs, aren't necessarily taken into account in the valuation of property and the valuation of real estate deals. And so when that hot real estate market of the Austin area, for instance, really heated up in mid-eighties, there was not a consideration in the marketplace, of both the needs of species out there in the habitat and the environmental costs that it might take to protect those values that some of us in the population did recognize. And so there was that natural conflict between a raw real estate market and the difficult-to-value aspects of species and habitat conservation.

David Todd [00:56:23] So do you think that that part of it was just not just the costs of setting aside habitat, but also the uncertainty of how much habitat would be enough, what kind of measures? You know, that there was some sort of lack of precision there? Was that a problem?

Chuck Sexton [00:56:48] Well, science always advances its state of knowledge. And it is a true criticism, a proper criticism, that in those early days of these conservation efforts, we didn't have a full portrait, perhaps, despite Warren Pulich's work, and others. We didn't have a full portrait of what the golden-cheeked warbler needed, the black-capped vireo, what it needed, cave bugs, how widespread or how rare they were. So all of those things required some fast study with a steep learning curve in trying to get that information.

Chuck Sexton [00:57:31] And that was part of the effort that we put together for when we got into the community effort called the Balcones Canyonland Conservation Plan, of which I was a part. We quickly recognized the need to pull together all the information we had and to get right there at the vanguard of whatever we knew so that we could put together a plan and inform the decision makers of what the species and habitat needs were.

Chuck Sexton [00:58:06] So, we brought together for that Plan whatever we could find. And the knowledge of the golden- cheeked warbler was sufficient at the time, even though population estimates were a bit vague and the same for the black-capped vireo. We did the best we could with the best science available, as you always do, and offer that up as a backdrop and as the biological report that served as the foundation for all of those community efforts. And that was something that I was deeply involved with through the late eighties and early nineties.

David Todd [00:58:47] I see. Well, so, you worked for the City of Austin, let's see, from '88 to 94.

Chuck Sexton [00:59:00] '84 to 94? Yes.

David Todd [00:59:01] '84 to '94. My apologies.

Chuck Sexton [00:59:03] Yes.

David Todd [00:59:03] And so, a lot of this work on developing the Balcones Canyonlands Conservation Plan was going on at that time. And I think you've sort of led us up to the brink there about trying to collect information and put together a plan on what the species needed. And I guess you're doing range and population estimates at the same time. What were some of the sort of highlights of that, that effort to develop the Conservation Plan?

Chuck Sexton [00:59:35] Well, that, you know, that's worthy of several books, but I'll try to encapsulate it briefly. When I was on staff as an environmental specialist there at the City of Austin's Environmental Department, my boss, Austin Lebrock, and I recognized that we were, we were begging and pleading with a developer, ABC or XYZ, to try to set aside a canyon here to protect the hillside there piecemeal in that rapidly developing scenario. We knew that wasn't working.

Chuck Sexton [01:00:09] And then Austan Lebrock, to his great credit, heard about something called a Habitat Conservation Plan. We, along with a couple of other colleagues, went to the Fish and Wildlife Service and tried to figure out how you do a Habitat Conservation Plan. And we initiated that in 1988. The Texas office of U.S. Fish and Wildlife Service had never even done such a thing, so they were scrambling to figure out how to do it.

Chuck Sexton [01:00:40] And we quickly brought in a bunch of partners - the Nature Conservancy, Travis County, City of Austin, other landowners and interested parties - and brought together all the stakeholders to begin that process of developing what would become a multi-species regional Habitat Conservation Plan. That quickly burgeoned into a major, and eventually a successful effort. The permit for the Plan was eventually issued in 1996 after a lot of wrangling on how to pay for it all. And all founded on those biological studies we had done in the early years of that planning effort. And that plan now has served as a model for any number of other Habitat Conservation Plans around the country.

David Todd [01:01:37] Well, so, I'm sure there was a technical side to this, trying to understand this bird and its habitat needs, and then a political side to bring in these partners and then this ...

Chuck Sexton [01:01:50] Sure.

David Todd [01:01:50] Economic aspect of how do you pay for it? I mean, this land is terrifically valuable. I think you've talked about some of the technical side. Can you maybe give us some examples of how these, they're not competing agencies, but they're agencies with maybe conflicting or overlapping jurisdictions, how you brought those folks together, and then also the aspect of how to collect the money to, to purchase this land.

Chuck Sexton [01:02:22] Well, let me talk about the partners first. Many of these partners, the major partners, that worked to move the plan forward, were entities like the City of Austin, Travis County, Lower Colorado River Authority, all of whom had lands on the west side of Austin that were recognized by the biological team as being suitable and viable as potential units of any conceivable preserve system. So they were land owners in the literal sense that they would be able to contribute lands to any eventual preserve system.

Chuck Sexton [01:03:06] There were private landowners. There was the Nature Conservancy itself, which owned land, and Travis Audubon, which owned land, and other private landowners in the mix, all of whom were in a position to, in a sense, designate all or parts of those habitat blocks as part of the preserve system.

Chuck Sexton [01:03:28] Then it got around to all the other land that we needed. That biological report for the Plan targeted over 30,000 acres of habitat that needed to be protected for a successful plan in the area immediately west of Austin. And a lot of that was in private holdings.

Chuck Sexton [01:03:51] And I wish I could speak intelligently to the different avenues we investigated to try to pay for land acquisition. There are mitigation fees that were set up where a developer who wanted to develop a certain amount of land would pay into the mitigation fund and that fund would go towards the purchase of other lands that were targeted for the preserves. That was a fairly direct way of doing it.

Chuck Sexton [01:04:20] Then there are other financing mechanisms that were involved that are way over my pay grade in order to set up the funds for managing those lands, for instance, and staffing the preserve staff that needed to be on the ground to protect and manage the lands eventually that were created to create these preserves.

Chuck Sexton [01:04:47] So, it took a city, it took it took a whole community, to put that into place.

Chuck Sexton [01:04:55] I happily, I, I don't claim to be an economist or a politician, so I can't speak to a lot of, all of the efforts that went in on those sides of it. But biologically, we're proud of those efforts. I'll speak later to the efficacy of it all, but it was a community effort for sure.

David Todd [01:05:21] So, you spent a decade at the City...

Chuck Sexton [01:05:25] Yes.

David Todd [01:05:25] Pulling together this Conservation Plan and helping develop it and put it into place. What about the, I guess, the subsequent years you spent from '94 to 2010 where you were the wildlife biologist for the U.S. Fish and Wildlife Service at the Balcones Canyonlands National Wildlife Refuge. And it seems like you kind of switched gears from organizing something, developing it, to actually implementing it and managing the land, monitoring the birds. Would you talk about that, that next phase?

Chuck Sexton [01:06:04] Yeah, I had a blessed career in the, in the form of my pathway. In the process of putting together that plan, the Balcones Plan, one of the elements that was identified was the need for a big habitat block to be protected out in northwest Travis County and surrounding areas. And through the efforts of Congressman Jake Pickle that became a National Wildlife Refuge with federal funding. And the Refuge itself is basically part of the overall plan, the dream, if you will, of that biological team on how to protect these species in the Austin area.

Chuck Sexton [01:06:55] [Excuse me.]

Chuck Sexton [01:06:56] You had the local partners taking care of the areas within and close to Austin. Then the Fish and Wildlife Service was taking care of establishing a National Wildlife Refuge out in the hinterland. Well, the Refuge was established in 1992 and they hired a manager, Deborah Holle, and a first biologist. And come to pass, after just about 1 to 2 years, the first biologist for the Refuge decided he wanted to go elsewhere and pursue other parts of his career, and the position as a wildlife biologist at the National Wildlife Refuge opened up.

Chuck Sexton [01:07:36] And so I raised my hand and said, "Pick me, please." So I transitioned from being the biologist at the City of Austin that helped create, and set the stage for that Refuge, to being the wildlife biologist at the Refuge, and that involved jumping into being a federal employee with all that entails. But I did spend that career, 16 years with the U.S. Fish and Wildlife Service, designing, helping to build and helping to monitor and manage that Refuge.

Chuck Sexton [01:08:13] It increased in size through the course of that 16 years. It started off with the purchase of just a few tracts of land out there past Lago Vista in northwest Travis County. And I helped advise the realty staff that was actively negotiating with landowners out there. It was all acquired on a willing-seller basis to figure out which pieces we could add to the Refuge in the grand design. So I was advising the realty staff on what would be good to buy and what the best habitat patches were.

Chuck Sexton [01:08:54] And then also, of course, in the spring time, from March through July, I had the task of spending my time monitoring and mapping golden-cheeked warblers, and that certainly gave me a continuing presence in and around that species, which again I'd already been studying for a couple of decades, but it was, again, immersing myself in their habitat and their life history on a very intimate level.

David Todd [01:09:32] Well, you know, that whole effort of monitoring these birds is, I'm sure, easier said than done. I gather they're, they're pretty elusive birds. You have to get, you know, deep into the woodlands, the thickets of junipers.

Chuck Sexton [01:09:48] Yes, dense habitat. Yes.

David Todd [01:09:51] Yeah. And so I was wondering if you could talk about the efforts to monitor these birds. What did that entail? And then, you know, the, I guess in the last five or six years, there's been a lot of controversy about the, I guess, the robustness of the monitoring and the ability to model and extrapolate from one sample to a larger population.

Chuck Sexton [01:10:19] Population estimates, right?

David Todd [01:10:19] Yes. Could you talk a little bit about how those population and habitat ranges are figured out?

Chuck Sexton [01:10:27] I will. I'll start you off with a typical spring day for me when I was in the midst of my warbler monitoring. Those were certainly some of the most fun times I spent at the Refuge. On a typical day, weather-permitting, what I had was a set of study sites - hundred-acre plots that I had established in good warbler habitat in various areas of the Refuge out there.

Chuck Sexton [01:11:00] And the task each spring was to do what we call territorial mapping. So we'd take (this is the traditional scientific effort of sub-sampling), where we take a sample of some species and monitor it closely. And then we try to extrapolate that more widely. So my typical day would be to go hike out to one of these hundred-acre plots, and spend as much time as I could walking quietly through the habitat, listening for the sounds and songs of the golden-cheeked warblers, mapping where those territorial males were singing to see how many different territories I could delineate.

Chuck Sexton [01:11:46] Looking for the female warblers who are much quieter and harder to detect. But that gives us some information about their mated status, and at times looking for nests, although that's another level of difficulty higher to try to look for and monitor nests. Honestly, I did not do much of that. I would make note of nests if I found them. But golden-cheeked warblers build that nest out of juniper bark, often on a juniper tree. So finding a golden-cheeked warbler nest is very, very tough. And I admire those field biologists who have the knack of finding those and taking the time to monitor the nesting activities.

Chuck Sexton [01:12:31] But my actions, my activities, were primarily geared towards getting a population number, a population density, on my sample plots. And then I would get back to my office and organize my data on that set of sample plots, and also pore over aerial photography and satellite imagery of the Refuge, map out what I could tell was good blocks of warbler habitat, and then extrapolate my knowledge of the numbers of birds onto those habitat maps, and come up with some estimate of the number of birds we had on the Refuge.

Chuck Sexton [01:13:17] That estimate for the 10 to 20,000 acres of Refuge that I was working on amounted to something like 600 to 800 nesting pairs of golden-cheeked warblers, from my sample plots, that any one of those sample plots might have had only 10 to 20 pairs. But combining my knowledge of the density of the birds and the amount of habitat, you can extrapolate a population count.

Chuck Sexton [01:13:47] That, in a broader sense and a bigger view, is what we all have been trying to do to fine-tune our estimates of how many golden-cheeked warblers are there. The big question - how many are there and how are they doing?

Chuck Sexton [01:14:03] The subtleties come in with the difficulties in mapping habitat and also gauging population density of warblers, not just in the best habitat like I had available to

me, but populations that were in mediocre habitat, populations of warblers that took up home in marginal habitat, and figure out areas that absolutely are not warbler habitat. Well, those are tough questions. And depending on how you calculate, or how much good habitat you have, how you estimate the density, the number, you multiply that by for gauging how many warblers will be in a block of good, bad, or ugly habitat.

Chuck Sexton [01:14:55] That's when you can get these rather wildly divergent estimates of a population. It's all a bunch of field biologists and scientists doing the best they can with the tools available to get the best information. But those tools and those techniques differ from one office to the next, from one research group to the next. And we come up with different answers.

Chuck Sexton [01:15:22] And that's the conundrum we've faced recently when researchers from one office went through their own habitat estimates and estimated a rather large number of golden-cheeks, which was ten-fold or twenty-fold higher than anyone had ever estimated previously. And we were all scratching our heads, trying to figure out how much truth there was to that, and other researchers coming back and saying, nope, it's not that big. And so we get into these scientific arguments, pleasant, polite, professional arguments. But of course, that spills over into the policymaking realm.

David Todd [01:16:08] Yeah. And, and I guess you can have good-faith disagreements, but the consequences are really high. Yes.

Chuck Sexton [01:16:17] Yes, they are.

David Todd [01:16:20] You know, that was something I wanted to ask you about. I think that some of these high numbers have been used in arguments to down-list the golden-cheeked warbler.

Chuck Sexton [01:16:32] Yes.

David Todd [01:16:32] And I was curious if you could talk about those efforts and whether you think they're valid or not. I mean, what do you think the status of the bird is and the prospects for the future?

Chuck Sexton [01:16:46] Well, that's the $64 question. I have some first-hand familiarity with the researchers that proposed the high numbers of warblers. I saw (this was towards the end of my career at the refuge), but they were sending field teams out to the Refuge and a variety of other locations to map habitat in a different manner than I had to extrapolate numbers and so forth.

Chuck Sexton [01:17:20] I reviewed some of their early work. And frankly, I did not find it supportable. And when they came out with their published reports, I offered my internal critique of that work within Fish and Wildlife Service and to some of our other researchers in the Austin area on what I thought was good and bad and flawed with that research. Their estimate, in my opinion, was way too high. And I outlined those reasons.

Chuck Sexton [01:17:55] Basically, to oversimplify a lot of arcane arguments about habitat and population estimates, we generally feel, at least some of the Austin researchers generally feel, that the high population numbers came from extrapolating too many birds, too high a density of birds, in habitat that was marginal at best, or not even good habitat.

Chuck Sexton [01:18:22] So our methodologies differ and those estimates differ. But that high estimate, because it was so high, it prompted a reaction among the political and economic realms that suggested that the warbler was doing fine and could be de-listed.

Chuck Sexton [01:18:44] Not so fast. In my opinion, it is not worthy of de-listing at this point in time because those population estimates were flawed.

Chuck Sexton [01:18:54] What's the exact population of warblers? I still don't know to this day. And happily, I've been retired for some years. I'm out of the fray a little bit, but I know there are good people and good scientists working on refining those estimates to really gauge how the warbler populations are doing right now.

Chuck Sexton [01:19:15] And until we settle on that, the warbler is still at risk. Habitat is being lost. If it were to be de-listed, it would take away protections. It wouldn't cause protected habitats to be removed, but it would de-emphasize the continuing need for protection of the warbler and management of warbler populations.

Chuck Sexton [01:19:40] So, it's very premature at this point in time to de-list the warbler. We still need to get those population estimates better refined.

Chuck Sexton [01:19:52] But there are bigger questions than even just the population numbers. That misses the biggest questions. And that is what's, what's the long-term fate of the golden-cheeked warbler? You didn't exactly ask me that, but I'll jump into that topic, if I may.

Chuck Sexton [01:20:10] It's, it's a question of the large-scale impacts that we have beyond just habitat loss from, say, urbanization. It's climate change, and what that might do to a habitat specialist like the golden-cheeked warbler. The golden-cheeked is a habitat specialist that has very narrow requirements for the kinds of habitat it likes and the kind of habitat it can nest successfully in.

Chuck Sexton [01:20:44] Climate change is projecting that the Hill Country and central Texas is going to heat up and get drier. It's very, very hard to predict exactly what changes that will effect on the landscape. But we can imagine that good warbler habitat will decline and woodlands would be, might not grow as well here in the eastern edge of the Hill Country. It might be drier, it might be more open.

Chuck Sexton [01:21:19] That's less good for the warbler and things like their potential food resources, those bugs that grow on the oaks and the junipers - the populations of those may change. They may decline there.

Chuck Sexton [01:21:34] The seasonality of the flush of growth that supports the nesting warblers may change by days or weeks, emerging later or peaking later. And the question is whether or not the golden-cheeked warbler can adapt fast enough to those changes on the kind of time scales that we are expecting.

Chuck Sexton [01:21:59] And it gets to even more subtle things like not just how can a warbler that lives four or five years adapt to trees that are leafing out later or bugs that are hatching out later, but what do they have in their genetics? What are the genetics of the golden-cheeked warbler that might allow them to adapt to those changes? And there have

been some genetic studies headed up by Dr. Giri Athrey and his teams of people who have looked at the genetic diversity of golden-cheeked warblers. And this is the very grist that ecology and the evolution of the golden-cheeked warbler is going to depend on going into the future. What they found was a little bit alarming. They found that there is not much genetic diversity in all of the populations of golden-cheeked warblers. That does not bode well for golden-cheeks being adaptable in the long term.

Chuck Sexton [01:23:05] I can't rule it out. I can't rule it in. But any population of a species that has low genetic diversity is at risk from an evolutionary standpoint in being able to adapt to change. And that is the deepest worry that I might have about the golden-cheeked warbler, is that maybe on a short-term basis of several years to a few decades, they might adapt to changing habitats and flowering plants and bug emergences. But do they have it in them genetically to really survive in the long term, if our habitats, if their habitats, change drastically over a period of many decades.

David Todd [01:23:58] I see. So I guess in a nutshell, the birds are real specialists and they have really discriminating needs.

Chuck Sexton [01:24:07] Indeed.

David Todd [01:24:07] And maybe their diversity isn't enough to adapt if those, you know, their needs don't fit the habitat where they are, or the seasonality. Gosh.

Chuck Sexton [01:24:20] Yeah. They say that nature is not only more complicated than we think; it's more complicated than we can think. And that's the ... I'm, I've got to tell you, honestly, I would say I'm cautiously optimistic about the status of the golden-cheeked warbler because we've made significant efforts to protect their habitat, and we're making major efforts to manage that habitat in much of the range of the species. But there is that undercurrent of negativity about concerns about their genetic makeup that still has me on the edge of my seat.

David Todd [01:25:03] Right. Well, let's talk about some other aspects of your career that that overlap to some degree with the golden-cheeked warbler, but maybe bring in some of your other interests and experiences.

Chuck Sexton [01:25:20] Sure.

David Todd [01:25:21] One thing that I was really intrigued to learn about you is that while you have been a professional with paid work in the conservation field, you've also served as a volunteer. And I would love to hear your thoughts from your experience at the Austin Environmental Board and its Nature Preserves Task Force. And just if you have any comments that you could share about that role of volunteers, you know, public citizens who pitch in to help advise city government.

Chuck Sexton [01:26:00] Yeah. That was a very fun part of my career to be able to help out. I mean, fundamentally, I knew that from my graduate research and my graduate career, I was not on a track to be a teacher in a formal sense. But I always thought that the conveyance of knowledge accrued during the course of science to the broader public was so important to guide decisions. And I had those opportunities.

Chuck Sexton [01:26:39] I served for a few years on the City of Austin's Environmental Board, advising on local issues of habitat protection. Back in the day, this was the early eighties, before any of these major efforts had started. So there were voices, my own and others, advising the City decision-makers on what they might try to accomplish. And that was fun to do that at the time.

Chuck Sexton [01:27:11] I served on a Nature Preserves Task Force, as you mentioned, in the early eighties. For a couple of years, the City of Austin had passed a $5 million bond issue in about 1981 or '82 and then set up a citizens' task force to help guide the expenditure of those bond moneys and target those towards important habitats. Most of that money turned out to be targeted, at the time, towards protecting habitats in central and east Austin, and including some remnant prairies and other habitats that are in the middle and eastern part of the Austin area. And then it was only later from efforts on the Balcones Plan that we focused in a big way on the cedar breaks on the west side of town.

Chuck Sexton [01:28:09] The Nature Preserves Task Force is near and dear to my heart for a number of reasons, not the least of which is that I met my wife on that Task Force. So, she is a nature nut like me. And we had the opportunity to both learn and advise the City of Austin about the needs for the habitat around the City of Austin, but also to advise decision-makers at that time.

Chuck Sexton [01:28:36] And honestly that's, even now in retirement, you have in your notes about iNaturalist. And that brings me full circle back to my volunteering days. Now in retirement for over a decade I've become very involved with iNaturalist, which is this citizen science organization, a website, a community, where it's people basically documenting plants and animals around the world, uploading them to this web site of iNaturalist, sharing that information, sharing that with each other, helping each other identify things, sharing that with the scientific community. And it has become probably the fastest-growing and perhaps the largest citizen science nature-focused group of people anywhere right now.

Chuck Sexton [01:29:36] And I'm really proud to be very active in that, because that allows me to keep my fingers in the pie of nature study and, and offer some help in a broader sense, not just with the golden-cheeked warbler, but birds and bugs and plants and moths and everything I'm interested in.

David Todd [01:30:01] That's great. It sounds like not only a wonderful source for data about the natural world, but also just a community of people with like-minded interests and concerns.

Chuck Sexton [01:30:15] It is indeed.

David Todd [01:30:18] Well, one last thing, which I think is, is another way to maybe join up with people who care about the natural environment. I think that you had worked at one point leading tours for the Balcones Songbird Festival, and I was hoping you could talk a little bit about your interaction with some of the people that you guided during the Festival.

Chuck Sexton [01:30:41] Sure. That was one of my fun duties in in the spring time. I would be busy with monitoring our golden-cheeked warblers and black-capped vireos, but we had the idea to create a birding festival. They were beginning to become quite popular in the 1990s, and so in 2001 we organized the first Songbird Festival centered at the Refuge and centered, based out of Lago Vista. Lago Vista, as a community, jumped in and was very supportive and

always has been supportive of the festival. That offers us an opportunity to schedule a large array of field trips to various parts of the Wildlife Refuge that people normally wouldn't get to see.

Chuck Sexton [01:31:38] And my role in that, since I had close knowledge of the location and the populations of warblers and vireos on the Refuge, I would lead a tour that they called, "The Endangered Ones". They had some special name, but it's the specialized tour which focused not only on general birding but specifically targeted seeing a golden-cheeked warbler and a black-capped vireo for everybody and anybody, especially those birders who were coming to Austin to perhaps add those to their life list.

Chuck Sexton [01:32:19] And so my focus was trying to make sure everybody got a look at a golden-cheeked warbler and a black-capped vireo and to talk about the ecology of those birds when I had them out there in the habitat, and talk about the refuge and its mission. So that was a lot of fun to be able to spend quality time in a recreational sense with like-minded birders who were chasing those birds and wanted to see them close up.

Chuck Sexton [01:32:52] I must say, I helped out with the Songbird Festival for over 20 years. It's now, I think they managed to miss a year or two because of COVID, but this is now in about the 22nd year of the Songbird Festival in one form or another. And I led tours for about 20 years. And in all of those 20 years, I never failed to show people at least one golden-cheeked warbler and one black-capped vireo. Even though sometimes there was just a glimpse of a fleeting bird or two, I managed to allow them to tick it off their life list.

David Todd [01:33:33] That's great. I know that those life lists are some of the most valuable possessions that birders have, so ...

Chuck Sexton [01:33:44] Yes, indeed.

David Todd [01:33:44] Nice to have help with that.

David Todd [01:33:46] Well, so I had one last question, which isn't so much about your volunteer activities, but it's, it's really intriguing to me to see how you have, through your career, worked in every aspect of the sort of conservation world, whether it's working for a consultant, or working for a municipality, or working for a federal agency such as the U.S. Fish and Wildlife Service. And I was curious if you can sort of compare and contrast the roles that each of those plays in trying to protect and restore creatures?

Chuck Sexton [01:34:26] Well, the simplest conclusion I can come to is I certainly enjoyed being out in nature and getting paid to do it. I've had that benevolent career in which I've stumbled upon opportunities that allowed me to pursue my interests and get outdoors and have a productive job in that field, literally and figuratively.

Chuck Sexton [01:34:53] It, it did give me some perspective on the contrast between the private sector and working for the public. I must say, working for the private sector brings its own baggage that I was never 100% comfortable with. So I would never have made a businessman, a successful businessman on my own. But I enjoyed working in the field, in the private sector.

Chuck Sexton [01:35:20] Working for the City of Austin was very focused and that was an intense and very enjoyable part of my career. And we did some productive work on the

Balcones Plan. The City of Austin was a great place to work: great people to work with. And because it was local, I got that intense, detailed knowledge of both our habitats and the people involved with trying to protect those. And that was also a great joy.

Chuck Sexton [01:35:53] Transitioning in the mid-90s to the federal government was very beneficial to me as well, because it allowed me to really get back to being a field biologist. I had become a report writer at the City of Austin as we tried to finalize the Balcones Plan, and getting back in the field as a field biologist at the Refuge was certainly back to basics for me, and I enjoyed that aspect of being the wildlife biologist at a National Wildlife Refuge. You can't hardly design a more enjoyable career for a field biologist than a position such as that.

Chuck Sexton [01:36:39] But of course it was working for the federal government, and that brings its own baggage. And so it was a truism that for every good day I spent in the field at the Refuge, I had a couple of days of paperwork and reports to write, and no one can be happy sitting at a desk when you've got a multiple thousand-acre refuge you'd rather be out hiking around.

Chuck Sexton [01:37:07] So I had the best of all worlds in those stints that I did in the private sector, the public sector, locally, and then working at a National Wildlife Refuge to confirm that I love being out in the field and I managed in that career to put up with the paperwork. I wouldn't quiz my bosses on whether or not I did my paperwork successfully or on time every time. But I'll leave that to them and to history to judge.

David Todd [01:37:43] You've been very kind to spend all this time indoors, and I imagine you'd rather be out in the field.

David Todd [01:37:51] Well, let me let me ask you just one more question, very open-ended. But you've covered so much about your role as a biologist and questions about habitat and, and, of course, the golden-cheeked warbler. Is there anything that you might like to add that we just haven't covered well, we didn't give full coverage to?

Chuck Sexton [01:38:18] Well, I'd have to say that n my retirement now, I have that luxury of looking back over the, the change in attitudes through time. And, and not only that, but the change in focus. And I'm happy to see that for all the Warbler Wars we went through, one of the outcomes, not only with protected land for the golden-cheeked warbler, but with the training and the increased technical knowledge and professionalism of a whole new generation of field biologists that are focused on these issues here in Texas. There weren't many of us who were warbler experts back in the day in the seventies or early eighties, but that quickly changed. And now there are a great number of folks who can claim to be experts, and rightfully so, on the golden-cheeked warbler. And I guess the, the state of the golden-cheeked warbler, the status of the bird, and the management of all of the efforts that we have put in to protect that species, are in good hands with this new generation of biologists who have come on board and dedicated their careers to these efforts.

David Todd [01:39:49] It's a good legacy. You have some, some heirs to pass on all this good work you've done. And you're so nice to share your stories about these efforts with us today. Thank you so much for that, and for your patience with our sort of clunky recording systems, but it's much appreciated.

Chuck Sexton [01:40:19] Well, David, thank you for inviting me to this interview. It's been fun to recap a long career. I hope you find some of this information of use and good luck.

David Todd [01:40:31] You bet. Well, it's been really interesting and very valuable. Thank you so much.

Chuck Sexton [01:40:37] Thanks a lot.

David Todd [01:40:38] All right. You take care.

Chuck Sexton [01:40:39] Bye, bye.

David Todd [01:40:40] All right. Bye now.