

TRANSCRIPT

INTERVIEWEE: Russell Graves

INTERVIEWER: David Todd

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Russell Graves [00:00:01] You know, you see killdeer most in suburban areas in gravel parking lots where the ground is open and they can kind of skitter around and look for food. Well, they do the same thing in prairie dog towns. So you take the prairie dog town out of the mix because it is a keystone species and it starts to collapse the, the ecosystems of all those other species as well around them. And so I think for anything, that's why they're the most, that's why they're so important of a species in, in Texas.

David Todd [00:00:28] So, so it sounds like the prairie dogs, I guess, provide two things: I mean, one, burrows that give these other animals some shelter. I mean, I guess like a burrowing owl, but then also, maybe some, some food, I mean, prey for the black-footed ferret.

Russell Graves [00:00:50] Yeah.

David Todd [00:00:51] And then you were talking earlier about the mountain plover. How would a prairie dog benefit a plover?

Russell Graves [00:00:59] Just providing those, those open areas, you know, because a plover, you think of a plover as like a killdeer, as kind of a, a, sort of a, you know, a wetlands bird or a coastal bird. But those things, you know, when they're, when they're migrating back and forth, they need those habitats to kind of, you know, obviously not the water there, but just a similar type of habitat to be able to forage for food. So it needs to be open. It can't be the short grass or the tall grass like they're used to.

Russell Graves [00:01:28] You know, one of the things that, that we used to do when I was teaching, and look, and I'll be, I'll be crystal, crystal clear about this. It's not like that me and these kids were trying to defend a doctoral thesis, we're just using simple observational methods, you know, simple scientific methods, just to, just to record our findings on this 10-acre prairie dog town. But for like ten years, I would take kids out every spring and we'd do a few, on the same prairie dog town for 10 years, we'd do the same basic observations every single year and we did this, did it the same way. And we would, we would measure the town using GPS. We would just do an outline of the town when we'd first go out there. And that way over time, we could see, and if we even, if we were to animate it, it would have been cool. You could see how the town would ebb and flow in terms of its size and shape. It wasn't a static entity - the town wasn't. You know, in good years when you'd have more prairie dogs, the town would get a little bigger and the boundaries would change. When in lean years, it might get a little smaller and the boundary would change. So it was fascinating to look at that.

Russell Graves [00:02:35] We also did our best guess and would mark with GPS the active versus inactive burrows within that town, and, and just again, to show that how dynamic the town is from a, I mean, the town itself is living and breathing.

Russell Graves [00:02:52] And, you know, we'd do other things like we'd measure the soil infiltration rate. In other words, we would measure how, we, you know, we had the question, "Do prairie dogs affect how fast water infiltrates back into the soil when it rains?" And so we'd test infiltration rates both in the town and outside the town on like soil types, where the prairie dogs hadn't colonized yet, and see if there was a difference.

Russell Graves [00:03:18] We would test the forage quality and quantity in the town versus outside the town, on, on, on identical soil types, and that was a key part just to keep consistency in our observations, and to see if there was any difference in soil quantity and quality that the prairie dogs influenced, you know, again, in the town as opposed to outside the town.

Russell Graves [00:03:41] We would take observational, or we do observations and record the number, the kind of animals we saw in the town when we visited. We were doing at the time, we had a, I'm going blank on the name, but anyway we had a reference point, a T-post in the ground, and we would take a reference picture of the prairie dog town every single year when we were out there.

Russell Graves [00:04:06] So we'd spend about two months a year with this one class I taught, going out every single day, weather permitting, and taking these observations on these prairie dog towns, and then just trying to understand more about them.

Russell Graves [00:04:18] And one thing we did for several years, it was kind of cool is I got a grant, I actually got a couple of, I got several grants, but a couple of noteworthy ones. One grant provided us with a, with a fiber optic probe that we could put down in the holes and look at the prairie dogs in the burrows. And that was just, that wasn't, that was cool, not from a scientific standpoint, but just from a practical standpoint that you could take people out there and say, "Let's go look at prairie dogs in the holes!" It was kind of neat like that.

Russell Graves [00:04:46] But you know, we got a grant to, to buy some GPS collars. And because the ultimate question we tried to figure out is, because through all the, through all the data that we would collect, we started figuring out that inside the prairie dog town, they did indeed, in fact affect the, the, the plant quantity. So in other words, the pounds of forage per acre was less inside the prairie dog town that we found, as opposed to like soil types outside the prairie dog towns. But, and here's, this is the big "but": if you look at, if you look at numbers like crude protein and total digestible nutrients and all those things that cattlemen really focus in on when they're trying to determine the best rations to feed their cattle, the forage inside the prairie dog towns was far superior than the forage outside of the prairie dog town.

Russell Graves [00:05:38] So it came down to nutrient density and caloric density. You know, we can get full by eating ice cream all day, but a well-balanced meal that includes maybe some protein and salads is a lot better for us. And so, just from a, you know, not a scientific standpoint, but from a practical standpoint, we figured out that inside the prairie dog town, yeah, they didn't get as much food to eat, but it was better food for them, and the cattle probably did better.

Russell Graves [00:06:05] And then using those GPS collars that we put on cattle, we could turn cattle loose on these ranges for 90 days at a time. And when we took the collars off, it would give us a latitude and longitude location, as well as was their head up, or was their head down. And so we could determine all over these ranches where these cattle moved around because it would take a, would take a position for each cattle, each cow that we had a collar on every 10 minutes. And we were able to, over time, over a 90-day block of time (and we did 90 days because the batteries on the collars would run out), we'd gather the cattle up with the assistance of the local rancher who would help us out, we'd gather the cattle up, take the collars off, and then we didn't have the equipment to do it, but with the assistance of the Texas Cooperative Extension Service out of Vernon, we'd send them their collars because they had the expensive piece of equipment that was the, that was the interface that would allow you to download this data. And so we'd send that, those collars to them and they would download the data in an Excel spreadsheet and we could put it, use Excel to start being able to graphically analyze the data.

Russell Graves [00:07:08] What we figured out with all those data points was the livestock that we collared and we're, you know, I feel comfortable in making, in extrapolating to say all livestock, but the livestock we collared didn't shy away from the prairie dog towns. And so that told us that, you know, they weren't worried about their safety and getting their legs broken. But it also didn't, they didn't spend any more time in the town than they did outside the town. So what it told us is, is it was just another piece of ground for them. They were going to graze it when they were nearby, but they weren't going to spend any, you know, they were going to spend any extra time in it. But they weren't avoiding it at all costs anyway.

Russell Graves [00:07:49] So, and that was really a light bulb moment for me because all of sudden you start telling this story and you start showing people and even the rancher who is intimately knowledgeable about his land. He would say, "I don't think, I don't think cows go out in the prairie dog town. I think they avoid it." And once we were able to show him with the data, it surprised him. So then, you know, at least in the circles I'm in, it started bringing up a whole new conversation of, "Are they as bad as what we thought we thought they were?" And the question is, I just I don't think they were.

Russell Graves [00:08:19] Because if you look from a historical standpoint, I mentioned this before with how it supported the bison and the grazing ecology of the plains and the prairie dogs were out there. I don't, I don't think that it, it really necessarily in towns, on ranches where prairie dog towns were found, I don't think it really hurt the ranch, and I don't necessarily think it helped it either. It was just part of the ecosystem.

Russell Graves [00:08:42] And when you start, I found when I started talking to people in that regard, it started making sense to a lot of people who had prairie dog towns on their place that, you know, maybe there's a different way of looking at this situation then we just got to get rid of prairie dogs.

David Todd [00:09:00] You know, it sounds like you and your students were really serious, long-term, patient observers of these prairie dog towns.

David Todd [00:09:12] I was hoping that you might be able to tell us about other folks who've looked at them over the years. I think, of course, the Native Americans were probably students of prairie dogs. What, what do you think they saw? Or maybe some of the early Western explorers like Captain Marcy and Captain Lewis or naturalists like Vernon Bailey? Do you recall what, what their impressions were of these, these funny little rodents.

Russell Graves [00:09:44] You know, from, from what I researched when I wrote the book. It was the Spaniard, Cabeza de Vaca, who first came across the prairie dogs as he wandered around looking for the, just exploring the, the continent. And then it was, it was during the Lewis and Clark expedition is when it finally got its name, when they first, or when they first called it a barking squirrel that they found and, you know, made a scientific record of it. And then its first name was, and my French pronunciation is terrible, but "petit chien", which means "little dog". And so, you know, in those early days of the 18, the early 1800s is when, you know, it first got scientific attention.

Russell Graves [00:10:40] And as far as your question about the, the, the way that the natives kind of, kind of revered it, I didn't really look at that, that close, and I didn't really study it all that much. Not that it wasn't important, but you know, a lot of those cultures was just, was just, it was a spoken culture. There was not much literature to read. But, you know, I know that just, again, from a practical and common-sense standpoint, when you're a nomadic tribe like the Comanches or the Kiowas, or the Cheyennes or any of those tribes that lived out there, the prairie dogs were important to them for one specific reason. It may not be mythical reasons or mystical reasons. But there's a source of food in a place where food was sometimes hard to find. And so being a rodent, you know, I'm told, I've never eaten a prairie dog, but I'm told it tastes like squirrels. I've eaten squirrels before, just because it's the, the culture where I grew up was squirrel hunting was a big part of the culture.

Russell Graves [00:11:35] And so, you know, really, I think from what I can tell, early on, once that, you know, it was first discovered and entered in scientific record in the early 1800s. You know, it got its, in the early 1800s, it got its scientific name established. It was actually, it's actually named after Lewis of the, you know, of, of Lewis, Meriwether Lewis in honor of him, since he's the one that first brought it.

Russell Graves [00:12:02] But over time, you know, it was kind of not really thought much about until the West started being settled. And it was, it was the early 20th century, you know, 1904, 1905 was when the federal government got involved as the plains were being settled and being settled in earnest. And that's when the war on the prairie dog really began - state-sponsored kind of war on prairie dogs.

David Todd [00:12:29] Well, and that's something that I'd really like to learn more about. It sounds like they, these prairie dogs covered literally millions of acres, and had maybe hundreds of millions of individuals. And yet, I think by 1998, National Wildlife Federation recognized they were in serious decline and even petitioned for threatened status under the Endangered Species Act and that's, that is a long fall, a big decline. And I was curious if you could help us understand what the source of the change was in their population and their range?

Russell Graves [00:13:13] Yeah. So, at the time, the way I understand it, is that the prairie dog, the black-tailed prairie dog (there's five species of prairie dogs, so the one we're talking about what we see in Texas is the black-tailed prairie dog), and at the time, the black-tailed prairie dog range had been reduced by 98 percent, so there's two percent of the original range left in the wild. And so a lot of conservation groups, the National Wildlife Federation in particular, and like you said, this was in 1998, they, they petitioned the U.S. Fish and Wildlife Service to list the black-tailed prairie dog is a threatened species under the Endangered Species, under the auspices of the Endangered Species Act.

Russell Graves [00:13:54] And when doing that, you know, the whole thought was it would, it would usher in a level of protection to just really stop the wholesale destruction of the species. And you know, again, based on the facts we talked about earlier, it's a keystone species. And those keystone species are, it's not only important to save them, but all the animals that are associated with them. When you affect, again, when you affect the prairie dogs, you affect all the other animals that live with it.

Russell Graves [00:14:19] So the, the National Fish Wildlife Service petition to be listed, that's about the time I started working on the book. And so, as best I can remember at the time, what the U.S. Fish and Wildlife Service determined was it's, it's warranted to be listed. In other words, they thought it deserved to be listed, but they precluded it from listing because they wanted the states to figure out themselves, the states were black-tailed prairie dogs were found, they wanted the states to figure out themselves how to conserve the species without attaching this wholesale blanket threatened species status on the species.

Russell Graves [00:14:59] And so from there, you know, the ones I worked with the closest at the time, I say closest, not, I didn't work, I wasn't part of the group, but just understanding what they were doing was, was like the Texas Parks and Wildlife Department. They put together a working group and just brought in stakeholders and with interests from farming and ranching groups, to, from farming and ranching groups to wildlife biologist to conservation groups, and everybody else, just brought them to the table and said, you know, "Hey, we got to figure this out or the feds are going to do it for us."

Russell Graves [00:15:38] And I'm always a proponent of local solutions. You know, I think, I think those people out in West Texas who own big parcels of land know more about what's best for their land, as opposed to what a blanket federal, over-arching, a blanket, federal heavy-handed federal bureaucracy can tell them what to do. And so they just put everybody on the same page and said, you know, we just got to stop the decline of this animal.

Russell Graves [00:16:07] And part of that stopping the decline was, you know, we've got to start thinking differently about what we think about these and really start looking back at the federal government's approach to it from the time they declared war on the prairie dog to today, and how we can look at this species in a different light and not feel like that, if you have prairie dogs, you've got to wipe them out.

Russell Graves [00:16:31] And so I think in large part, that's what they did, because it is not, I mean, it's not listed as a threatened species. There's only two species of prairie dog, which is the Utah and the Mexican prairie dog that are listed as a threatened or endangered species. But the black-tailed prairie dog is not. And I think, not, I mean, not only, you know, I tell people this a lot, and I think in a lot of ways we're kind of living in the good old days of wildlife conservation in Texas, because the ethics of the landowners change to the degree I think that people see value now more in wildlife species than they ever had before.

Russell Graves [00:17:07] So at the time, and I don't want to name them by name, but all of a sudden you hear ranchers who kind of like, "I'd like to have prairie dogs on my place." And so there was a group out of Lubbock that was that was eager and willing to volunteer their time and efforts to take prairie dogs from people who didn't want them and relocate them to places where people did want them. And I think, for the most part, I haven't really kept up with their efforts lately, but back when that was going on, it looked like good days ahead for prairie dog towns.

Russell Graves [00:17:38] And look, I'll be the first to say it's impractical to think you'll ever rebuild 98 percent of the prairie dog populations, you know, and put them all back where they used to be. I think that's impractical to think because there is some inherent conflicts between the, the agribusiness infrastructure of our state and of our country and the, and the energy-producing infrastructure of our state and country, all things that we all need every day. I think there are some inherent conflicts, but I feel good to say that I don't think people are as uptight about prairie dogs as they once were. And I think a lot of that is just the work from folks like Texas Parks and Wildlife and others who are out there kind of fighting the front-line fight to, to just letting people know there is value in prairie dogs.

Russell Graves [00:18:24] There's, there's a, there's an ecological value, clearly. And there's somewhat of an economic value to, you know, from, from just a wildlife-viewing standpoint. And you know, you can't measure these things, but there's always an intrinsic value to having wildlife on your property. Just because I know me when I bought my little farm in Northeast Texas, one of the first things I started doing was converting it away from a hay farm that wasn't its highest and best use, and really looking at reestablishing it for a wildlife species. Because there's a, there's a latent and inherent quality. It improves my quality of life when I could walk outside and see 120 different species of birds on my own property, or, or, or, you know, 30 different species of different mammals, from the littlest mammals to the biggest mammals that live here. And I think people, there's just a little bit changing of an ethic I think when it comes to prairie dogs. And people, I think a lot more people, appreciate them than they once did.

David Todd [00:19:21] Yeah. Well, it seems like there's been a real evolution in how people view prairie dogs, and I think you, you touched on this earlier that, that maybe in the early days there was kind of a concern that, you know, livestock, cows, horses might break a leg or that they, they might be in competition with prairie dogs for grazing. Was there anything else that ranchers or maybe farmers, I understand that some farmers, you know, objected to the damage to irrigation canals and so on.

Russell Graves [00:20:04] You know, the farmer thing, the farming things a little trickier than the livestock thing. When I was working on the book and I remember, you know, one of the things that people seemed to, and this is anecdotal, but one of the things that people seemed to report to me the most that they didn't like about prairie dogs was the fact that cattle or horses could break their legs. But the thing is is when I when I'd ask about it, "Well, does it ever happen to you in your place?" They'd always say, "Oh, no, it's never happened to me, but I heard someone down the road it happened to." Well, I could never find that someone it happened to. And I'm not saying that anyone who was blatantly lying to me about it. I just think it's a big misunderstanding. If you, if you've heard the sky is purple your whole life, you'll always believe the sky is purple, even though we know it's not. And I think that it was, it was that simple. I think just people had heard the stories all the time and had been conditioned.

Russell Graves [00:20:53] And again, it's this and I don't mean this at all as a political statement, but it's the same, it's the same federal government who said, "We got to get rid of all the prairie dogs." A hundred years later was saying, "You know, we're going, we might limit your ability to make a living on your property and, and by listing this species as threatened." And so you take, you kind of take, and it's no wonder people have mixed messages about it, because people just never looked at them from a, you know, I mentioned earlier that, that one of the things I learned to do early on was, was look at a problem in a different light. And I'm

not saying I'm the only one who ever looked at this way. But you know, my whole thought was maybe the prairie dogs aren't as bad as what everyone says they are.

Russell Graves [00:21:39] And turns out they're not. I think people are accepting, a lot more accepting, of that than they used to be. And what I'm, to clarify on the, on the, on the thought that I had and, like, I don't know, 1901, I think it was, the U.S. Department of Agriculture's, U.S. Department of Agriculture come out with a year book of agriculture. And that year they estimated the prairie dogs, something like 63, occupied something like 63 million acres of land, in, in the United States. And, and a few years later, in 1905, a guy named Vernon Bailey, who was the chief of the, chief naturalist for the, for the U.S. Biological Survey, said that he'd found a prairie dog town that stretch from the Concho River in San Angelo all the way to Clarendon, Texas. And so that's, you know, it's the 250-mile long prairie dog town I was talking about.

Russell Graves [00:22:44] And, but at the time they were quoting that prairie dogs reduced the productivity, in the same, during this early 20th century, the federal government was reporting that prairie dogs reduced the productivity of rangelands from 50 to 75 percent. And, you know, so that kind of simmered. And then, by the 1930s, the federal government started sponsoring ranchers to poison prairie dog towns and try to just eliminate them from the plains. And that's, it's kind of during the 1930s. And you know, that happens to coincide with the greatest man-made ecological disaster our country's ever seen. And that's the Dust Bowl because of improper farming practices.

Russell Graves [00:23:28] So you've got this double whammy of poor farming practices and you know, that were, that were government-sponsored and government-supported. And then you've got these, this ecological disaster from a wildlife standpoint that we're going to go put out poison and poison out these prairie dog towns in this ecosystem. I mean, that's, it's during, during probably, my dates may be off a little bit, but probably from the '30s until the '60s, when the prairie dog, the numbers really, really collapsed in the country.

Russell Graves [00:24:02] And again, it's, it's, it's a little bit, if you look at the story and try to keep politics out of it, it's a little bit, a little bit alarming, and a little bit, a little bit eye-opening and whatever adjective you want to use, to realize that the same government who, who promoted getting rid of these species was the same government who also said, "Nope, you're going to have to preclude the economic activities on your own land to protect this one species that oh yeah, by the way, we told everybody to kill 70 years before."

David Todd [00:24:36] That's that's a really interesting point. I mean, it's, it's I'm sure some of the folks were feeling whipsawed. And in one case, said, you know, that these prairie dogs were bad and the next, you know, generation they're told that, "No, they're good!"

Russell Graves [00:24:52] Yeah.

David Todd [00:24:53] It must have been confusing.

Russell Graves [00:24:56] Like I was saying earlier, that I think if, if, if you're always told the sky is purple from the day you're born, the sky is always going to be purple to you. You don't know any better, because you haven't really been exposed to a different way of thinking. And I say that not trying to be demeaning to any, any, any farmer, rancher and I know a lot of those guys and I think the world of them and they're some of the smartest and most resilient and toughest people I know.

Russell Graves [00:25:21] But at the same time, if you're, you know, most people don't have the time to go and investigate every little thing that you hear throughout life, you just kind of think, "Well, it's what I heard, so it must be true." And I think that, you know, because they were being told by government officials from the '30s told, you know, grandpa or dad one thing, and then they inherited the farm and ranch and they just kind of kept the same attitudes. And it's, it's no wonder why all those years later, people are confused by it. And I think that's true with the prairie dogs. And, you know, unfortunately, a lot of other things as well.

David Todd [00:25:59] That seems like a really good point, I mean, as you say, a lot of times you just don't have the time to investigate on your own and you have to take people's advice or their version of the facts as, as the proof.

Russell Graves [00:26:16] I'll say this and I will stand on this. I think from a contemporary standpoint, I think, I'm going to give grace to all sides involved when it comes to species like prairie dogs or anything else. I think for the most part, people have the, they have self-centered intentions, but I always think the best intentions. I think it's rare that people don't have the best intentions, especially when it comes to a lot of rural people who are just trying to get by. You know what I mean? They're just trying to, they've got a farm or ranch they're trying to keep together. They're just, they're doing what they, what they can to get by.

Russell Graves [00:26:51] And, you know, it sometimes it relies on people like me and people like you and others who are in, you know, I'm not a professional conservationist, I'm an armchair conservationist, but to just tell a different story and, and not be preachy about it, not be browbeating about it, but just say, "Hey, have you thought about it this way?". Because, I think, if, if I was to press a lot of people that have prairie dogs on their property, I think a lot of them kind of like them, which goes back to that Steve Bird I mentioned earlier. He never did anything about the prairie dogs on his land because he kind of liked them out there. And I think a lot of people are that way.

David Todd [00:27:29] Mm-Hmm. And from what little I know, it sounds like some of the prairie dog's decline is, is not really directly related to people and the extermination campaign, but, but this onslaught of plague. Can you tell us a little bit about the bubonic plague and its effect on, on prairie dogs?

Russell Graves [00:27:55] Yeah, it is pretty devastating to prairie dog towns. They're, you know, it's the same bubonic plague, and I think that's probably what gives them a bad rap, but it's the same bubonic plague that affects people and it's spread by fleas. And I think, on the subject of bubonic plague, and I think that's probably another thing that sort of gives prairie dogs a bad rap is, you know, we hear all the horror stories about the plague that happened in the, in the, you know, the Middle Ages, in Europe, and how many people it killed. And you know, I guess it's, it's in a lot of ways parallels the pandemic, like we're, we're all living with now. And so it's, I think people fear prairie dog towns for that. But, but the plague, and I'm no, and this is a little bit out of my, you know, when you start doing viral or bacterial diseases and their modes and mechanisms by which they work, it's a little bit out of my expertise, but I just know that, that when a plague is introduced into a prairie dog town, it can be pretty devastating. In fact, it can wipe out an entire, especially small, towns.

Russell Graves [00:29:13] So when towns were bigger, you know, and that's where the real danger for prairie dogs now, when towns were bigger, you know, like this big 250-mile long

by 100-mile wide prairie dog town. If it was to affect part of the prairie dog town, it wouldn't necessarily affect the whole town, it would be pockets of it that would get it, and the disease would manifest itself. And this is where I don't know why, but you know, it would kill all the ones it was going to kill, then kind of go away for a while, and then it may pop up somewhere else and do something else. But now that you have these segmented populations of prairie dog towns, once it gets introduced into a town, it can be devastating towards just, just that one particular town that's in.

Russell Graves [00:29:53] I suspect that prairie dog town that we studied as a, in, that I studied with the high school kids when I was still teaching. It, a few years later, all, all the dogs disappeared on it. I suspect it was probably a plague that wiped them out.

Russell Graves [00:30:06] But had that been a bigger town in a more interconnected ecosystem, it might have affected that 10 acres. But you know that 10 acres would soon be re-colonized by other towns, other prairie dogs coming from the periphery. As, you know, prairie dogs live in a sort of society where, as the young males get older, they kind of get ran off by the older males, and they've got to go find a new town somewhere else. And it was funny when we were, when we were studying these prairie dog towns, just about every year we'd find a prairie dog town that was, that was across the draw, you know, half a mile away, where you'd go over there and you'd find two or three burrows where they're trying to establish a new town there, they're just trying to start a new town somewhere else.

Russell Graves [00:30:48] And, you know, so if a plague was to wipe out entire town, if that town was bigger than 10 acres, those, those burrows would get reused by subsequent populations of prairie dogs. The local dynamics of their population dynamics in the place.

David Todd [00:31:07] Huh, interesting. So the existing prairie dog town might get reoccupied. Another group might come in and transplant themselves there?

Russell Graves [00:31:19] As best I can tell, that's, that's what would happen there. Again...

David Todd [00:31:23] I see.

Russell Graves [00:31:24] Because every, every year just the dynamics, just because of, you know, limited resources in a particular given area. And you know, I can't, I may be wrong on this, but I can't think, I mean, I think essentially, every animal, every organism on the planet is born to do one thing and that's reproduce. And so as these towns naturally try to grow in size and in turn become more numbers, they're just, you know, the, the adult males push the young males out. Same thing happens in bison populations. Same thing happened in a lot of different animal populations that live kind of, not cooperatively, but they, they live commingly, they commingle with each other and live in sort of a loose social society, that, you know, the young males get kicked out to go kind of stake their claim somewhere else. And that's what happens amongst prairie dogs as well.

David Todd [00:32:23] Yeah. You know, we've been talking about the decline and how they, these prairie dogs have been vulnerable to both the extermination campaign and then also the plague. But I think it might help put this whole decline in, in context, if you could talk about some of those early estimates of the range and the population that people like Vernon Bailey and others created. I think J. Frank Dobie had some, some estimates, too. And, and I've heard that other people, more recently, in the last 10, 20 years, have said, "You know, those

estimates, they may have been high and the decline may not have been as dramatic as we feared." Where do you come down on that debate?

Russell Graves [00:33:23] You know, I think, I think they're probably right. You know? I look at it like this. With, with the advanced resources I have, if I was given the task to go out and measure the size of every pond in this, in the county where I live now, I'm probably going to get it wrong. And that's with all the advanced technologies that we have at our fingertips now. So if you look back from a historic standpoint, I'm sure there's a lot of guesstimation going on, people just kind of put their finger to the wind.

Russell Graves [00:34:00] And, you know, I can't, I can't imagine, just knowing the nature of people, and knowing how things work and just, you know, being at least somewhat a passing student of history, there was probably some, there's no doubt there was, and I can't prove this, it's just my hunch, but there's probably no doubt when they were doing those early estimations is, you know, there's probably a financial interest behind them saying this is the official record. And you know, whether that was money passed under the table, or whether or what it was or, you know, we're, people are people, and we have our own biases and sometimes people take those biases too far. And so it wouldn't surprise me if every one of those estimates are wrong and we're just dealing with flawed data.

Russell Graves [00:34:46] You know, it's on a different species that's kind of a western species that, that I did a story on a magazine with, it's not the black-tailed prairie dog, but the, the dune sagebrush lizard. I did a, I did some pictures and a story in a magazine about that, and how they threatened to, if those animals, if those lizards, were listed as a threatened species, how they might curtail oil production in one of the richest, if not the richest oil production area in the entire world. And that was kind of the Wolfcamp shale in the Permian Basin in East New Mexico.