

**TRANSCRIPT**

**INTERVIEWEE:** Cathy Downs

**INTERVIEWER:** David Todd

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**David Todd** [00:00:03] Well, good morning. David Todd here.

**David Todd** [00:00:06] I have the privilege of being on the line with Cathy Downs. And, with her permission, we plan on recording this interview for research and educational work on behalf of a non-profit group called the Conservation History Association of Texas, and for a book and a website for Texas A&M University Press, and finally for an archive at the Briscoe Center for American History, which is based at the University of Texas at Austin.

**David Todd** [00:00:37] And all that being said, we wanted to emphasize that she has all rights to use the recording as she sees fit.

**David Todd** [00:00:45] And I just wanted to make sure before we go any further that Ms Downs was all right with that.

**Cathy Downs** [00:00:51] That sounds great, David. Okay.

**David Todd** [00:00:54] Well, good.

**David Todd** [00:00:54] Well, let's get started.

**David Todd** [00:00:56] Let me say a few words about what we're doing here.

**David Todd** [00:00:59] It is Wednesday, May 17th, 2023. It's about 10:40 in the morning, Central Time.

**David Todd** [00:01:07] As I said, my name is David Todd. I'm representing the Conservation History Association of Texas, and I'm in Austin. And we are very fortunate to be conducting an audio interview with Cathy Downs. This is a remote recording. She is based in the Comfort, Texas area.

**David Todd** [00:01:28] Ms Downs has been a non-stop educator for many years about Texas conservation topics, especially those related to monarch butterflies and other pollinators. She's had a variety of roles in groups such as the Texas Master Naturalists, Texas Wildlife Association, the Cibolo Nature Center, and programs like the Monarch Larval Monitoring Project, the Monarch Joint Venture, and Monarch Watch, Bring Back the Monarchs to Texas program under the Native Plant Society, and doubtlessly other efforts as well. But, perhaps that gives a quick introduction to her, her varied and energetic work.

**David Todd** [00:02:12] So, today we will be talking about Ms Downs' life and career today, and especially focus on what she's learned and shared about the history of butterfly study and appreciation and conservation, particularly focusing on the monarch butterfly.

**David Todd** [00:02:30] So following that little introduction, I thought maybe you could start us off by please telling us about your childhood and early years, and if there might have been some people or events in your life that influenced your interest in nature and insects and particularly butterfly.

**Cathy Downs** [00:02:51] Okay, David, thanks. It's a pleasure to be here and I appreciate this opportunity to speak with you.

**Cathy Downs** [00:02:58] I can honestly say that my earliest memories in nature were particularly with my own parents. I was fortunate enough to have grown up in the country on a farm. I was living in Maine and my dad was very involved through the University of New Hampshire and Yale in forest management. And during his school years, he had to participate in a lot of projects related to forest management.

**Cathy Downs** [00:03:31] So, my earliest distinct memories involve a couple of those projects, which included a pine cone collection, leaf arrangement collections, identification of collections. We literally tore apart pine cones and had to list and identify several different pine tree species and that kind of thing. We did tree surveys with him. I planted seedlings. We were also planting willow trees. Roses were a specialty of his. We gardened.

**Cathy Downs** [00:04:06] My mom came into the picture there. She was particularly knowledgeable in berm and water use, partner planting, natural fertilizers, fruit tree pruning, the care of wildlife management, animal husbandry, pest management.

**Cathy Downs** [00:04:26] So, these things were all naturally occurring to me when I was young. So I grew up in the woods.

**Cathy Downs** [00:04:36] Our vacations were even nature-oriented. So, this all seemed very much a part of my life at that time. So my early years were distinctly nature-related. I took great joy in that. We all did. I was one of three children.

**Cathy Downs** [00:04:52] So, even when we were on vacation, it was nature-related. We were camping or hunting or hiking or fishing.

**Cathy Downs** [00:05:01] My dad was a great fly fisherman. So we were taught fish species. We were taught to fly and their larva use for tying flies. We were taught about the hatches on fresh water.

**Cathy Downs** [00:05:17] All of those things, combined, led me to a real curiosity about science, nature, ecosystems, the food web. All of those things became a huge part of my life going on.

**David Todd** [00:05:32] Isn't that nice. I mean, some folks like yourself have this this introduction, these mentors, that are some of the closest people in your life, and you get this really intimate tour, you know, through the natural world. So, gosh, very fortunate.

**David Todd** [00:05:53] So you talk a little bit about your family. I'm curious if, you know, as you got on to go to grade school, if there might have been any teachers there, or maybe classmates, that encouraged this kind of interest in the outdoors or might've taught you some things as well?

**Cathy Downs** [00:06:15] Well, it's kind of interesting that the nature conversation kind of stopped at school for me. In that day, and without relating to my actual age, as any normal woman would, I can tell you that in that day, those types of topics were not really acceptable topics for women to pursue. I mean, I can remember distinctly in high school having a chemistry teacher that was highly motivational and really wanted me to pursue a career in chemistry. And it was not really the way I wanted to go. I was much more interested in conservation, wildlife, insects and that kind of thing.

**Cathy Downs** [00:06:57] But they were very small part of science curriculum, mostly in the elementary education. And then in the secondary education, science was not something that was really encouraged in young women as a pursuit.

**Cathy Downs** [00:07:10] So it was essentially socially unacceptable. There were no career opportunities up until the early seventies, when there was much more public interest in conservation due to the Leopold documents. Aldo Leopold presented the presidential administration with documents that pointed to conservation issues that were happening at the time and the National Park, the National Park Services began and increased the interest in conservation.

**Cathy Downs** [00:07:47] And if you remember, in the seventies, that began a series of events which included outdoor communal living, raising animals and vegetables, and created the whole organic farming movement. And I was actually interested in a great deal of that and participated at some level in those ideas.

**Cathy Downs** [00:08:11] So, the education that I received, most of that, was during my summer vacations, again with my dad and my mother participating in the farm work, taking on some jobs, part-time, helping my dad cruise timber and that sort of thing. And then I was able to participate in some of the outdoor organic farms and so forth in my own neighborhood. So I essentially went to school to graduate high school and move on onto the things that really did interest me.

**David Todd** [00:08:51] You know, it sounds like the sort of formal classroom environment maybe wasn't the place that give interest for you. But, I'm curious if there were any sort of more informal ways to learn about the natural world, maybe books or films or TV shows, that were out in the culture that you might have absorbed?

**Cathy Downs** [00:09:16] Well, there absolutely were. I mean, that was where I got most of my information and where I was most happy, was in my books.

**Cathy Downs** [00:09:24] But one particular show that I remember that got me really excited and I don't know if you remember this one or not, was Wild Kingdom. It was Marlin Perkins and Jim Fowler, and they would go out and have these great adventures. And also, during these adventures, they were the first to raise awareness about the importance of protecting the environment.

**Cathy Downs** [00:09:47] And, I distinctly remember Jim Fowler, who went on to appear on Johnny Carson and other places where he would bring these crazy animals on. But, he was a person that really made a difference to me because his whole ideal was to make nature personal. In other words, what's in nature for me? And it was the quality of human life, how

making nature personal, making conservation a part of your life would give you greater quality in your human life.

**Cathy Downs** [00:10:20] And that made a big impact on me, going forward, that I knew, with my mom and dad, and the way that they raised us, and seeing how successful the farm was, and how successful we were at managing the animals on the farm, and the wildlife there, that the quality of my childhood brought me great joy.

**Cathy Downs** [00:10:44] I wanted to do that for others going forward. That's what was in it for me, that we could conserve wildlife, we could bring quality to human life, we could make nature personal. So that impact was huge for me.

**Cathy Downs** [00:10:58] My dad introduced me to Aldo Leopold, who he essentially called the father of conservation ethics. So Aldo Leopold's land ethic essentially calls for an ethical, caring relationship between people and nature.

**Cathy Downs** [00:11:12] So I don't know if you're seeing a pattern here, but these are the things that I began to get really interested in.

**Cathy Downs** [00:11:20] Jane Goodall was a huge icon for me. She had no college degree when she began her search for quality in her human life, but she learned about deforestation when she began working with chimpanzees, and she became an activist in support of wildlife conservation.

**Cathy Downs** [00:11:43] Or you may remember Jack London - high adventure travel and nature. And he was such a charismatic person with such a short life. But that got me thinking, too, that travel was going to be part of my adult life, and I was going to go to exotic places and learn more about the plants and the animals in other parts of the world.

**Cathy Downs** [00:12:09] I spent a lot of time with the journals of Lewis and Clark. I read them about every three years to this day - the idea of the undiscovered wilderness, which there's still a lot of that in Maine and Alaska, where they would find new botanical and animal species. I still dream the day when, oh, I don't know, botanical species, "Cathii", that might come up someday and how exciting that would be.

**Cathy Downs** [00:12:36] And their footprint on the environment was really, really small. So for an expedition of that kind, and the excitement that came with meeting new species, not just of plants and animals, but of humans, interacting with Native Americans for the first time.

**Cathy Downs** [00:12:56] And then my dad, I remember, gave me a volume of national parks in the late sixties, and I remember making plans on which of those parks I wanted to visit when I grew up, even though they had already been discovered. I was looking forward to discovering them for myself when I grew up.

**Cathy Downs** [00:13:12] So, all of these things had a pattern that I didn't see at the time, but I certainly see now. And going back and thinking about who my mentors were, and what kind of books I would read, and not seeing then where this might lead me. But, looking back on it now, thinking about talking with you, they certainly made a huge impact on what I did with my life the last 20 years.

**David Todd** [00:13:41] That's interesting. It seems like sometimes things are easier to see and understand in retrospective kind of thinking. Yeah.

**David Todd** [00:13:53] So, tell us a little bit about how you might have been introduced to monarch butterflies. What was your sort of entry point to this big period in your life where you really seemed to have invested so much in that creature?

**Cathy Downs** [00:14:11] Well, it's interesting because monarch butterflies really have always been a part of my landscape. I mean, I knew what they were when I lived on the farm in Maine, and I could identify them in all their stages.

**Cathy Downs** [00:14:25] But, I wasn't really aware of the entire picture until I moved to California. I lived in Santa Cruz, California, for a number of years, and I lived about one mile from the Santa Cruz Natural Bridges State Park. And there was an overwintering area of butterflies there that lived in the eucalyptus grove. And, at the time, there were close to, oh, 30, anywhere from 20 to 30, million butterflies in the overwintering area there.

**Cathy Downs** [00:15:01] And I discovered it by just hiking. There was a railroad track behind my house and walking along the railroad track, I went into the park. And it was during the winter months, and I moved into the park through the eucalyptus trees. And, at that point, I did not know that monarchs overwintered in California.

**Cathy Downs** [00:15:21] So, that was a huge event for me to think that monarchs had two separate populations, not just the eastern population that I knew, but also an entirely separate population. And so, I think that I probably questioned that poor docent to distraction at that point, and went back several times to learn everything I could about this population.

**Cathy Downs** [00:15:49] It's sad that now that population has been reduced dramatically to the point where I think they only had about a thousand butterflies left there last year. And that is a separate population from the eastern population altogether. And they are working and making great progress out there.

**Cathy Downs** [00:16:08] So, that was my first introduction to the entire biological system, the annual migration, if you will, for the monarch butterflies.

**Cathy Downs** [00:16:21] But, when I moved to Texas from California, and then I joined the Texas Master Naturalist program, I went to work in a small garden as volunteer project in Kerrville. And I had noticed the relationship between butterflies and their host plants, specifically the milkweed to the monarch. I had a lot of questions about this relationship, and I studied it pretty hard in that garden. And a real eye-opener for me was getting stinging nettle into my ankle and noticing caterpillars on the stinging nettle that turned out to be the red admiral's butterfly caterpillar.

**Cathy Downs** [00:17:07] So, something as toxic, if you will, as a stinging nettle was actually a host plant to the most, one of the most, beautiful butterflies. And I thought that I really have to start to investigate this more. And it led me to starting many other houseplants at the garden and also at home.

**Cathy Downs** [00:17:29] So, I wasn't the only one that wasn't aware of this relationship between butterflies and houseplants. And I began sort of a campaign of education on Hill Country butterflies in their host plants.

**Cathy Downs** [00:17:47] The garden actually had a monarch larval monitoring project site. And I definitely needed more info on that. So, that's when I was introduced to Dr. Kip Kiphart, who became one of my best friends and mentors. He was, at the time a Monarch Larva Monitoring training educator. And I took his training course.

**Cathy Downs** [00:18:14] Well, I ended up going on with Dr. Kiphart and invited him to present at the garden for the rest of my volunteers there. It went really well, and there it brought up quite a bit of motivation to the volunteers there, and we began to literally search out new host plants. It was a completely native garden. So, we started out by looking, looking completely for native host plants, and we got quite a large assortment of these in there, and we were quite proud of it.

**Cathy Downs** [00:18:55] So, I started assisting. Dr. Kiphart asked me to assist him in some of his workshops. So, I started assisting him in these workshops in 2010, and then I certified as a Monarch Larval monitoring trainer in 2013. And so, essentially, that was where I really began educating in the monarch butterfly world was through Dr. Kiphart's workshops, and I still stayed on as the project director at the Garden, essentially stayed in the Hill Country butterfly and host plant presentation arena as well.

**Cathy Downs** [00:19:41] So, I was kind of working three different - that was my first multitasking issue, if you will, was between 2010 and 2013.

**David Todd** [00:19:52] I see. Well, that's great. I wonder, you know, how many ways there is to learn about monarchs, you know, whether it was that early exposure in Maine to the visits in Santa Cruz and then later in Kerrville. So, great that there's so many doors to this wonderful creature.

**David Todd** [00:20:17] Well, and as we talked about that insect, could you maybe help us with just sort of a very lay person introduction to the life history and ecological niche, maybe the cultural place, of the monarch butterfly?

**Cathy Downs** [00:20:33] Oh, sure. Well, it's actually one of my favorite things to talk about.

**Cathy Downs** [00:20:38] Well, I'll start with the scientific life history, which is actually recently been updated with some new research out of the Florida Museum of Natural History. I'm really excited about this. So, we did know already that not just monarch butterflies, but all butterflies, had evolved somewhere between 30, we believed that monarchs and other butterflies, had evolved somewhere between 30 and 50 million years ago, along with flowering plants.

**Cathy Downs** [00:21:16] The new research shows us from Dr. Akito Kawahara, from the Florida Museum of Natural History, after about ten years of research, that butterflies likely originated in North America and Central America. So, this was kind of a surprise to begin with, and that they evolved from moths, if you will, as some of the moths split from night-flying feeding to day-flying feeding, when flowering plants became more colorful, with the advent of pollinators like bees. And the flowers began taking on more distinctive colors as these millennial bees started to appear, and that was about 100 million years ago.

**Cathy Downs** [00:22:04] And so, these moth species that split from the night-flying moths started feeding on legumes, or bean-type plants, if you will. And then flowering plants became

more colorful when these pollinators started working on them. And that's how their distinctive color began to appear on the butterflies. And that was about 100 million years ago.

**Cathy Downs** [00:22:30] And the butterflies were actually one of the species that survived one of the Earth's great extinctions. So I think that's kind of interesting.

**Cathy Downs** [00:22:41] The cultural history is also pretty amazing. When I started looking into this, I had already been aware, and as many people are aware, that particularly in Mexico, there's a great cultural affinity with the monarch butterflies. For instance, the Day of the Dead in Mexico, they build shrines for their ancestors with lots of monarch butterfly decoration because they believed that the monarchs are the souls of their returning ancestors.

**Cathy Downs** [00:23:18] Also in Mexico, in more ancient Mexico, the cultures associated the monarch arrival and fall with agricultural science. They were considered the "reapers". So when the monarch butterfly would show up in the fall migration, they knew that it was time to harvest. So, I thought that was kind of interesting.

**Cathy Downs** [00:23:42] In Mesoamerica, they were actually associated with militaristic expansion. They found pectoral and head ornaments on armor with butterfly decoration, and they would wear these ornaments to show that they were interested in militaristic expansion.

**Cathy Downs** [00:24:01] But, the thing that was really exciting was even in Egyptian hieroglyphs, they found monarch colored butterflies with, buried in tombs with quotes that said one of the pleasures that awaited the deceased on the journey to immortality were butterflies. And that was over 5000 years ago.

**Cathy Downs** [00:24:31] So, there's some great cultural history behind there as well.

**Cathy Downs** [00:24:35] For many years, we didn't even know where butterflies overwintered. And I think some of us can remember in 1975 when the overwintering areas were discovered for North America. So Dr. Urquhart had sent a couple of interns into Mexico, and in 1975, they located the oyamel colonies of monarchs.

**Cathy Downs** [00:25:01] And then, we were able to discover that they did indeed migrate in huge numbers to Mexico in the high altitude volcanic mountains down there.

**Cathy Downs** [00:25:14] So that's pretty much the North American history.

**Cathy Downs** [00:25:18] You know, so their ecological niche is also pretty interesting. They actually belong to two different niches because adults are not really part of the food web but the caterpillar is. So, they are pollinators or nectar-eating insects as adults. But as caterpillars, they are both prey and herbivores. So, they're feeding as caterpillars on milkweed, and they are prey to non-vertebrates. In other words, birds, vertebrates in general - they are toxic to them because of the cardenolides toxicity that's found in the milky latex of the milkweed plant.

**Cathy Downs** [00:26:04] And they can only use milkweed as host plant. They can't use any other host plant other than milkweed. Many insects can use multiple plants, up to two or three plants in the same family, or even several different families of plants to lay their eggs on.

**Cathy Downs** [00:26:24] But, the monarch specifically uses milkweed. If they lay their eggs on anything else, those eggs hatching will die. Those caterpillars will not survive.

**Cathy Downs** [00:26:35] So, basically the adult and the young belong to those two different niches.

**David Todd** [00:26:50] That is great. Gosh, such an involved story about their sort of life history and their cultural role, and then their ecological place.

**Cathy Downs** [00:27:01] They really are unique.

**David Todd** [00:27:04] Yeah, clearly. Well, tell us a little bit about this migration. I think you touched on it just briefly in Dr. Urquhart's discovery of their overwintering spot in the oyamel firs, but I gather that there are other phases in their migration. Maybe you can fill us in on that.

**Cathy Downs** [00:27:29] I think the most outstanding fact about immigration is that if you consider the summer monarchs populate the entire North American continent of over three and a half million square miles. During the fall migration, the entire mass makes a move to an overwintering area of only 4100 square miles and then returns in the spring with the distinct task of repopulating the entire continent. So we don't know of any other migration comes even close to that task.

**Cathy Downs** [00:28:06] So, that being said, this is how they go about it. So, we have, generally, four distinct flyways in Texas in the spring, and it's always difficult to say where do we start on migration? Do we start with the spring migration or the fall migration? Because it's actually an annual cycle of monarchs as opposed to a general 30-day cycle for most butterflies.

**Cathy Downs** [00:28:35] And in an annual migration, you're looking at four to five generations of monarch butterflies. So, if I start with a spring migration, meaning that all of our butterflies, all monarch butterflies that are alive, are eight to nine months old and they're living in the oyamel fir trees at 12,000 feet in the volcanic ranges in the state of Michoacan, in Mexico. When they are in those trees, and the winter's ending and the days are growing longer, the monarchs are becoming more active and they're even beginning to mate. They're looking for water. They're converting some of that to sugars and energy.

**Cathy Downs** [00:29:29] They're leaving those Mexican roots during about the first or second week of March. They're flying north and east and they're looking for milkweed plants specifically in which to lay their eggs.

**Cathy Downs** [00:29:40] So, those monarchs have already survived a long flight in the fall. They've survived the winter's cold. They've escaped two predatory bird species that have learned how to tolerate their toxicity. They've survived roadway hazards and other winter events, weather and they're the only monarchs left that can repopulate the North American continent. If they come back too early, the milkweed not going to be up and they come too late, they're not going to be able to lay the eggs and continue that cycle in time.

**Cathy Downs** [00:30:19] So, the migrating females are laying eggs on the milkweed plants they find as they time. They're also solo. They're not going in groups.



**Cathy Downs** [00:30:29] So, the spring migration is a shorter solo flight. They're older butterflies, they're laying eggs and they need milkweed. So, the first spring caterpillars that they lay their eggs on.

**Cathy Downs** [00:30:43] And these older butterflies are coming through Texas through our three flyways. One is going a little bit toward West Texas. One flyway is coming right up through central Texas, maybe following I-35. And one of the flyways is veering off toward the Gulf and doing a sort of coastal flyway.

**Cathy Downs** [00:31:03] So, they are laying their eggs, maybe getting up as far as sometimes as Oklahoma and Kansas, before they've laid as many as 500 eggs apiece. Once they've done that, they're finally going to die after their nine-month flight.

**Cathy Downs** [00:31:21] Those generations, those eggs that they've laid, become the first generation of new butterflies. And so, those butterflies are then going to continue north, laying a second generation of eggs. And after only 30 days, that generation is going to die. The new generation is going to continue north, laying another generation of eggs. That's third generation. The second generation dies.

**Cathy Downs** [00:31:50] And you've now reached maybe the northern borders of, you're into Minnesota, maybe the Great Lakes. You're even maybe moving up toward the southern border of Canada. They'll go as far north as milkweed survives, laying that last generation of eggs.

**Cathy Downs** [00:32:09] So, essentially, summer monarchs have a much briefer life than the overwintering generation. Their adult life span is only 3 to 5 weeks, compared with eight or nine months for the wintering adult.

**Cathy Downs** [00:32:21] So, there's 3 to 4 generations of those butterflies depending on the length of the milkweed growing season.

**Cathy Downs** [00:32:27] So, now they've repopulated the continent, and it's about July. It's an amazing feat, if you ask me. So before the summer ends, once again, millions of monarchs all over the U.S. and southern Canada.

**Cathy Downs** [00:32:44] So, in the late summer and early fall, monarchs emerge from their pupa. They're biologically and behaviorally different from those emerging in the summer. They are stronger. They have larger wingspans. Their thoracic muscles and their wings are stronger.

**Cathy Downs** [00:33:04] And they don't reproduce. They go into what's called diapause, meaning that they don't completely develop their reproductive systems. Their entire existence now is based on getting as fat as they can, drinking all the nectar they can possibly drink, putting as much fat into their abdomens as possible.

**Cathy Downs** [00:33:29] So, even though they look like summer adults, they aren't going to mate or lay eggs until the following spring.

**Cathy Downs** [00:33:37] So, instead, they're preparing for this incredibly strenuous flight. So, they're flying as many as 3000 miles. So, otherwise, being solitary, they're now going to cluster at night, moving south all the time. So you're going to start to see roosts of monarch butterflies, up to thousands, together over night. In trees, you can start to look for these roosts

along rivers, are very popular, large pine trees. They're going to roost together in those as they fly south.

**Cathy Downs** [00:34:12] They're going to catch thermals to try to conserve energy. They'll look for those warm thermals that will help them to fly faster. And they'll fly about 50, to anywhere from 50 to 150 miles a day. So, they're trying to get there as fast as they can because they're cold-blooded and they're unable to fly in cold weather.

**Cathy Downs** [00:34:34] So, the fat stored in those abdomens is kind of a critical element for their survival. It not only fuels their flight for 1 to 3000 miles, but that fat has to last them until next spring when they begin the flight back.

**Cathy Downs** [00:34:49] So, it's a tough job being a monarch.

**David Todd** [00:34:54] I loved your comment at the beginning where it's hard to know where to start, if you start in the fall or the spring, and that it's this endless cycle.

**Cathy Downs** [00:35:04] It really is an annual cycle. You can't even think of it as sort of a regular butterfly cycle. It's an annual cycle.

**David Todd** [00:35:14] Yeah, and sort of like a relay, it sounds like, from one generation to the next.

**Cathy Downs** [00:35:20] Absolutely. By August, mind that they have to literally repopulate the continent.

**David Todd** [00:35:24] So one thing that I didn't quite catch, I think you said that there were four different routes through Texas, and I think you mentioned West Texas, then the I-35 corridor and then the Gulf Coast. And was there a fourth?

**Cathy Downs** [00:35:43] There's one that kind of goes up, if you think of the Rio Grande - say, you're intersecting the Rio Grande in three parts and then one part. So if you intersected the Rio Grande into thirds and then followed the Gulf Coast for the fourth Flyway. So essentially the further west you go, it's going maybe through El Paso, and then one is going through, let's say, Brownsville. And then one is going around, I want to say, like right up I-35 basically. And then one is going distinctly along the coast, just literally hugging the coast.

**Cathy Downs** [00:36:32] So, you have, you have like a Western flyway. And then you have what I think of as the central flyway. And then you have sort of a north east flyway, and then you have a Gulf coastal flyway.

**David Todd** [00:36:52] Okay. All right. Okay. That helps a lot. Thank you very much for that.

**David Todd** [00:36:58] So, I think you mentioned that the California population had suffered some serious declines.

**Cathy Downs** [00:37:08] Yes.

**David Todd** [00:37:08] Maybe you can fill in this story about trends for the eastern population that we see here in Texas. What sort of changes and patterns have been seen over the last generation or so in Texas?

**Cathy Downs** [00:37:27] I almost have to go back to early nineties. When they first started really counting populations, so that was in, oh, about the early nineties, even as early as 1996. Let's say we start there with a billion butterflies, literally 1 billion butterflies. It was around 1 billion, the count.

**Cathy Downs** [00:37:54] So, they count in hectares, which are about two and a half acres. So they draw perimeters around a number of trees and they count out that hectare, and they evaluate or approximate how many butterflies are in that one hectare. And they count how many hectares of trees that they see the butterflies roosting in. And then they multiply that by the average number of butterflies roosting in their original count and they get an overall population.

**Cathy Downs** [00:38:27] So you can say that they count by, oh, like last year we had four hectares of butterflies.

**David Todd** [00:38:37] And this is down in the oyamel firs.

**Cathy Downs** [00:38:39] Yes. We count only in the oyamel overwintering area. So that's what we consider the sustainable population, is what we count each winter, in the overwintering area.

**Cathy Downs** [00:38:50] And that's done by the World Wildlife Federation, who contains a biosphere there. They call it a biosphere. It's a protected area, meaning they can't, or aren't supposed to, do any logging in that area. It's a protected area specifically for the overwintering of monarchs, the same area that they found in 1975.

**Cathy Downs** [00:39:14] So, if we say that in 1996 we had 1 billion butterflies physically counted, compared to 2014, we had 33 million butterflies. So that was a drop of 90% between 1996 and 2013. We lost 90% of our butterfly population.

**Cathy Downs** [00:39:41] So, there were many reasons that we saw that happening.

**Cathy Downs** [00:39:46] And so we have research in early years versus newer research, and we will look at that.

**Cathy Downs** [00:39:53] Earlier research, we saw Roundup Ready crops came in. So, we saw a distinct affiliation between Roundup Ready crops which removed all the material except for the crop, being removed from huge portions of the summer breeding area of milkweeds. Milkweeds used to grow in row crops, along fence lines, and so forth in that entire area, what they call the breadbasket, if you will. And so we lost that.

**Cathy Downs** [00:40:36] And then we had conversion of ranch lands in Texas, which I go over with you a little bit later. And we lost habitat there. We had huge population increases and fragmentation of properties, subdivisions and that kind of thing, and we lost habitat there. So we lost billions of stems of milkweed. We lost habitat.

**Cathy Downs** [00:41:02] So, that was one of the reasons that we saw the decline.

**Cathy Downs** [00:41:09] So, habitat loss was key here in the U.S.

**Cathy Downs** [00:41:13] We also saw illegal logging in Mexico. They were losing some of those oyamel fir trees to illegal logging in Mexico. There was habitat loss in the overwintering area.

**Cathy Downs** [00:41:27] There was habitat loss of nectar due to pesticide use. Even nurseries were selling garden plants with applied pesticides. So we saw habitat loss. Even when you were trying to do good by putting in nectar plants and milkweed, they were being treated with pesticides. So we were seeing habitat loss there.

**Cathy Downs** [00:41:53] There was a huge loss in population in 2016, in the overwintering area due to a giant storm in Mexico. We literally lost 33 million butterflies in 2016, which if you remember, was the population that we had in 2013. So thank God that didn't happen in 2013. I don't know how we would have recovered from that. But we were lucky enough to have a reasonable population in 2016.

**Cathy Downs** [00:42:20] But, trying to count the loss was a problem in itself. We had several numbers from several different organizations telling us what the loss was, and it varied anywhere from 7 to 50% of the population. So we ended up with a number to use that was around 33 million butterflies that were lost due to freeze.

**Cathy Downs** [00:42:46] Now, the interesting thing is, is monarchs can actually live up to about 19 degrees and still live. But if they get wet, and it falls below 32 degrees, they will die. And so, it was this combination that caused that huge loss due to the extreme weather.

**Cathy Downs** [00:43:09] We lost some butterflies due to drought in Texas for several years. We lost all our nectar plants. There was nothing to offer butterflies on their southern migration between 2009 and 2011. So we saw some losses there.

**Cathy Downs** [00:43:28] So, we can look at loss of habitat, fragmentation, losses in the overwintering area, extreme climate conditions. Hurricane seasons will sometimes create loss.

**Cathy Downs** [00:43:42] We look at new research saying that, you know - highway mortality.

**Cathy Downs** [00:43:48] For every research paper that comes out, there is another research paper that will tell you that something else is causing it.

**Cathy Downs** [00:43:56] And so, I find that, for me, monarchjointventure.org has a great deal of information. And that if you're looking either for information on the research, or information on how to help to minimize these losses, it's a huge, vast vault of information on all of these things.

**Cathy Downs** [00:44:26] So, we're saying essentially that we need a sustainable population of about six hectares. We think that it's possible. And U.S. Fish and Wildlife Service agrees. And we think that's one of the reasons that the listing was precluded, but warranted, that we with all of the funding and energy and cooperation going into mitigating the losses in habitat (we need about a billion more stems on the ground), that we can hope to see a sustainable population of about six hectares. We haven't reached that yet on a consistent level.

**Cathy Downs** [00:45:19] But I believe that all of those reasons are why we think it's declining.

**Cathy Downs** [00:45:26] And with our efforts, Fish and Wildlife Service thinks the listing is not necessary at this time.

**David Todd** [00:45:37] Okay. Well, that gives us a good introduction to some of the challenges that the monarch butterfly are facing.

**David Todd** [00:45:48] I know that you have not been just an onlooker to ways to try to protect and restore the monarch. And I was hoping that you might talk to us a little about some of the educational and restoration efforts you've been involved in.

**David Todd** [00:46:04] I thought, just as a place to start, maybe you could tell us about your role with the Texas Master Naturalist Hill Country chapter, which I think you joined in 2005. Is that right?

**Cathy Downs** [00:46:19] Yeah. I'd only been here about six months. It didn't take me long to find them, but I was kind of egged on to do that by a neighbor, a lovely, lovely neighbor. Her name was Bobbi Livingston. She's unfortunately gone now, passed away. But she was the first person that I met in Texas - lovely lady. Came across the street, or across the way. Across the street for me is about a quarter mile from her. So we live out in the middle of nowhere. And she came over and introduced herself.

**Cathy Downs** [00:46:54] And for the next three months, I think I dogged this lady. She knew every plant, every animal, every butterfly, every bird that existed in Texas. And I was on a relentless quest to learn every plant, every bird, every butterfly and every caterpillar in Texas. So I think after about three months of asking Bobbi all of these questions, she said to me, "Cathy, I think you could probably do really well by taking this class from the Texas ..., and joining this volunteer organization called the Texas Master Naturalists. And it was probably the best thing she ever did for me, and for herself.

**Cathy Downs** [00:47:36] So I did. I joined the group in 2005, in classes in August. And it never stopped for me. And after that, I did continue to visit with Bobbi, just to share with her those things. She had become a Master Naturalist in 2004, although I think she would have been better off teaching those classes than taking them. So she was the one that actually got me into the program and I can't thank her enough to this day.

**Cathy Downs** [00:48:07] But I had also, I had, when I, when we lived in Newburgh at the time and had a farm up there, they had been buying up houses all around and started subdividing land in the area. So the rural area there was starting to become less rural.

**Cathy Downs** [00:48:29] When I moved to Santa Cruz, San Jose had their dotcom explosion, and Santa Cruz became less beachy.

**Cathy Downs** [00:48:38] I moved to Atascadero, California, which was ranch land, and they changed, rezoned, my property, on my property line, to high-density housing.

**Cathy Downs** [00:48:50] So, when we came to Texas and found our place in Comfort, we thought, finally, we're not going to have to worry about seeing that happen. Now I find Boerne knocking on our back door.

**Cathy Downs** [00:49:01] One of the things that inspired me to continue in conservation education were those places that I had left. I saw those opportunities for rural land and conservation efforts failing.

**Cathy Downs** [00:49:20] So with that in mind, I was kind of motivated to read up on Texas conservation history and to really try to get ahead of that movement, if you will, because I saw Texas becoming populated, greatly populated, and I saw a lot of ranch lands start to be subdivided and so forth.

**Cathy Downs** [00:49:42] So when I started with Texas Master Naturalists group, I really had access to, especially in Hill Country, to some premium lecturers, some great training and some incredible mentors in the Hill Country.

**Cathy Downs** [00:49:59] I mean, people like Steve Nelle and David Bamberger, just some of the most incredible Texas A&M professors. And I realized how lucky I was to have access to that. And it kind of became my burning desire to share that information with as many children as I could because they were the hope for the future and with as many adults as I could, because Hill Country was becoming sort of a retirement community for Texas.

**Cathy Downs** [00:50:33] And we were seeing people joining Master Naturalists, a lot of them retirees from Dallas and Houston buying large tracts of land and moving into Hill Country. So that was a special group that we really needed to reach. They didn't know what to do with the property once they got here, but they were very good about wanting to do it right. And so that was a real group of people that we wanted to have access to.

**Cathy Downs** [00:51:08] So, with the monarch populations declining, it was sort of a no-brainer to get this monarch butterfly education out there and sort of an introduction to conservation. So, the opportunities that Texas Master Naturalist gave me was essentially an introduction to just about anywhere in Texas to begin with, because we have over 48 chapters in Texas. But our chapter was essentially four counties to begin with. So I had four counties to start out with in the ultimate retirement community of Texas. And so it was a really great place to start.

**Cathy Downs** [00:51:57] So, I started out with like gardening clubs, oh, boys and girls clubs, other homeowners associations, and that kind of thing. So, I started on the ground there, went to, went to, kind of like a Native Plant Society groups in the area, started working with Cibolo Nature Center. And so, I was using the monarch butterfly education part and I had been working on together and kind of went solo at that point from there.

**David Todd** [00:52:33] I see. Well, it's great how this, sounds like this, monarch butterfly story and the creature itself, are a wonderful vehicle to teach about, not just insects, but about conservation and restoration in general.

**David Todd** [00:52:51] Maybe we could talk about, you know, a few of the, you know, institutions and events you were part of. I think that you volunteered at the Butterfly Theater in Kerrville.

**Cathy Downs** [00:53:06] Yes.

**David Todd** [00:53:06] Maybe you can talk about that effort - what the goal and some of the activities were.

**Cathy Downs** [00:53:12] That was kind of my jumping-off place, as I said earlier. So the Butterfly Theater was essentially a demonstration garden for native plants, and we built it into more of a native plant education for butterfly host plants, essentially using the theme that, if you want butterfly populations to stay in your garden, then you need to do more than just plant pretty flowers, because essentially you're just going to be the "Buc-ee's of Butterflies". They're just going to stop and get their gas and move on.

**Cathy Downs** [00:53:50] If you plant the host plants for those butterflies, they're going to lay their eggs there and you're going to have the caterpillars. And the butterflies that emerge from that are going to see the host plants available to them. And you will have a constant supply of butterflies in your garden - the entire butterfly lifecycle, if you will.

**Cathy Downs** [00:54:08] And so, that education, in that butterfly theater, as we moved to that end, became kind of a magnet for groups to come in and tour. So, we were able to use the garden as an education center. We had Girl Scouts and Boy Scouts and kid camps would come in. We had Master Naturalist groups come in, even out of our own Hill Country chapter. Garden clubs would come in and do tours.

**Cathy Downs** [00:54:40] We did have a monarch larval monitoring site there, so we were doing monitoring in the garden. So, we would have visitors come in and we'd explain that to them.

**Cathy Downs** [00:54:49] We had all native plant species, pretty much. So, it became a great draw for people that were looking for native plant species to put into their own gardens. So, it became essentially a native plant species demo garden.

**Cathy Downs** [00:55:03] So, I was there as the volunteer project coordinator for ten years, and I dedicate all of my knowledge there to the person that had that part for me, who was Barbara Lowenthal, who has probably forgot about more host plants than I knew. She was a wonderful mentor and a great lady.

**Cathy Downs** [00:55:28] So, the Butterfly Theater was a great place. It's still in great hands. I moved out from there in 2017, and now Paula Harley is there doing a wonderful job as project coordinator and the Butterfly Theater lives on!

**David Todd** [00:55:45] That's great. It's, I guess, sort of a daisy chain of people who care about these things, and nice when you can pass it on to others who care.

**David Todd** [00:55:57] So, I think that from 2008 through 2018, you volunteered with the Texas Wildlife Association and I'd love to hear about that activity. And particularly, you know, your ability to reach out to some private ranches and landowners who, you know, may be difficult to approach in other ways.

**Cathy Downs** [00:56:23] It was a really great opportunity for me, and I really liked working with those people. You know, it's interesting because when I first started working with them, I was working with their Learning Across New Dimensions of Science program, and that is essentially for middle school children. It's an outdoor program and you work through stations and it's essentially a program for land ethics.

**Cathy Downs** [00:56:51] From there, I worked, they'd asked me to do one of their distance learning programs. When I got more involved with monarch butterfly education and had to draw back from working with the LANDS program, they asked me to participate in that.

**Cathy Downs** [00:57:09] So, distance learning was essentially, it was a live television program that they produced that would reach out to quantities of students. And I would do the program twice a year, once for spring migration, and once for fall. And so the program would run four times in a day, to different schools at four different times a day.

**Cathy Downs** [00:57:42] And with that program, and I was so happy that they allowed this, I could reach, I reached over 40,000 students in four years, in over 200 schools, in over 23 states, in over two countries, our ourselves and Canada. We had schools in there. I was able to interact with about three or four different schools in each program. So literally to ask questions of the kids in schools. They would choose like four schools out of who was there.

**Cathy Downs** [00:58:13] It was one of the most interesting and exciting things I did with kids, because knowing I could never reach that many kids in my lifetime, I didn't think, at the time. This was one way I was able to reach huge amounts of children that were so excited.

**Cathy Downs** [00:58:31] I would bring in live critters. We would have caterpillars and adults and we'd do tagging and life cycle, and we'd talk about migration. And they were so excited to see the live caterpillars and butterflies, and I was just really excited to have that kind of exposure to these schools. And it actually was their number one program.

**Cathy Downs** [00:58:53] But I did compete with bats. Bats for a big deal in October, right around Halloween, and I had to compete with bats, who also had a great had a great impact on kids.

**Cathy Downs** [00:59:05] Yeah, so, that was a wonderful thing.

**Cathy Downs** [00:59:07] I also worked with their Women of the Land program. I did a pollinator restoration as part of their program with Women of the Land, with essentially women landowners. And they did seminars with them, teaching women how to work large machinery, and how to do rotational grazing for women that own large tracts of land. And I participated in those programs doing pollinator and monarch butterfly habitat restoration for that program.

**Cathy Downs** [00:59:40] I did work on their board for a little while, their conservation board. Had a great run with Texas Wildlife, and to this day, I just really admire what they do for Texas landowners. It's amazing what their reach is.

**Cathy Downs** [01:00:01] Ranchers were a tough get with milkweed. It was tough to break the myth that milkweed will kill your cattle. But one of the myths that I was able to bust was that if you have a 1,000-pound animal, it would have to literally eat a trash bag, a hefty trash bag, full of milkweed to cause it any toxicity. And if that was happening, then you really needed to revisit your grazing practices, since milkweed is a disturbed land, first-priority species. So you really need to talk about better grazing practices here about cattle eating milkweed. And so we would have that conversation.

**Cathy Downs** [01:00:45] And I'll tell you what, private ranchers are the nicest people in the world. They're nothing to be afraid of.



**David Todd** [01:00:53] Well, that's great. And I think it's neat to have somebody like you who's willing to be patient and persuasive and, you know, speak to them in a way that they, you know, can appreciate and understand.

**Cathy Downs** [01:01:09] So I'll just break in here one second and say that the two things work together. So we would do the Land's program on private ranches. And so that gave me a chance to speak to the ranchers about the monarchs. And so when we would go on the ranch to do the Lands program, I would have the opportunity to speak with ranchers about monarch habitat. And so they were always wide open because I was already volunteering on another effort with them. So it worked great, hand in hand.

**David Todd** [01:01:42] Yeah, well, it's probably helpful that that you gave them an insight into something that they probably were not focused on, you know, thinking more about cattle or goats or sheep and forage levels. And here, you know, you are bringing in a whole other aspect.

**David Todd** [01:01:59] Well, so from 2009 to 2012, apparently you were a Nature Box educator at Cibolo Nature Center, there in Boerne. And I was curious if that brought you another avenue to talk about monarchs.

**Cathy Downs** [01:02:18] Well, yes, it did. The Nature Box program was essentially all of the Boerne ISD schools, so there were five or six. And we would go in once or twice a week with a science program into the schools and present a program to them for about 15 or 20 minutes per classroom. And a couple of my boxes that I presented were: one was monarch migration for the older kids. And we would do some math because you can use monarch butterflies for a lot of different applications in school. You can use them for science, you can use them for math, you can use them for art. There's a lot of applications.

**Cathy Downs** [01:03:03] I had a butterfly lifecycle program, which I would always use monarchs as the critters, as the example for the butterfly lifecycle. And I would introduce Journey North, which is a citizen science program asking for reports on your first sightings every year, your sighting of milkweed or sighting of eggs and so forth.

**Cathy Downs** [01:03:26] So, those three topics I could cover through the Nature Box program. Once we presented the program (usually I had another docent with me), we would leave a box of books and additional worksheets and color sheets and that kind of thing. We'd leave the box for two weeks. The teacher would continue the curriculum through the box and then return the box to the Cibolo Nature Center. So we were able to bring monarch butterflies into the Nature Box program that way.

**Cathy Downs** [01:04:03] And so, the Nature Box program itself covered a large amount of science projects. And the thing I really loved about the Nature Box program was they were always a great STEM (Science, Technology, Engineering and Math), a great STEM program. And that was one of the things about working with monarch, the monarch butterfly, that I really liked, was the science aspect of it and getting it into the schools is that it had great use of STEM - science, technology and so forth. It had great STEM capability and was easily accepted into the schools.

**David Todd** [01:04:53] Well, that's great. And it sounds like the monarch may have offered us a sort of tangible way to think about STEM, where a lot of those concepts are maybe pretty abstract.

**Cathy Downs** [01:05:05] It's amazing how much curriculum there is now, using the monarch butterfly.

**David Todd** [01:05:13] So, thinking more about education, I think since 2011, you have served as a certified trainer for the Monarch Larval Monitoring Project. And maybe you can teach us a little bit about what that involved.

**Cathy Downs** [01:05:31] The Monarch Larval Monitoring Project has been around for a long time. It's one of the original grassroots projects, if you will. Dr. Karen Overhauser essentially started the program when she was with the University of Minnesota. She's now with the University of Wisconsin Arboretum. And the Monarch Larval Monitoring Project is now under the Monarch Joint Venture umbrella.

**Cathy Downs** [01:05:59] But the Monarch Larval Monitoring Project is essentially a citizen science project, meaning we use and recruit citizens to report data, using volunteers from across Texas, actually across the United States and Canada. And so we're recruiting citizens in monarch research. And it was developed at the University of Minnesota to collect long-term data on larval monarch populations in milkweed habitat.

**Cathy Downs** [01:06:34] So, the actual goal of the project is really to better understand how and why monarch populations are so varied in time and space. So, we're looking for a focus on monarch distribution and how abundant are they during the breeding season here in North America.

**Cathy Downs** [01:06:54] So, as a Monarch Larval Monitoring Project volunteer, you're essentially, your contributions are helping to conserve monarchs, conserve their migratory phenomenon, which is the biggest advocacy issue here. I mean, with millions of monarchs, we don't really think of them. And I guess Fish and Wildlife Service has the same idea. You know, we don't really think of them as going extinct, when you think of an animal with 33 million in their population. But the monarch migration may be the thing that becomes extinct. They will no longer migrate. We won't have that phenomenon.

**Cathy Downs** [01:07:37] So, we want to advance our understanding of their ecology in general. So, that's the Monarch Larval Monitoring project.

**Cathy Downs** [01:07:45] So, essentially what you're doing is you're developing a site that has milkweed in it. You are counting the number of milkweeds in your site once a year. You're reporting that. And then at your own discretion, you can monitor once a week. You can monitor twice a month. You can get groups to monitor together. You're going to monitor each time how many eggs you have on the milkweed, how many caterpillars, or what stage the caterpillar is. You're going to see what kind of milkweed it's on. And then you're going to report that data back to the database at the Monarch Larval Monitoring project.

**Cathy Downs** [01:08:30] And, at the end of the year, you can essentially create your own graphs that tell you how you compare, for instance, to other years. Or, using the monarch, even in those spaces, as sort of an ecosystem indicator, you are going to see how the health of

your own monarch population is and comparing it to other sites. And Monarch Larval Monitoring Project actually issues a yearly report which you get.

**Cathy Downs** [01:09:03] And we're finding out that this information through citizen science is becoming really important in a lot of scientific research. Citizen scientists are now responsible for about 17 to 20% data on research papers that are being published. So it's a huge benefit not just to landowners for what's happening on the property, but to research on the monarch butterflies' capabilities for sustainability in the future.

**David Todd** [01:09:41] That's great. It must be very sort of affirming and validating...

**Cathy Downs** [01:09:46] Right.

**David Todd** [01:09:46] For regular citizens to feel like they can be a part of, you know, a robust research.

**Cathy Downs** [01:09:54] I mean, my part in that is to essentially teach them the basics on how to identify the different species. There are other species that may look like monarch larva. It's to show them what those different stages look like, how to report accurate data, how to enter accurate data, to continue training, what milkweeds are in their region, how to identify the regions. So I do training workshops that can be anywhere from 3 to 6 hours, depending on how much training they're asking for or needing. And then I do follow-up workshops, once a year usually, now, in the local area or for any sites area that just want to follow up or for new members of their team. That's my part in the training.

**David Todd** [01:10:48] Well, that's great. It's nice to share that information and, you know, hope that it propagates and multiplies.

**Cathy Downs** [01:10:56] Well, it has. I mean, we've increased our Monarch Larval Monitoring sites by about 45% since I began in 2013. So yeah, we saw a nice uptick in that.

**David Todd** [01:11:14] Well, that's great. And I'm sure that the research and data has been really helpful.

**David Todd** [01:11:23] So, another project, yet another project you've been involved with, is the Monarch Joint Venture.

**Cathy Downs** [01:11:30] Mmm hmm.

**David Todd** [01:11:30] And I think that started for you in 2011. Maybe you can talk a little bit about your role there and what the Joint Venture focused on.

**Cathy Downs** [01:11:43] The Monarch Joint Venture actually began in 2008 with a couple of partners, a couple of partners that we're actually discussing today - Mark Lodge, the Monarch Larval Monitoring Project, Journey North and a few others. By 20.., let's see, by 2016, they had about 75 partners and then today they have about 120 partners. So they've really moved along.

**Cathy Downs** [01:12:12] They're a national conservation partnership that work together to conserve monarch migration, basically. So as a national coordinating body, they help identify

opportunities for support and they guide conservation actions by various conservation organizations.

**Cathy Downs** [01:12:32] So, they're basically an umbrella organization, non-governmental - 501(c)(3) - and they're working to protect monarch migration. So their mission, essentially, is to protect monarchs and their migration by collaborating with partners to deliver habitat conservation, education and science.

**Cathy Downs** [01:12:57] So, I'll give you an example of the partners that they've partnered with in Texas. They partner with Texan by Nature, the Native Plant Society of Texas. They partner with the Cibolo Nature Center. They partner with Texas Parks and Wildlife. And that's just a couple. I won't go into more. But so here in Texas, they partner with quite a few.

**Cathy Downs** [01:13:23] They essentially, I worked with them, during the ... there's a timeline here, and that's kind of important to put in this day. I started working with them after we there was a tri-pollinator conference (and I just kind of have to slip this in here) in 2013 with Canada, Mexico and the United States. And that was in 2013 during the Obama administration.

**Cathy Downs** [01:13:53] And essentially they adopted the monarch butterfly as their symbol of cooperation. And it happened to be the same year that we had our lowest population in monarchs ever. And when President Obama returned from that tri-national conference, he put out a memo on pollinators on June 20th, 2014, and the priorities were to expand public education outreach, develop public/private partnerships to implement, increase and improve pollinator habitat, and conduct research to prevent further losses and recover populations of pollinators, and specifically toward bees.

**Cathy Downs** [01:14:37] And they had put a conservation group together to make this happen, and came out with a pollinator initiative that had quite a bit of money in it by 2015. So the Monarch Joint Venture helped to oversee, put these partners together, and distribute some of that funding. And they were key in making a Monarch Conservation Initiative.

**Cathy Downs** [01:15:08] So, they got all these partners together when the funding came out and they essentially prioritized what was needed to help go forward with that initiative. So, they were a key in helping this pollinator initiative preserve the funds in a way that was going to best meet those goals.

**Cathy Downs** [01:15:39] So, my part in that was to train new partners. I trained the Texas Parks and Wildlife at their annual interpreters convention. So, in other words, the interpreters were to go forward. Everybody had a mandate at that point. So Parks and Wildlife had mandates. Parks and recreation departments and the cities had mandates. Homeowners associations wanted to create mandates.

**Cathy Downs** [01:16:10] And so, it was crucial that they get the right information. So, even something as simple as the monarch's life cycle, people were not aware. They weren't aware of migration and they weren't aware of what milkweed was, or even how to identify it.

**Cathy Downs** [01:16:26] So, at that point, I went out and really started hitting the ground to work with those partners. And so that was essentially my goal with Monarch Joint Venture. They partnered with Cibolo Nature Center, and I worked through Cibolo Nature Center to get out there and do this work.

**Cathy Downs** [01:16:46] So, I worked with National Wildlife Federation so that we could develop a training workshop for monarch outreach interpreters because it was going to need a lot more than two feet on the ground at the pace I was going. And I promoted citizen science for start-up groups funded by pollinator initiatives and provided resources for start-up groups like handouts. And Monarch Watch started a milkweed program because milkweed was very hard to get a hold of at that time.

**Cathy Downs** [01:17:24] So, we were, we were essentially directing people where to go to find the things they needed to get the work done that they needed.

**Cathy Downs** [01:17:33] So, that was a wild couple of years, David.

**Cathy Downs** [01:17:40] It was great work.

**David Todd** [01:17:43] You know, it seems like a nice combination of some collaboration, but also some prioritization and some focus on the top that was carried out with all these different partners.

**Cathy Downs** [01:17:58] Well, it was confusing for some of those groups. I mean, a wildlife management area person who normally has to look for deer antler measurements is now mandated to plant monarch habitat, and they don't know what that means.

**Cathy Downs** [01:18:14] So, yeah, it was it was an interesting part of the history.

**David Todd** [01:18:22] You know, I think you mentioned, just in passing, Monarch Watch, and I think that, beginning in 2012, you became a Monarch Watch conservation specialist. And I would love to learn more about that program and what your role was there.

**Cathy Downs** [01:18:41] So, essentially, all of my positions are volunteer and this is another one. So Monarch Watch has a group, when I started in 2013, we had about ten of us. A conservation specialist for Monarch Watch is a regional advocate for monarchs and available for consultation in your region. For instance, Dr. Kiphart, who was my mentor, was a Monarch Watch conservation specialist. And I joined him as a Texas Monarch Watch conservation specialist.

**Cathy Downs** [01:19:16] So, Monarch Watch, it's out of the University of Kansas under Dr. Chip Taylor, who just retired this month and is now sort of director emeritus. And they cover a number of things. They cover a milkweed program which is free to schools and free for restoration purposes, but you can also buy milkweed plants from them.

**Cathy Downs** [01:19:46] They are in charge of the Monarch Waystation program, which when we started, I started with them in 2013, we had 178 Monarch Waystations. So a Monarch Waystation is a demonstration garden that includes milkweed and nectar plants. It can be large or small. Essentially, you register with Monarch Watch that you have a Waystation, and starts a conversation about conservation in monarch habitat, and you can list it in the Monarch Watch database. We had 478 of these when I started in 2015, and we now have over just about 1400 Waystations, which I'm really proud of.

**Cathy Downs** [01:20:38] They also do monarch tagging, which is essentially another way to track migration. You have a small, nontoxic tag adhered to the monarch hind wing before the migratory monarch is released. So you're literally going out and netting fall, migrating

monarchs, tagging them on the hind wing and then releasing them. And the tags are recovered in Mexico, generally from expired monarchs. So they're finding expired monarchs on the ground that have been tagged. Tags are reported back to Monarch Watch. And, the distance and the flight path of the monarchs are determined, and then reported back to the original tagger, who gets a certificate of appreciation. But, they use the tag essentially to find out, and it's a large database of information that's hoped to answer a lot of the questions we have, still, about monarch migration.

**Cathy Downs** [01:21:40] So, we also, as monarch specialists, do education. I've participated in some sampling for isotope research with them, and we do just consultation. If someone just has a question that's in our region, they'll email us through a Monarch Watch address and we can address their concerns by e-mail.

**David Todd** [01:22:01] Now, that's something I know nothing about. There's lots I don't know anything about, but the isotope issue, what does that research involve?

**Cathy Downs** [01:22:11] Well, you're essentially, what they're trying to do with isotope research, is a lot of questions now come up about where are monarchs getting their winter fat? Are they, should we be really concerned about nectar sources in Texas, or are they filling up in Minnesota and the Great Lakes and then just flying straight through Texas? And so, isotope research, essentially using, collecting a migratory sample and then sending it to a laboratory. And they're able to (I'm not sure where isotopes are located because I'm not a biologist), but their isotope is collected from the sample and they're able to determine what it ate, where it ate it, how much of it they ate.

**Cathy Downs** [01:23:05] So, isotope research has apparently a huge breakthrough in science. And I'm sorry, I can't give you more information than that, but I just know that through that research they're able to tell us where these monarch butterflies are getting their lipid, their fats in their abdomen. And by getting enough information through this research, we can apply our resources to the areas where the monarchs are telling us through research that they're getting the majority of their lipids.

**Cathy Downs** [01:23:43] So, if Texas is indeed a place where a majority of monarchs are getting their last meal before they head into the overwintering area, then we know that our resources are not wasted going into nectar seed mixes along right-of-ways in Texas, that if they're getting their nectar sources say from Michigan before they head down south. And our resources are better used if we move more of them to Michigan.

**David Todd** [01:24:13] I see.

**Cathy Downs** [01:24:13] So, it's a pretty ground-breaking research, only beginning, but I'm very excited about it. So, I was able to participate by collecting samples and so I'm in the loop in the research. It's pretty exciting.

**David Todd** [01:24:29] Yes, I mean, it sounds like interesting from kind of a basic research standpoint, just to understand more about the ...

**Cathy Downs** [01:24:36] So many questions.

**David Todd** [01:24:37] But also to apply it so that you can really be efficient with how you deploy limited, you know, funds and milkweed seed and so on.

**Cathy Downs** [01:24:47] And as most things, you know, the excitement doesn't always last. Even though the monarch is still showing ups and downs in their population. Monarchs won't always, and pollinators, won't always be the subjects of conservation and funding. So we need to get as much done as we can as soon as we can, while we still have the resources to do that work.

**David Todd** [01:25:16] Yes. You know, we should discuss that. I think that's a really interesting question.

**David Todd** [01:25:22] I wanted to just touch, though, on on another program that you work with.

**Cathy Downs** [01:25:27] Mmm hmm.

**David Todd** [01:25:28] And you can tell us about - and that is you're volunteering with the Fredericksburg chapter of the Native Plant Society, where I think there was a statewide program called Bringing Back the Monarchs to Texas. And, you know, can you talk just a little bit about what that entailed?

**Cathy Downs** [01:25:46] Sure. That was actually a brainchild that came up on the back of Monarch Watch's Bring Back the Monarchs program. And that started ... Bring Back the Monarchs program was the milkweed program, offering milkweed for conservation in school gardens. So Bring Back the Monarchs to Texas began at the Native Plant Society's state convention in 2012, where Dr. Taylor from Monarch Watch was actually the keynote speaker. And Dr. Kip Kiphart was there. I was there. And Lonnie Childs, the president of Native Plant Society, was there.

**Cathy Downs** [01:26:27] And somehow I got in that group and we were talking in the lobby after Dr. Taylor's keynote. And the brainchild was to come up with an idea on how to bring back the monarchs to Texas. And this is what we came up with, was we would do: Native Plant Society had done a program for a different kind of plant program, but we would actually develop a project where we would give small money grants to public or nonprofit groups for demonstration gardens, or Monarch Waystations, if you will, that would preserve habitat for monarch butterflies. They would include milkweed and nectar plants. And they would fill out an application. And essentially we would review the applications, make sure that they were within the parameters of what we were looking for, and we would provide them with up to \$400 for seed or plants to build their demonstration gardens. And then we'd went out afterwards and we'd review the garden, and make sure that they were doing everything that they had promised they would do.

**Cathy Downs** [01:27:57] So, my job essentially was to chair the program. I put together a, I recruited a committee, pursued donations, evaluated and approved the projects and then went out afterwards and reviewed the completed project.

**Cathy Downs** [01:28:15] It was really a lot of fun. We had some great projects. School projects were huge. We started out with only about, I think we had donations for maybe eleven projects in 2013. Then by 2016, we had 56 projects that year. So it built up pretty fast. And donations were easy to come by. People were very generous. Even the follow ups: school gardens were the hardest, because your science teacher would be moved to math, or your vice principal would get moved out of school. And a lot of the other gardens were very successful.

**Cathy Downs** [01:29:01] The program continues today under a third Monarch Watch specialist, conservation specialist in Texas, Carol Clark, who took over for me when I left last year. So, she's doing a great job with the program and it continues to be pretty successful.

**David Todd** [01:29:21] You know, it strikes me that there's this running thread that goes from, you know, your work with the Nature Box at Cibolo to this program at the Native Plant Society, where you're trying to reach students of different ages and educate them. And I'm curious, you know, what drives you, what interests you in this work with teaching and outreach?

**Cathy Downs** [01:29:50] Well, you know, I mean, I've done everything now from pre-K to graduate students. And I told you earlier what my own childhood was, I had a great childhood. And it really motivated me to want to reach more children.

**Cathy Downs** [01:30:06] I did a group out of Pasadena, Texas, that had never seen stars and never walked on grass. It almost makes me tear up a little bit.

**Cathy Downs** [01:30:18] I've tried to get women into science with my own disappointment in not having a science curriculum as a young girl. I'm very, I highly endorse STEM. We need to get a lot more of that in this country. We really need to get on that bandwagon and get our people interested again in science.

**Cathy Downs** [01:30:41] I've worked a lot with Title one schools, those children that never get a chance to see a lot of what kids in public school or Montessori schools might be able to see.

**Cathy Downs** [01:30:53] And I work really closely with getting children in nature. I actually tagged Monarch Butterflies with Richard Louv. School gardens are one way to get kids out in nature, even if that garden is in the middle of a parking lot, at least it is a garden, a place they can go and see something outside.

**Cathy Downs** [01:31:14] I think that it's really hard to think about our children not being interested. I had a girl at in the Lands program I tried to work with. She was in middle school and she got off the bus and she came to my station and she just looked at me and said, "I don't do outdoors, I just don't do outdoors." And that just broke my heart.

**Cathy Downs** [01:31:40] So, I want to try and create, first of all, an interest in nature for children, because they're naturally curious, just naturally curious about science. And if you catch them early enough, they don't have a fear of nature. They're not afraid of vultures. They're not afraid of spiders. They're not afraid of caterpillars. If you can make a caterpillar, and especially a monarch caterpillar, which looks very much like a cartoon character, you can get kids feeling comfortable with that.

**Cathy Downs** [01:32:15] And the next step is to walk in nature, to discover things that are only 12 inches. You give them a 12-inch perimeter. It's amazing the things you can find within 12 inches.

**Cathy Downs** [01:32:26] So, that type of thing to me is extraordinary. If you can effect that change in a child and get them from fear to wonder, and from wonder to joy, and from joy to



educating others. That's basically the path I took. I was lucky enough to have education as a young child and my path went to joy, and how I can share that with other kids.

**Cathy Downs** [01:32:56] So, the work that I did, I tried to do, to move women in science, tried to work with STEM, tried to work with Title one, kids trying to get children in nature, tried to work with school gardens. Those were essentially my personal directives. And then the rest of it took me where it would.

**David Todd** [01:33:18] Well, sometimes you just have to follow that star, I guess. I mean, I think you have that same curiosity that you're trying to promote in your students.

**David Todd** [01:33:28] Well, so some of the education and outreach, I think, was through events. And I thought maybe you can talk about a few of those, which might offers examples of how you might use an event to teach about monarchs and their conservation.

**Cathy Downs** [01:33:49] OK. Some of the monarch events that I did participate in were kind of a learning experience for me too. Some of them, I wasn't entirely comfortable with, or didn't think that I was qualified to do. I'll let it go at that and tell you about it anyway.

**Cathy Downs** [01:34:10] One of the very interesting things was the San Antonio Monarch festival, which they're running every year now. But, when it began, it began as sort of an offshoot of the Mayor's Monarch Challenge, which was put forth by the National Wildlife Federation. They put out a challenge to all the mayors in the country to take on consideration of 25 monarch habitat challenges. And you could choose anywhere from 3 to 25 of those challenges.

**Cathy Downs** [01:34:47] Most mayors did take on three resolutions: we'll talk about monarchs, we'll look at seeing what we can do about monarchs, and then we'll talk about looking at seeing what we can do about monarchs, and so that monarchs become the conversation in the city.

**Cathy Downs** [01:35:03] But San Antonio were one of the first ones in the country to take on all 25 challenges. And so when they did that, Monika Maeckle from San Antonio took on the first San Antonio Monarch Festival and it created an event for over 5000 people. And it was great. It was fascinating. And my part in that was to do a Monarch Joint Venture monarch life cycle booth, if you will. And we had, I don't know, hundreds upon hundreds came through that booth during the day. And I've never been involved in anything with those kinds of numbers of traffic. I had done butterfly pavilions before for kids at different events, but never anything with over a thousand people crossing through my little tent. So that was pretty amazing.

**Cathy Downs** [01:36:00] I did a Children in Nature national conference tagging demo with Richard Louv, which I mentioned just a few minutes ago. But what they didn't tell me was that the Obama administration was sending a couple of their Secretaries to the event, and so the Secretary of Education was there, and the National Park's director apparently was there. And I was supposed to do this tagging demo and presentation, but I didn't feel qualified to address those people, but you just put your hat on and get into it. And once you get into it, you know what you know. And so I felt quite comfortable doing it after that.

**Cathy Downs** [01:36:43] So, that was an extremely advantageous moment because children in nature was one of the big checkboxes for me, was to attend and participate in children in nature programs. So that was a great event that I participated in.

**Cathy Downs** [01:37:03] So I did participate in quite a few Texas Master Naturalist conferences where I did my workshops and I participated in several of the Native Plants Society of Texas state conferences, where I gave workshops there.

**Cathy Downs** [01:37:23] One of the ones that I was really happy and honored to be invited to present was at the Hill Country Alliance Leadership Summit. Another one where I felt a little bit awkward going in there, but these people wanted me to speak to them about monarch habitat. But again, once you get up there and start talking about what you love, it becomes easier. And they were great people. And I thought I had, I felt I had to do it because I lived in the Hill Country and these people were great, had great impacts on Hill Country decision making. And so, I felt like I really wanted and needed to attend that and give them the information that I did. So I was really happy to do that. So I presented to them the monarchs' impact on the Hill Country and what that meant going forward.

**Cathy Downs** [01:38:22] So, one that I was kind of proud of was Hutto ISD, outside of Austin. I did every Hutto ISD school. I did a monarch lab for all of them, and it culminated in an assembly at the end of the day. And so, essentially I was boots on the ground for over 1200 kids that day. That was a lot of fun.

**Cathy Downs** [01:38:49] I did a Southwest Monarch Summit put together by Texans by Nature and was able to work on the stage with Mrs. Laura Bush, who put together the Texan by Nature program. That was a lot of fun. It included Monarch Joint Venture, Monarch Watch and all the affiliates, I think that I talked to you about earlier. That was when the funding first went out for the Pollinator Initiative. So all of the, of the major groups from Monarch Joint Venture with their.

**Cathy Downs** [01:39:26] So, that was a really great event that I participated in. And there were lots of others, but I would say that those were probably the most memorable and had the greatest impact on events that I participated in.

**David Todd** [01:39:43] Yeah, it sounds like you were the Cathy Appleseed, you know, the Johnny Appleseed of the monarch world.

**David Todd** [01:39:51] So, you know, one thing that strikes me is that you have done a lot of this work, from what I understand, as a volunteer. And I'm always interested in, you know, the altruism that drives people to do these things that aren't, you know, giving you the usual rewards. And, you know, what is it that you think pushes you or encourages you to do this kind of work pro-bono?

**Cathy Downs** [01:40:22] That's a really good question. I ask myself that sometimes, too. But, you know, science changes when nature calls. And we really need to pay attention to the indicators, monarchs being one indicator. So when I started to realize that monarchs were just an indicator, they're amazing species and I'm very passionate about them, but they are only an indicator of what's happening. And after going through losing the farm, and going through Santa Cruz, and going through Atascadero and seeing what's happening in Texas, I mean, I really saw it as sort of a needs of service kind of thing. Someone needed to get out there and kind of put the word out. Reading about it wasn't really having the impact that we needed.

**Cathy Downs** [01:41:20] I have always been an arbitrator. I mean, I'm a middle child. And so, arbitration has always been my thing. I was an arbitrator in business, and so I felt like I

needed to get out there with a passionate word and bring people into that sphere with something that they could recognize. And so, the monarch butterfly was a way to bring people into a sphere that they would understand. They would understand monarch butterflies. They connect with them. And so it was an easy way to get their attention. Something that they were familiar with. Something that people are very, they're just very attached to. And it's an easy door to open to get into their, to get into their compliance, and be able to share with them how wonderful a world it would be if we could keep monarchs by doing that, by actually doing things for monarchs, too.

**Cathy Downs** [01:42:38] So, I also wanted to kind of offer children career choices that I didn't have, to be able to say to them, "Hey, you know, you can be a park ranger. You can be a butterfly scientist, a lepidopterist. You can have a future of joy in nature." I wanted to be able to say that and have something to back it up. To be able to let them be the people that were changing in science, be able to let them see the impact of their own work, to be as passionate about science as I wanted to be at the time. So offering children career choices was a big part of it too.

**Cathy Downs** [01:43:26] Needs of service was the other. People needed to know.

**David Todd** [01:43:29] Well, you know, it seems that you bring together a, you know, a really encyclopedic understanding of the science of monarchs, but also, it sounds like a deep-seated love of this insect as well. And I was wondering how you, you know, balance and see the connection between, you know, the science of monarchs and then this other effort to try to spur people to have some affection or concern, where they might want to conserve it.

**Cathy Downs** [01:44:13] Well, you can't have one without the other. So, you can't love the butterfly if you don't love the caterpillar. And you can't love the caterpillar, if you don't understand how to keep him healthy. In a marriage, you can't love just the fact that he buys you flowers. You have to love the fact that he won't put the laundry in the basket, too. So, you're sharing characteristics of a species, you're sharing the science of the monarch, so that people understand what an incredibly complex system we're messing with when we take away their habitat.

**Cathy Downs** [01:44:55] So, here's what happens. You know, we show pictures - we do - on slides of this beautiful monarch butterfly on a gorgeous big zinnia. Pictures of roosting monarchs on a lakeside and a big tree. And people are just oohing and aahing about that. And you show a picture of mowed or a disturbed property where they're subdividing and you just have houses and no, no, no green at all. And they boo or groan at that.

**Cathy Downs** [01:45:31] And so, you have to put emotion into the equation, so that they can listen to the science and understand that the monarch has more parts, it has parts to the whole. So you can't just save the butterfly. You also have to save the caterpillar. You have to save its antennae. You have to save his legs, his head, his thorax and his abdomen, because those are all parts that are going to be part of what you love about the butterfly.

**Cathy Downs** [01:46:09] So, you're looking at breaking down the species scientifically so that you know what all of the caterpillar's, all of the species', needs are, not just the part they love. So, you have to get the love first and then you have to break it down into the little pieces so that they know why the conservation effort is important.

**Cathy Downs** [01:46:33] So, we know the milkweed is important because the caterpillar needs it. We know that pesticides can't be used because the pesticides will kill the caterpillar. And so the science of breaking that caterpillar into different instars is important if you want to report research that's going to help bring resources to your area and that kind of thing.

**Cathy Downs** [01:47:03] So, everything's connected that way. So you love this animal, you love the sum of its parts, you love the research that's going into it. It's a circle. So you have to you have to save the parts to save the butterfly, to bring the research. And it's going to be a circle of all of the parts of it, so you can love the whole.

**David Todd** [01:47:27] That's well put.

**David Todd** [01:47:30] You know, earlier I think you said that that one of the challenges is to is to, you know, preserve folks' interest and attention. You know, there's so many distractions, I guess, in modern life that trying to get people to keep focused, and maintain that scientific interest, and maintain that love, can be difficult. And I wonder if that's something that you've seen in the work with butterflies.

**Cathy Downs** [01:48:03] There is an attention span, and I even have coined the phrase for it. I call the thing, "Monarch Conservation Fatigue". So I think that in America, specifically, in the USA, we have fads or trends. And so there's a new "Save the Whale", "Save the Monarch". You know, there are trends that happen. And we jump on these trends. And, we may stay on them for a while. And then we kind of get off that trend when the new trend shows up.

**Cathy Downs** [01:48:44] So I haven't heard about "Save the Whales" for a long time or "Save the Bluebirds", but I'm still seeing, and I'm still getting phone calls and emails, about saving the monarch. So this one has landed for a while, but it's because the monarch's not specifically about monarchs, it's about a much broader topic than just monarchs. Monarchs have been the ambassador for a much broader topic.

**Cathy Downs** [01:49:15] They're essentially talking for all insects. I mean, we're seeing insects disappear essentially in Europe. We're seeing China having to hand-pollinate their fruit trees.

**Cathy Downs** [01:49:33] And I think a lot of people are much more aware of that now than were aware of that before monarchs came to the fore.

**Cathy Downs** [01:49:40] We're seeing bee colonies disappear and now people have taken on beekeeping as an agricultural, you know, effort.

**Cathy Downs** [01:49:52] I mean, so monarchs essentially were the brand, if you will, that brought that to the forefront. When they heard that monarchs were disappearing, that opened up a door.

**Cathy Downs** [01:50:07] Monarchs are astounding. I remember monarchs from being a kid. We can't not have monarch butterflies.

**Cathy Downs** [01:50:13] But that brought something completely different. It brought exponential benefits, if you will. So by encouraging conservation for the habitat of monarchs, we also brought good mowing practices, and good pesticide practices, and essentially exponential benefits to soil and water conservation. So everything that we did, essentially,

through monarch habitat conservation is having a ripple effect out there. And maybe that's why monarchs haven't faded yet and why monarchs are still getting attention as opposed to the cave salamander.

**David Todd** [01:51:01] Yeah, well, it's probably a token too, that there are people like you who have worked hard to keep people from drifting.

**David Todd** [01:51:12] So something else, and maybe you've touched on this a few times, is that there's something about the monarch butterfly that seems to be compelling, appealing, attractive for people to just generally get involved in learning about the natural world and maybe getting engaged with conservation. Is that something that you could maybe talk about if that's something you've experienced?

**Cathy Downs** [01:51:42] Yes, I definitely think so. I mean, they are, they are. And I'll say it again, they're ambassadors. They're just a wonderful ambassador. It opens conservation on a very positive note, even though talking about some of the topics that monarchs open might be controversial or political, monarchs are a topic that you can talk about to anybody, and you're not going to be canceled. You're not going to have a political conversation.

**Cathy Downs** [01:52:14] But they open the door to anyone. I mean, there are very few people that don't know what a monarch butterfly is, or don't have some nostalgia or recognition of monarch butterflies. And when you talk about a monarch butterfly, it's a very safe topic in this crazy day and age when you have to almost be careful what you're talking about or who you're talking about to. So monarchs are non-denominational. Monarchs have no party affiliation. They have history, brand, nostalgia, recognition, curiosity, wonder. So you can always open a monarch conversation on a positive note. I mean, there's no downside to this animal that does act as a great opening for conservation in wildlife.

**Cathy Downs** [01:53:11] I mean, it's a direct source to pollination, other pollinators. It's a direct source to what kind of garden you want to plant. It's a direct source to, you know, what do we do about the water issues in Texas, and what do we do about the feral hog? I mean, it leads to other conservation conversations, that you might want to open because it opens everything on a positive note.

**David Todd** [01:53:45] I like the way you put that.

**David Todd** [01:53:50] You know, one thing I think you had mentioned before we started recording and that I thought that was very powerful, is that you seem to see, and maybe this is for people in general, maybe for yourself in particular, the idea of the butterfly as kind of a metaphor for our own lives and, you know, the ability for us to change and evolve, have new stages and new chapters in our lives. And is that something that you could comment on?

**Cathy Downs** [01:54:29] Well, it certainly was for me. When I started doing public outreach and education, it was in very small groups that I started with. And I'm really not a public speaker, David. So I know that sounds funny coming from someone doing the kind of outreach I do. But you put a hat on and you go out there and you say what you need to say. But I started with very small groups like 15, 12, 15, 20 people, and I was comfortable with that because they were people I knew, other Master Naturalists. And then they kind of moved on to larger groups like garden clubs and whatnot, and I learned to get comfortable with that. And after the first few minutes, I wouldn't be so nervous.

**Cathy Downs** [01:55:14] But then I remember my first group like at the Houston Zoo, and I thought, I'll never do this. I am going to be so nervous and I'm never going to be able to say what I need to say. And I put that hat on, and I pushed that envelope, and I went out there and I did it. And once I got talking about my monarch butterflies, I felt very comfortable. And I went forward. And I did what I needed to do. And I felt very satisfied with that.

**Cathy Downs** [01:55:39] And then, the groups got larger and the people that I had to interact with got more and more, let me say, "recognizable" in the community, my community anyway. And then it got to the national level. And then I got really nervous and I found that through all the years of education and outreach, as the audience grew, and participation grew and then the, you know, the impact grew. And so then, the level of knowledge and the level of the people involved grew. And I didn't think I would ever make it through that.

**Cathy Downs** [01:56:18] And that monarch butterfly brought me through, made me a better person, made me a public speaker, whether I wanted to be one or not, and then literally saved me from making a fool of myself through those times.

**Cathy Downs** [01:56:34] And I had some huge growth in those years. So I would never have... If you had asked me twenty years ago, would I be doing that at that time? Would I be on the same stages as Mrs. Laura Bush, or Dr. Chip Taylor, or any of those people. I would have said, "Not in your wildest imagination." But I did it.

**Cathy Downs** [01:56:54] And I resolved to do it for good reasons. And with something like the science of a monarch butterfly to pull me through in the background, I had my dad to support me and my husband and the butterfly itself and the science that went along with it. I had amazing growth and internal growth.

**Cathy Downs** [01:57:16] And I honestly believe that, you know, this butterfly's history and its future was relevant to that growth. I mean, it made a difference to me that I had to do this thing and I had to get that information out that made a difference. And it gave me personal growth and it gave me courage to go out there and do that.

**David Todd** [01:57:44] I like the way you put it, that you put your hat on and go out and do what you have to do.

**David Todd** [01:57:51] Well, you've been so helpful and generous in telling us about all these different things that you've done. I don't want to eat up your whole day. And so, I thought maybe we might start to close down. And I want to just ask one last open-ended question, and that is, is there anything you'd like to add about monarch butterflies or more generally about wildlife education and conservation?

**Cathy Downs** [01:58:18] Well, you know, I was kind of looking at Texas trends this morning because, you know, like I said, I've seen trends happen in other areas that I've been. And I love Texas. And I just especially love the fact that Texas is 93% privately owned and stewardship of all that has been in the hands of single families for generations. But, the trends I'm seeing now are a little concerning, and I just see the need to communicate the public benefits of private lands as much as we possibly can.

**Cathy Downs** [01:58:50] Right now, 40% of that private land is absentee ownership. And that, you know, we've lost about 2 million acres of habitat, monarch habitat, in Texas. I'd like to see us get some of that back. Economic growth and population growth is kind of driving the

demands for rural lands. And that creates kind of a high land value, which creates incentives for more fragmentation. And our land trends show that younger generations are less tied to the land. We have lots of working lands and fragmentation and loss of cover, and our landowners are aging and in the next 20 years we'll probably see the largest intergenerational transfer of land in the state's history.

**Cathy Downs** [01:59:36] So I hope that we can work on educating our children even further and that we can instill in them the same values and ethics that our parents instilled in us, that my dad and mom certainly instilled in me.

**Cathy Downs** [01:59:55] And that is to know that, you know what? They're not making land anymore. And they're not going to make land anymore. And that we have to understand that nature is the thing that's going to be best suited to our personalities, are going to be best suited to our well-being, and it can be best suited to creating a better life for us all. And then I hope that I won't be the only one out there pounding the ground in Texas, telling people how to be good stewards of their land, and the monarch butterfly will benefit from that too.

**David Todd** [02:00:28] Well, that is a very nice summary of much of what you've been doing and thinking about and telling folks about. So maybe we should just say, "That's a wrap!"

**Cathy Downs** [02:00:41] That's a wrap.

**David Todd** [02:00:43] Thank you very much, Ms Downs, and I appreciate what you've done today, and of course, of your years of talking to many, many people besides myself.

**Cathy Downs** [02:00:53] My pleasure. You've been, you've been a wonderful communicator, David. I appreciate it.

**David Todd** [02:00:59] Well, I wish you well today. Thank you again for your time. And I will, I guess, call the day and let you get back to what other useful things you probably have on your list for today.

**Cathy Downs** [02:01:14] Okay. Thank you so much.

**David Todd** [02:01:16] Thank you. Take care. Bye, now.

**Cathy Downs** [02:01:18] Bye.