[crickets]

[cymbal plays]

[chime]

[music plays]

[LEAL:] I was very lucky to grow up in Puerto Rico. When I was a little kid, I used to spend hours catching lizards, and to me that was amazing. So I've been with lizards all my life basically, and chasing lizards, or chasing things that move made me happy. I never though I could make a living chasing lizards. I pinch myself sometimes thinking that people pay me to chase lizards.

[NARRATOR:] Manuel Leal is a scientist at the University of Missouri. Every year he returns to his native home of Puerto Rico to study the biology of local lizards, and in particular how they navigate through their environment.

[music plays]

[NARRATOR:] Most of Manuel's work focuses on a group of lizards called anoles, the most abundant lizards in the Caribbean.

[LEAL:] So right now we're at El Verde field station and it's attached to my heart because I have been coming every year for over 25 years. Right now I'm working with Anolis gundlachi.

[NARRATOR:] If you catch an Anolis gundlachi and look at it, it has a beautiful yellow chin, which is why Puerto Ricans call this species the yellow-bearded or yellow-chinned lizard.

[bird calls, rustling] Like other anoles, Anolis gundlachi are territorial. They live in areas about three meters in diameter and will defend these areas aggressively from other males who approach. Years ago Manuel made a surprising observation about this lizard's behavior.

[LEAL:] I did a project here 20 years back looking at interactions between Anolis gundlachi and Anolis evermanni.

[NARRATOR:] Manuel wanted to see if there was competition between these two lizards. In one experiment, Manuel removed Anolis gundlachi from their territories to see how Anolis evermanni would react to the change.

[LEAL:] I was removing Anolis gundlachi from plots and I would come the next day and my intuition was that, in couple days... were on those three that I have worked really hard to get them out.

[NARRATOR:] But how were these lizards navigating back home? Were they running around randomly until they stumbled on their tree? Or did they actually know where they were going? To answer these questions, Manuel is trying something that's never been done before with anoles. He plans to radio track the lizards.

[speaking in Spanish]

[LEAL (narrated):] Because they're territorial, where we find an adult male, we assume that's his territory. Got it?

[LEAL (narrated):] First you have to go and catch the lizard and go back and measure them.

[NARRATOR:] Manuel measures and weighs the lizard.

[LEAL:] So this is 66.

[NARRATOR:] Because he will attach a small transmitter to it and wants to make sure that the transmitter isn't too big, so that the lizard can still move around the forest.

[LEAL:] These are the little tags. They are .33 grams. Basically what we're doing is we're gluing it like a backpack, so very tiny transmitters and that allowed us to look at the path that they will be taking back.

[NARRATOR:] Manuel puts the lizard into a plastic bag and then inside an opaque box to prevent it from seeing or smelling where it is going and use those clues to guide its return. He spins the box to disorient the lizard, waits five minutes, and then walks an indirect path to arrive at a random location 80 meters from the original territory of the lizard--a distance about the length of a football field. Manuel spins the box a few more times to disorient the lizard, like a kid with a birthday pi√±ata. Finally, he removes the lizard, releases it onto the new tree and wishes it luck on its journey home.

[LEAL:] Looks good. Ready to go.

[Speaking Spanish]

[NARRATOR:] Manuel, his wife Lourdes Oteiza, and their colleague Dave Steinberg repeat this procedure with 15 lizards. Now, they're ready to find out where the anoles go next. Each lizard's transmitter produces a unique signal which is detected by an antenna attached to the researchers' headphones.

[LEAL:] So this is the front of the antenna. And as you point it in the direction where the transmitter is, the beep get louder. Beep, beep, beep, beep, beep, beep.

[NARRATOR:] Using telemetry, Manuel and his colleagues look for the lizard and record its precise location at two- to four-hour intervals.

[LEAL:] Here we go. There's a lizard right in that palm tree. I told you they will make it back. I think it's the time for the [noise]. People say you cannot do telemetry in the forest. He's telling you, hey.... This guy walked 80 meters back here in less than 24 hours. There you go. That's his house. And because we have transmitters for the first time we know the points and it turns out it's a straight line. They walk 80 meters back to their perch. What are they seeing, that's the real key question here. Honestly I have no idea how they make it.

[NARRATOR:] In this experiment, Manuel and his team transported 15 radio-tagged male anoles 80 meters from their original territories. Based on the size of these lizards and the distance they were transported from their territories, it was almost impossible that they could find their way home by wandering around randomly. Telemetry data showed that three lizards headed away from their territory and never made it home. Remarkably, 12 lizards immediately headed in the right direction. Seven of those 12 lizards never quite made it home. But the remaining five lizards made it back to their original tree, and all five of them did so in less than 24 hours. These results tell Manuel that the lizards aren't just wandering around. They know what direction they need to go to get home. But understanding how these lizards are navigating will take more work.

[LEAL:] There's a strong desire of this lizard to get back to his territory but how they do it, I don't, I don't really know. I would like to know. There's a lot about anoles' behavior in nature that we know very little, but I think natural history's the building blocks for further questions. The idea of going to the forest and sitting down, for 30 minutes or 40 minutes, and seeing what anole does, immediately you come out with some other three questions you didn't have before. They're all the time doing things that you didn't thought before. You have to let nature talk to you.

[music plays]