Video Transcript - How to Discover a New Mammal Species

Maggy Benson: (upbeat theme music) Wow.

Maggy Benson: (Laughter)

Maggy Benson: [00:00:30] Hi. Thank you so much for joining us for another episode of Live from Q?rius Smithsonian Science How? We have a really awesome show today. We're going to explore how to discover a new mammal species with zoologist from the Smithsonian's National Museum of Natural History, Dr. Kris Helgen. Kris, thank you so much for being here with us.

Kris Helgen: Absolutely, Maggy.

Maggy Benson: We're really excited to learn about how you discover new mammal species and what that really means for animal biodiversity [00:01:00] and even environmental change, which are pretty big questions. But I think we should start at square one. Can you tell us what a mammal is and what you do as a mammalogist who studies them here at the museum?

Kris Helgen: Yeah. As a mammalogist, I'm a scientist who studies mammals. Those are the animals that have ... so familiar to us. They have hair. They feed milk to their young. And that includes things that are so familiar like dogs and cats, our pets, our farm animals. But in my case, I study wild mammals of all kinds all [00:01:30] over the world from the smallest bats and mice all the way up to things like elephants and whales.

Maggy Benson: In museums, we tend to use the word biodiversity. Can you just tell us what biodiversity means and how you study it?

Kris Helgen: Yeah. Biodiversity is just simply the richness of life on our planet, all of the life that makes up our world. In Natural History Museum, we often explore really basic questions like, "How many species of mammals are there? Where are they distributed? Where do they live? Which one are rare and common?" [00:02:00] Those kinds of really basic questions. They seem simple, but they're pretty tricky to figure out, and the collections we have at a museum like this behind the scenes are the best tool we have for figuring out those answers.

Maggy Benson: Now Kris, you are pretty much science's rock star for discovering mammals here at the Smithsonian. I don't know if you appreciate me putting it that way, but you've discovered over 100 new mammal species. How do you do that?

Kris Helgen: Well, what I've got to do [00:02:30] is just keep my ear out for any kind of information, like a mammal detective that's gonna lead me down a path towards a species that scientists aren't aware of, and there's a number of ways that I do that.

Maggy Benson: Well, let's not give it all away now. Let's ask our viewers where they think they'd start.

Kris Helgen: Let's ask.

Maggy Benson: Viewers, here's an opportunity to participate in a live poll with us. Tell us what you think. Zoologists find new species by searching in the wild? talking to other zoologists? examining old specimens? [00:03:00] or collecting new specimens? Take a moment to think about it and put your answer in the window that appears to the right of your video. This is the same place that you can pose questions for our expert, Dr. Kris Helgen, to answer on air today.

Maggy Benson: [00:03:30] So, our viewers are kind of split. We have 50 percent saying that examining old specimens might help you discover new species, but a lot of people, too, 33 percent think searching in the wild might help you.

Kris Helgen: Well, both of those are good answers. Both of those are right. In fact, all of the answers are right.

Maggy Benson: So, you do all of those things to try to discover new species.

Kris Helgen: A little bit of a trick question. All of those things are important [00:04:00] ways that we might find out some information that would lead us to discovering a new species.

Maggy Benson: One of those items on the list was going out into the wild. I mean, what is it like to go out into the field to launch an expedition looking for a new mammal?

Kris Helgen: Absolutely it's one of the most amazing things that we can do from a museum is launch an expedition out into the wild, into a place that may be very little explored by scientists and see what we can find. It might be anywhere [00:04:30] from two weeks to several months setting up camps and working with local people and setting up scientific stations and labs to try to document, paint a full picture as possible of what's living out in these areas. And oftentimes working as teams, working on plants and insects, and birds, and mammals. Trying to figure out everything that lives in a place.

Maggy Benson: How do you know where in the world to start? Where do you go to figure out where to put your flag down?

Kris Helgen: There I take clues from museums, too. I look across [00:05:00] all the world's natural history museums that have these wonderful collections made by expeditions in the past, and that tells me where scientists have gone and explored before, and I can see where these species have been discovered all over the planet before. And we can also then use that to find the blank spots, the white spots on the map where maybe no scientist has gone to see what's

there. And it shouldn't' surprise us that maybe that's the place to go to find something new.

Maggy Benson: Here on this map, we see some areas in red. Is that where higher concentrations [00:05:30] of species live?

Kris Helgen: Exactly. So, you see the tropics there, the tropics surround the equator. That is where life is at its richest. And the tropical rainforest, the most rich environment for animals and plants on our planet. You see some of that red, it shows there's lots of biodiversity, lots of life in those areas, lots of species. But as you move along to the right, you can see that in places going out into the Pacific like New Guinea in particular, it's getting blue and green. That probably doesn't mean [00:06:00] that there's not so many species there. It probably is a clue that that's places less explored than some other areas.

Maggy Benson: Do you use another tool in helping you decide where to go, because there were a lot of blue and green areas there on the map? Do you use the museum's collection, for example, here at the Smithsonian?

Kris Helgen: Right, absolutely. We're also kind of interested not just in the white spots on the map but more of the blind spots in the animal family tree and for mammals, what I'm often looking [00:06:30] for is those groups that are less well studied than others. There are some groups of animals, think about like elephants or great apes, where many different scientists might be studying them. But there are others, like rodents or bats, where there are so many kinds of species and so many specimens in a museum collection like this, but very few people studying them.

Maggy Benson: Interesting. So, you're actually looking at the collections and putting together the information that you have based on museums to [00:07:00] see where those blind spots are, really.

Kris Helgen: Right. Exactly. Exactly.

Maggy Benson: And here we see what?

Kris Helgen: Here we can see all the mammals in the world today living on our planet broken down by number of species. So, the blue piece of that pie chart you can see is the biggest, that's the rodents. Almost half of all mammals are rodents. And then red is bats and so on. Here are those groups highlighted on a family tree. These are not the only groups of animals I study, but just think about it. If these groups like rodents and bats have so [00:07:30] many species and so few experts studying them, that's a pretty good place to focus as a scientist on finding something new.

Maggy Benson: Can you actually discover something just by looking in the museum collection and never going out into the wild?

Kris Helgen: You can and we do it all the time in a museum like this one. Here is an example right here. So, I have brought a skull of a flying fox, which is a very large bat. And this particular species has only ever been found out in Samoa, an archipelago out in the Pacific Islands. This is [00:08:00] a broken skull, but it teaches us a lot about the animal and believe it or not, this skull has been here since the 1840s.

Maggy Benson: Wow. And this was discovered as a new species?

Kris Helgen: Yeah. So, I named this species just a few years ago. Scientists hadn't realized it was distinct from other bats that live in the region and I will also say, there are flying foxes out on the Samoan Islands still, but this particular species, no one's been able to find it since the 1800s. We think it's extinct.

Maggy Benson: Wow, [00:08:30] so you've made this discovery but you've never actually been able to see a living species.

Kris Helgen: Right. And it shows how important the collections are that this is our only way that we would know that this animal even existed, that somebody went out on an expedition, collected it 150 years longer ago, and it's been here and looked after in the museum ever since.

Maggy Benson: So, we're talking a lot about discovering new species. Can you tell us what a species is?

Kris Helgen: Yeah. Most scientists will define species by [00:09:00] essentially how different they are from any other organism, and often that's measured in terms of whether they can reproduce and ultimately the length of time two species haven't been reproducing, haven't been able to do that, that increases the genetic distinction between them over time. They become ever more different gene pools.

Maggy Benson: Can you tell the difference of two species just by looking at them?

Kris Helgen: Yeah, you can, and that's one of the ways I in particular study this material. I am often [00:09:30] cluing into anatomy. We might take two species of little brown bats. They might look to the non-expert very similar, but I'm cluing in the differences in the skull and teeth and other aspects. Another example would be these spotted cats. One is an ocelot, one is a margay. Very different animals. They appear similar, though. And the final example I've got there is warthogs. There's two very different species of warthogs in Africa, and we have to look close at the facial features and the tusks and the teeth to tell them apart. That's [00:10:00] usually where I'm starting, from looking at those differences in appearance to make my assessments.

Maggy Benson: If you're not an expert like you, are there new tools and technologies that you can use or look back on that other experts have used to be able to tell the difference between two animals?

Kris Helgen: Definitely. Like I said, if species aren't reproducing, they're becoming genetically more different and so we can use clues from their DNA to see how different they are and to determine if we think they should be a separate species or not. So yeah, increasingly DNA is the way that scientists are [00:10:30] studying these issues.

Maggy Benson: And Kris, last week you showed me some of the collections and you actually told me that you can extract DNA from some of these old specimens, that you never had a living animal to see.

Kris Helgen: Right. It makes this an incredible resource when you think about all the genetic material locked away in these specimens in our museum, millions upon millions of specimens.

Maggy Benson: You showed us a great example when we were behind the scenes of the thylacine.

Kris Helgen: Yes.

Maggy Benson: Let's take a look at that now.

Maggy Benson: [00:11:00] Kris, this is an incredible specimen. What is it?

Kris Helgen: A really special animal. It's called the Tasmanian tiger, or Tasmanian wolf, or thylacine. This was the largest marsupial predator of modern time. Marsupials are a big branch of the mammal family tree that tend to have very short pregnancies and oftentimes raise their young at first in a pouch.

Maggy Benson: Does that mean it's actually related to a kangaroo?

Kris Helgen: Must more so than to most animals we're familiar with. Even [00:11:30] thought his animal looks a lot to people like a dog or a wolf, those two animals, the Tasmanian tiger and dogs could hardly be less related. It's sadly pretty recently extinct. The last one died in 1936.

Maggy Benson: How did we come to have a Tasmanian tiger in our collection?

Kris Helgen: These animals actually lived their lives at the national zoo, and then they came to the museum afterward.

Maggy Benson: What kind of information does this animal give you since it's extinct and it's in the collection that could be [00:12:00] new to science?

Kris Helgen: Well, think about it. The only way we can study it, because it's extinct, is through these museum specimens, and one thing is we've been able to study its DNA. We've actually sequenced part of the genome of the thylacine from some hairs plucked off the back of this very specimen.

Maggy Benson: Just a couple hairs?

Kris Helgen: A lot of DNA from a really little sample.

Maggy Benson: And what have you learned from that?

Kris Helgen: We've been able to show exactly where in the marsupial family tree this animal belongs, which was a mystery. It's so unique. But it's also started to teach us [00:12:30] things about genetic diversity and how this species became extinct.

Maggy Benson: So, it's really providing you with a lot of new information even though there aren't any living animals today.

Kris Helgen: Right. And the only place where we can come to study them is in a museum like this.

Maggy Benson: Thank you for sharing, Kris.

Kris Helgen: Of course.

Maggy Benson: Kris, here's the thylacine. It was a really beautiful specimen, I'm sure, when it was alive as we see here-

Kris Helgen: It was gorgeous, gorgeous animal.

Maggy Benson: It was really interesting to learn a little bit about how you're getting new information from it. But what did happen to the thylacine or the Tasmanian tiger?

Kris Helgen: [00:13:00] It was a tragic story. When Europeans first came to Australia, that animal was found only on the island of Tasmania south of the mainland of Australia, and they imported sheep. Sheep farming was an important industry and sometimes the thylacines would hunt and eat the sheep, so they were persecuted. They were heavily hunted for generations, and ultimately that led to the population almost disappearing. Some of the last thylacines seem to have been affected by a disease possibly as well. So, maybe a one two punch [00:13:30] of heavy hunting and a disease. By the 1930s, they were gone.

Maggy Benson: Wow. It's really a very sad story, but it really shows the importance of your work in the museum collections and out in the field to basically understand biodiversity now and even extinction stories.

Kris Helgen: That's right. These are invaluable time capsules, absolutely, each one of these specimens.

Maggy Benson: What kind of questions, what kind of key questions are you asking when you're looking for new species?

Kris Helgen: I'm interested in these fundamentals of biodiversity again, how many species are there, [00:14:00] where do they live, what do they do for a living, which ones are common and rare, but also I'm interested in using collections to document the way that the world is changing, that environments are changing through time.

Maggy Benson: Great. We have a lot of student questions coming in. Let's get to some of those.

Kris Helgen: Okay. Great.

Maggy Benson: This one comes from Eagles Eye Academy. "What are the steps you take when you find a new species?"

Kris Helgen: That's a great question, you guys.

Maggy Benson: He's revealing his secret recipe.

Kris Helgen: Absolutely. There's a real process. When we think we have something new, it's a careful combination of [00:14:30] oftentimes anatomical and genetic studies like we've talked about to really demonstrate that, but then we can also as a scientist choose a name that we want to call it. For example, this flying fox is named *Pteropus coxi*. There are various ways to choose that name, but it falls to the scientists. That's part of the process. It's a lot of fun.

Maggy Benson: This question comes from the students watching in our Q?rius lab here at the Smithsonian. "How long do expeditions normally [00:15:00] last?"

Kris Helgen: It can be really variable. It depends on the mission of the expedition. It might be looking for a particular species. It might also be painting a detailed picture of all the life in a particular region. What we usually do is go from one or two weeks up to several months and focus on studying a particular place.

Maggy Benson: I want to talk about some of those places that you have been. I know New Guinea is one location that you go to. Can you tell us where New Guinea is and why that's one of your favorite places to [00:15:30] discover new species?

Kris Helgen: New Guinea is top of the list for me and that is a lot of reasons. It's historically not so well studied by scientists. It was part of that blue part on the map, so it's a good place, good target for discovery. Also, it's an island. You can see it there. It's the world's largest tropical island and it's situated just north of Australia. It hasn't always been an island, though. You can see in the past in the recent ... not so distant past, something like 15 or 10,000 years ago in the last glacial [00:16:00] cycle, the world gets a little colder, there's more water in the ice caps. Sea levels go down and you can move between Australia and New Guinea, and that's happened many times over time. New Guinea is its own island, but it's had these repeated connections to Australia.

Maggy Benson: It's nice to have a little bit of background on New Guinea. I think we should ask our viewers why the biodiversity is high. What do you think?

Kris Helgen: Yeah. Let's ask. Let's see what people think.

Maggy Benson: Our viewers, use some of the clues that Kris has just given to think about our next poll questions. New Guinea has high biodiversity because it has [00:16:30] tropical climate? no people? low predation? geographic isolation? or lots of shoreline? Take a moment to think about it and put your answers in the window that appears to the right of your video.

Maggy Benson: [00:17:00] Most of our viewers, 86% think geographic isolation leads to high biodiversity in New Guinea. How'd they do?

Kris Helgen: Right on. That's the best answer there. New Guinea's isolation is key. It's an island, yet it's had this repeated connection and isolation. Also within the island of New Guinea, there is a lot of isolation by different kinds of mountain ranges and major river valleys, so you see that New Guinea topography. There you see it on the ground.

Maggy Benson: Where the red went through the middle?

Kris Helgen: Absolutely. [00:17:30] It's a very complex landscape and one of the answers that people were smart not to pick was "no people". That wasn't right at all. There have been people in New Guinea for a very long time, 50,000 years. And that's been, that geographic topography, that complexity has shaped a great diversity of languages and cultures as well as different species.

Maggy Benson: What kind of species have you discovered in New Guinea?

Kris Helgen: A range of things. One of my favorite, though, is an animal called the [00:18:00] Bosavi giant woolly rat.

Maggy Benson: How giant are we talking?

Kris Helgen: This is a pretty big animal. It's about three feet long, half of that is tail. You can see it right here. This is its face.

Maggy Benson: Oh, it's pretty cute.

Kris Helgen: This is, I call this a handsome rat. This is a good looking rat right there. It has this really thick, kind of gorgeous woolly fur, hence its name, the woolly rat. This was a special discovery. It was found on a mountain called Mount Bosavi, and that is a really isolated peak. So, it built [00:18:30] itself up about a million years ago as a volcano out of a flatland of lowland forest. Over time, that volcano became extinct and plants and animals colonized up to the top and those animals up at the top in this colder climate became very different than those down below, and

this ... We were several years ago the first team to really get in and explore the crater of this extinct volcano, and one of the treasures that we found inside was this gigantic species of rat, so new to science that we haven't even [00:19:00] given it its scientific name yet.

Maggy Benson: And there's the crater. Wow.

Kris Helgen: There it is. Imagine peeking over that.

Maggy Benson: That's very exciting.

Maggy Benson: Have you discovered anything else in New Guinea and have you ever just discovered things using collections?

Kris Helgen: Yeah. Along with rats like this one, there have been a range of marsupials, and especially bats, including very big bats.

Maggy Benson: I see some big bats here.

Kris Helgen: We have some on the table. These are some of my favorites. This is the new species [00:19:30] of bat sitting on the table that I named not so long ago and it's called the greater monkey faced bat. The skins, these don't necessarily do it justice, but it does have kind of a primate like face and it has a remarkable-

Maggy Benson: It has beautiful fur.

Kris Helgen: It's gorgeous, yeah. It has this thick fur. This species can live in the lowlands up into the mountains. It has a really remarkable skull, too. It has a larger set of jaws and teeth [00:20:00] than any other bat on our planet, including a canine, that's the sharp tooth in your mouth that has sort of two cusps to it. That's unusual in mammals.

Maggy Benson: Huge.

Kris Helgen: So, this thing can break open coconuts, eat rainforest nuts, eat big thick skinned fruits. A remarkable bat.

Maggy Benson: And is this bat still living today?

Kris Helgen: Yeah. This bat is still alive, but it has a designation that we call critically endangered, which means that we're very concerned about its extinction in the immediate future, very near future. [00:20:30] When you think about it, this thing, this bat didn't have its scientific name until recently and by showing people that it exists, giving it its name, starting to study its biology and learn that it's an endangered species, that really is the best first steps towards its conservation.

Maggy Benson: That's a great story. Kris, you've made a very famous discovery, it was very much in the news, the olinguito.

Kris Helgen: Olinguito.

Maggy Benson: And that had another great story about people getting involved in seeing this animal. [00:21:00] Can you tell us about what an olinguito is and how you discovered it?

Kris Helgen: The olinguito is a member of the raccoon family and it's related to animals called olingos, which most people haven't heard about. It was this part of the raccoon family tree that just wasn't well studied, you see a range of olingos in this picture, and I wanted to study variability in olingos to tell whether there was one or more than one species. That led me to all kinds of collections like we've been talking about, natural history collections, and in particular in the Field Museum, I pulled out this drawer [00:21:30] and I saw these gorgeous orange red pelts sitting in this museum cabinet. And I said, "Wow. That is not an olingo. That is no other member of the raccoon family and it's like no other mammal I've ever seen."

Kris Helgen: I looked closely at the skull, the teeth, the bones were different, and I thought, "Could this be some kind of mammal that all other zoologists have overlooked until now?"

Maggy Benson: Did that lead you to a field expedition?

Kris Helgen: Exactly. Here you see this habitat. This is in Ecuador. The [00:22:00] specimens that we found were from Colombia and Ecuador, and some of them were decades old, and we used that information to partner up with one of my colleagues in Ecuador, Dr. Miguel Pinto. He knows the forest very well. He went there ahead of us and he made this film. It's very grainy, but he was out there-

Maggy Benson: In the red circle is that-

Kris Helgen: In the red circle. You have to look closely.

Maggy Benson: ... the olinguito?

Kris Helgen: That was the first clue that it might be out there in the field. It was so exciting. So, even though that doesn't look like much, Miguel saw the animal in the middle of the night jumping from tree [00:22:30] to tree, and that was enough for us to mount an expedition and go there. You might think it would be a needle in a haystack mission. We thought it might be, but the first night we were there, we found the olinguito.

Maggy Benson: How thrilling. You certainly did your work in the museum collections, talking to the local scientists and the experts, and then you find it in the field.

Kris Helgen: That's it. Right. That was a great story for us.

Maggy Benson: And I understand that the local knowledge that has grown around the olinguito has been really special, too.

Kris Helgen: That's been the most special thing about it. [00:23:00] It was only in 2013 that we announced the existence of this animal, giving it its scientific name, showing where it lives, how to tell it apart, and since then, lots of information has been flowing in from people-

Maggy Benson: Like this?

Kris Helgen: Yeah, this. This is a baby olinguito.

Maggy Benson: This is adorable.

Kris Helgen: It is adorable. These are things we didn't know. We didn't know what the baby olinguito looked like, that the mother raises it in a nest. These have been new things that we've learned since we announced the existence of the species. That's been wonderful.

Maggy Benson: Are there any other research projects that you're working [00:23:30] on that connect people to your science?

Kris Helgen: Yeah, a lot of my work does connect to people, and that's one of the most rewarding things for me is doing science that matters to people. And one of the ways that we do that is we can use collections to study diseases. Many diseases are carried by wild mammals.

Maggy Benson: You showed me an example here of Lassa fever in the rodent range here at the Smithsonian.

Kris Helgen: Right.

Maggy Benson: The rodent range was way too big to bring into our studio-

Kris Helgen: It's huge.

Maggy Benson: So, we went out to it, so let's take [00:24:00] our viewers.

Kris Helgen: Okay.

Maggy Benson: Kris, what is the rodent range?

Kris Helgen: It is the largest collection in the world of rodents. We can think of it as the biggest library of rats and mice.

Maggy Benson: Some people really wonder why we keep so many rats and mice.

Kris Helgen: There are so many reasons why we need to study these animals in this way. I'm pulling out one species that we call a multimammate mouse, and this is the skin of it.

Maggy Benson: What is a multimammate mouse?

Kris Helgen: It means many mammary glands.

Maggy Benson: Oh, I see them. So many.

Kris Helgen: [00:24:30] Yeah, so on the belly you can see there's actually 12 pairs of them.

Maggy Benson: So 24.

Kris Helgen: Yeah.

Maggy Benson: Wow, so this mouse must be able to have a lot of babies.

Kris Helgen: Exactly. This thing can have more than 20 babies at a time and it can do it several times a year.

Maggy Benson: What's the importance of studying this particular mouse?

Kris Helgen: Well, multimammate mice are the only known host for an important disease in West Africa called Lassa fever. It's a disease caused by a virus. We call it a viral hemorrhagic fever. It's like Ebola. So, a potentially very [00:25:00] scary disease, and when it was first discovered in West Africa and people were dying, nobody knew where it was to be found, where it lived in nature, and that's very scary.

Kris Helgen: A team of scientists working in the 1970s tested lots of different animals to see if they could find where it was from, and using these specimens from the Smithsonian expeditions, they realized that this virus lives in multimammate mice. That's where it lives in nature.

Maggy Benson: So, they were able to discover that using this collection?

Kris Helgen: Absolutely. [00:25:30] One of the first things we want to know about any disease is its basic biology. Where does it live, where can we find it, and how does it reach people. Something like Ebola is so scary today because we still haven't pinned that down. We haven't figured it out. This disease was just as scary when it was a mystery where it was, but the efforts by Smithsonian scientists using these very collections helped to solve that mystery.

Maggy Benson: That's an incredible story. Thank you so much for sharing it with us today, Kris.

Kris Helgen: Absolutely, Maggy.

Maggy Benson: Kris, [00:26:00] thanks again for helping us understand how museum collections, your mammal research, disease in humans are all interconnected.

Kris Helgen: Of course, Maggy.

Maggy Benson: Miranda has another really great question. She would like to know if science has always been your favorite thing to do.

Kris Helgen: That's a good question. It has always been a deep interest of mine. In particular, I grew up absolutely fascinated with animals. This is a picture of me at three years old.

Maggy Benson: Already with your own collection.

Kris Helgen: Already with [00:26:30] my animals. I loved animals, I loved the outdoors. In addition, the joke in my family, you can see it here, is that I was always sorting them out into different kinds. Well, I'm still doing that today at the Natural History Museum. I was, the horses go with the horses and the zebras with the zebras. But it's true, when I was a child, a question kind of popped into my head and never left, and that question was, "How many kinds of animals are there on the planet? How rich is it? How rich a tapestry is it?" And for me, it was always mammals and I've followed that question [00:27:00] all the way through thinking the answer should be simple, that we might already know, and the more we explore, the more we find.

Maggy Benson: How important were teachers, and mentors, and colleagues on your path to becoming a curator here at the Smithsonian?

Kris Helgen: So important. This is something that none of us can do on our own. We need inspiration, we need guidance, we need teachers to help us find our way there. A big thing for me was as a child, starting to realize that you could be a scientist, that you could be a zoologist, that this was [00:27:30] a job that you could do and that grabbed ahold of my fascination and I wanted to do it from a very early age. But I wouldn't have gotten here without a lot of support from mentors and teachers along the way.

Maggy Benson: Kris, thank you so much for being here. We're unfortunately all out of time, but it was so wonderful to hear a little bit about your work, to learn about some of the new discoveries you made and how important that is for understanding mammal biodiversity and environmental change in the past, and even in the future. Can you tell our viewers where they can learn a little bit more about your work?

Kris Helgen: Of course, [00:28:00] Maggy. A good place to go would be to the International Red List of Endangered Species. That's a place where there's a lot of information

about all mammals on our planet, whether it's the greater monkey faced bat, the olinguito, or anything else.

Maggy Benson: Very cool. Thank you so much again, Kris. And remember, you have a standing invitation for when those new species are announced.

Kris Helgen: I'll be back, Maggy. Thank you very much.

Maggy Benson: Thank you all for joining us for another episode of Smithsonian Science How? If you missed part of this broadcast or want to see it again, it'll [00:28:30] be archived later this evening at qrius.si.edu. Again, thank you so much for tuning in and we'll see you next time on Smithsonian Science How.