

[crickets]

[cymbal plays]

[chime]

[music plays]

[NARRATOR:] The tropical forests of Colombia are home to a myriad of plant and animal species. Like many of the world's forests, this one in the Middle Magdalena Valley is also under threat. As Colombia's human population grows, huge swaths of forest are cleared for farmland and cattle ranches. The remaining patches of forest become fewer and further apart from each other, in a process ecologists call habitat fragmentation. Fragmentation threatens the survival of all animals that live in the forest by reducing the amount of habitat, and converting what's left to patchy, disconnected areas. That is particularly true for the largest primate in the Americas: the brown spider monkey. They rely on trees for their food and shelter. And a continuous forest canopy acts as a highway, providing them the freedom to move.

[LINK:] The situation with brown spider monkeys in Colombia is very, very critical. They have lost more than 80% of their forests.

[NARRATOR:] It's clear that spider monkeys rely on forests to survive, but do the forests also rely on spider monkeys?

[music plays]

[NARRATOR:] Wind, water, or animals can carry seeds from a parent plant to new locations. The seeds of tropical tree species are primarily dispersed by animals that eat fruits.

[LINK:] Many animals eat hundreds and hundreds if not thousands of fruits in a day. Most of them will swallow the seeds and will defecate them in other places, and through this process disperse them in different parts of the forest.

[NARRATOR:] Spider monkeys eat large amounts of fruit to support their size and are likely a major seed disperser in Colombian forests. When seeds simply fall in the forest, they end up near their parent tree. Here, seeds compete with other seeds from the same tree. Their chances of survival are low. But seeds that are carried away by spider monkeys and other dispersers are more likely to survive and grow into a healthy plant. Fragmentation reduces forest regeneration in two ways: it decreases the number of seed dispersers and it limits how far they can safely travel. Andres Link and his colleagues have come to the Middle Magdalena Valley to measure how many seeds spider monkeys are dispersing and from which tree species.

[LINK:] So we started to wonder, ok, what is the role of these primates in the dispersal of seeds of many plant species?

[URBINA MALO:] They help to regenerate the forest and it is very important to know which species are they eating, because in that way we know which species are going to spread and which are not.

[music plays]

[NARRATOR:] The first step is to collect the seeds dispersed by an individual monkey in a day.

[LINK:] What we do literally is to follow them the whole day long.

[music plays]

[leaves crunching]

[music plays]

[LINK:] If we see that they're going to defecate, we pay close attention. But also, normally we hear that some seeds fell that a monkey defecated and you can hear how it sounds when it hits the leaves in the ground. But when we can't find it what we do is we rely on those animals that are specialists in getting to these fecal samples.

[music plays] We just have to stay really still, and in a couple of seconds you'll start hearing some buzzing that increases and increases in sound.

[URBINA MALO:] The dung beetles have a very particular sound. So you will follow the sound, look for the dung beetle and they will be making a little ball from the poop that you want so you just take it!

[music plays]

[LINK:] OK so we have some dung beetles here, collecting the poop, so there must be seeds around. We can find something here. We collect each fecal sample in an individual plastic bag, and we put an individual number to each bag. Because we are interested in quantifying not only seed dispersal of the species, but also the ability of each individual, or the amount of seeds that it can disperse in a single day, or to find differences between males and females, or immature and mature animals. A single spider monkey can defecate probably between 13 and 17 times a day. And this is only one monkey and this will represent hundreds if not thousands of seeds that a single monkey disperses in this forest.

[water flowing]

[NARRATOR:] They clean the seeds they've extracted so they can be further characterized, and cataloged. This works takes place back in their lab in Bogota.

[LINK:] In the Middle Magdalena, these spider monkeys can disperse about a hundred species or maybe more. As we learn about the important role of spider monkeys in dispersing the seeds of many

plants, and at the same time we see how populations are declining, we start to worry a lot about the future of these forests.

[NARRATOR:] With fewer spider monkeys, the forest is less able to regenerate, further decreasing the spider monkeys' habitat. Researchers are trying to break this cycle by replanting the seeds they found. They plant them in deforested areas that are no longer used for agriculture. They will grow into the trees that monkeys need for food and shelter.

[LINK:] So what we do is collect those seeds and we plant them in areas that have been degraded. And especially we plant them in areas that we have identified that can be potential corridors between isolated patches of forests.

[NARRATOR:] Growing these trees in the areas between forest patches, will allow spider monkeys to move from one patch to another, increasing both their chances of survival and their ability to disperse seeds.

[LINK:] We really think this process of restoration and connecting these forests will provide a future scenario that is much nicer, a future scenario in which monkeys will not depend on us to have a viable population going on there and surviving without the need of our assistance.

[music plays]