

# New study aims to help preserve plants, animals caught between forest 'fragments'

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Maintaining the world's threatened animal and plant species may rest with something as simple as knowing how far a bird can fly before it must answer nature's call.

Birds disperse seeds as they travel, but deforestation can mean those seeds might land where they can't sprout and grow, according to a University of Florida [researcher](#) who co-wrote a study in last month's issue of *Ecology* that looks at how tropical birds disperse plant seeds in Brazil's [Amazon rainforest](#).

If birds spread plant seeds in inhospitable places, the long-term consequences can be reduced [diversity](#) in large tracts of the Amazon, said Emilio Bruna, an associate professor in wildlife ecology and conservation. And that could be bad news for scientists trying to study and conserve species in the most biodiversity-rich land mass on [Earth](#).

The work took a comprehensive approach to the question of where seeds are dispersed — not only tracking plants, recording bird flight patterns and studying their behavior, but incorporating their observations in sophisticated mathematical models and computer simulations.

Bruna, who holds joint appointments in UF's Institute of Food and Agricultural Sciences and Center for Latin American Studies, worked with scientists from Columbia University, Louisiana State University and Brazil's National Institute for Amazonian Research.

The idea behind the National Science Foundation-funded study was to look at seed dispersal in parts of the rainforest where deforestation has left pockets of undisturbed land, called "fragments."

Human activity, such as logging or housing development or farming, leaves those fragments behind, sometimes close together; sometimes not.

Ensuring the survival of plants and animals that live in those fragmented areas, and finding ways to connect those fragments, is a big focus for conservation biologists, Bruna said.

"Understanding the consequences of habitat fragmentation is a huge area of research because that's what a lot of ecosystems have come to — either that's all we're left with, or we're heading in that direction," he said. "It's a really pressing problem across the world."

The study began with researchers trapping six species of [tropical birds](#) in mist nets and equipping them with radio transmitters, so that they could follow individual birds' movements.

Before that, however, researchers fed the birds seeds from native plants and monitored their digestive habits, using the data to build statistical models that, combined with information from the radio transmitters, let them estimate how far the birds flew before dropping seeds.

Researchers were surprised to learn that only one of the six species, *Turdus albicollis* — the largest of the birds they studied — actually ingested the seeds. That species also flew farther than any of the other birds.

"A lot of ecology has focused on the movement of birds," said Maria Uriarte, a professor in ecology, evolution and environmental biology at Columbia University, and the paper's lead author. "We found that it's all

about the big birds and where they like to be."

The other birds would eat, fly to a nearby tree branch, chew the seed for a bit and usually spit it out.

The seed in question belonged to a plant called *Heliconia acuminata*. The scientists chose it because it grows low to the ground, is easy to work with and easily identified. The plant has no common name, but casual observers would probably liken it to a Bird of Paradise, he said.

If the *Heliconia acuminata*'s seed is dropped by a bird between forest fragments, he said, the seed more than likely will bake in the heat, and no plant will grow. Long-distance dispersal is critical for plants to establish new populations.

The take-home message for scientists and conservationists is that if forest fragments are so far apart that the animals and plants can't make the trip, humans may have to lend a helping hand.

It may be that some type of stepping-stone vegetation is needed between fragments, so that [birds](#) and animals have places to rest as they move from one to another. Or maybe humans need to leave forested corridors between those fragments to connect them, Bruna said.

"This study really highlights the importance of, the word that's used a lot is 'connectivity' — figuring out ways we can maintain fragments of habitat and keep them connected to each other."

Provided by University of Florida

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