Some forest birds can survive in agricultural countryside with limited habitat conservation

May 24 2007

Some tropical forest birds can survive alongside humans if given a helping hand, according to a recent study by Cagan H. Sekercioglu, senior scientist at the Stanford University Center for Conservation Biology.

The results, published in the April 2007 issue of the journal *Conservation Biology*, could influence the way countries approach endangered species protection in agricultural areas, Sekercioglu said. "Even modest restoration efforts can increase their land cover and help some forest birds more than you would think," he said.

The study was conducted in Costa Rica at the Las Cruces Biological Station of the Organization for Tropical Studies, where most of the forested terrain has been converted to open coffee plantations or pasture-unfavorable habitats for birds, according to Sekercioglu. In previous studies, researchers had identified nearly 200 bird species in coffee plantations by simply capturing or observing them there. "If you do that, you might think, 'Well, these birds are doing fine in coffee plantations," Sekercioglu said.

However, he felt that simply seeing the birds in coffee plantations was not sufficient evidence to conclude that they had adapted to life outside their native habitat. Sekercioglu wanted to follow the birds more closely. He and his team set up a comprehensive bird-banding and radio-tracking system to monitor the birds' positions throughout the day.

First, they hung mist nets in various places in the coffee plantations to catch a large sample size of birds of three particular species. Then, they tagged each bird with two colored leg bands and an aluminum ring with an identification number. Using false-eyelash glue, they attached a radio-transmitter with a battery life of one-to-three months. The team tagged and tracked a total of 156 birds during the study.

"We had a Pathfinder packed with 10 people and gear," he recalled. "A couple times we had people hanging onto the outside. It's lot of fun."

The researchers encountered a few surprises during the study. One assistant tracked a slow-moving radio signal to the forest floor, a strange occurrence since most of the bird species prefer tree branches. As the signal became louder, the researcher suddenly realized it was coming from a bushmaster, the deadliest snake in Latin America. The 15-foot snake had eaten both the bird and its radio. "It just started slithering away and the signal faded," Sekercioglu said.

Every day, each team member would be assigned to track from one to six birds. They generally worked from dawn to dusk. "We start before the birds are awake and moving," Sekercioglu said. "We leave the station at 4:30 a.m."

The researchers recorded every bird's information in a database, including its species, band number and the number of daily sightings. The team tried to record at least 50 to 100 sightings for each of the 156 birds scattered across a period of at least 10 days, Sekercioglu said.

After eight months of tracking over two seasons, the team concluded that many tropical forest birds tend to avoid coffee plantations, even though they were frequently observed there by researchers in previous studies. "When you radio-track birds, you realize many go through coffee because they have to," Sekercioglu said. "Seeing them in coffee

does not necessarily mean they like it there."

Because the coffee plant is not native to Costa Rica, local birds have not evolved to eat the fruit or to live among the open fields of the plantations, he said. "Although we caught all these birds in coffee, most of them prefer remnant forest fragments, individual trees and trees along rivers, which are called riparian corridors." He added, "Most birds don't like to eat the coffee fruit. Caffeine evolved as a pesticide to keep pests away."

The team compared percentages of land-cover type in the area to the birds' preferred locations. "Remnant trees-individual trees-only covered 1.4 percent of the landscape, but some of the birds spent 25 to 30 percent of their time in these few trees," Sekercioglu explained. Similarly, some birds spent up to half their time in riparian corridors, which cover only 4.6 percent of the area.

"These small patches of trees are critical for these native birds," Sekercioglu said.

Sekercioglu is optimistic about the implications of his findings for endangered bird species. "Even modest restoration efforts to increase tree land cover can help these birds more than you would think," he said.

Furthermore, the research demonstrated the ability of some tropical forest birds to survive in human-dominated agricultural countryside. "That's good news," Sekercioglu said. "Even though they didn't spend a lot of time in coffee plants themselves, they did fine in a coffee-dominated landscape, as long as there were some trees around."

These findings suggest that humans and birds may be able to successfully coexist if farmers leave small reserves of forest, riparian strips or single trees interspersed throughout agricultural land, Sekercioglu said. "Even

though we would like to have big national parks with a lot of forest, sometimes when you can't have that, when you have to have agriculture, it's really important to have these reserves of native trees and native forests, which can support large numbers of native birds and other organisms," he added.

Sekercioglu's recommendations are helping to shape a Las Cruces project encouraging local people to plant native trees around their farms and villages, and Sekercioglu and his colleagues are planning a workshop at Las Cruces on restoration ecology. "It's starting to have an impact, so that's exciting," he said.

In addition to banding and tracking birds, the research team monitored over 300 nests. Also, they have collected more than 10,000 feather samples to determine the protein content in birds' diets and have taken nearly 2,000 blood samples for genetic analyses and to study avian malaria, Sekercioglu said.

"The more we learn, the more we realize we don't know," he said. "That's why you need a multi-pronged approach to look at birds' habits from every level."

Source: Stanford University