Study helps quantify biodiversity decrease around farmland

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Animal biodiversity suffers near conservation areas that border big farms, and the effects can spread for miles, according to a new study by University of Florida researchers and their colleagues.

Maintaining animal biodiversity is important as it can lead to greater control of agricultural pests and increased pollination around farmland as well as help maintain the health of an area's ecosystem, said Robert McCleery, a study co-author.

The researchers studied small mammal populations across large-scale sugarcane production areas and adjacent to isolated pockets of conservation land in Swaziland, Africa. The study was published Monday in the online journal *PLOS ONE*.

When analyzing small mammal populations 700 feet into the sugarcane, the researchers found that species diversity declined, leaving mainly generalist species that can thrive in a wide variety of conditions and are sometimes pests.

"It went from a diverse suite of eight or nine species to two generalist species that were very abundant," said McCleery, an assistant professor in UF's wildlife ecology and conservation department, part of UF's Institute of Food and Agricultural Sciences.

"You lost species, gained no species and had a huge biomass of pest species. And this goes on for miles and miles."

Here in the U.S., there are government programs to encourage private landowners to set aside agricultural land for conservation, McCleery said.

"From my perspective, the real problems are in the developing world where there is a rapid increase in intensive agriculture, and there aren't government programs that consider conservation measures," he said.

McCleery said loss of cover, decreased diversity of food resources and agricultural practices, such as flooding the sugarcane, might have played a role in diminishing the populations of the specialist species they studied in Swaziland.

The researchers also measured small mammal populations as they extended from the sugarcane and into the conservation area.

"There weren't all that many negative impacts from the agriculture into the interior of the conservation area, and we saw that as a good thing," McCleery said.

The researcher said implementing different land uses into the landscape, such as perhaps cattle ranching, or incorporating natural habitat corridors connecting the conservation areas could be ways to reduce pest species around the farmland and maintain species diversity.

"If we want to make our isolated protected areas viable, we need to encourage the flow of animals in between them," McCleery said. "We know that a continuous monoculture is not making that possible. So there need to be some different land uses and ways to connect them."

Provided by University of Florida