Wildlife corridors sometimes help invasive species spread, research finds

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When the ants come marching in, having miles of linked habitats may not be such a good idea after all.

In a classic example of the law of unintended consequences, new University of Florida research suggests that wildlife corridors – strips of natural land created to reconnect habitats separated by agriculture or human activities—can sometimes encourage the spread of invasive species such as one type of fire ant.

The findings are particularly important in Florida, where invasive species are a vexing problem. The Sunshine State plays host to animals such as Cuban tree frogs, green iguanas and feral hogs. In 2013, the Florida Fish and Wildlife Conservation Commission even sponsored a Burmese python hunting challenge.

The discovery also comes as a team of explorers prepares to embark this fall on its second 1,000-mile expedition to raise support for the Florida Wildlife Corridor. The organization's goal is to create a corridor stretching from Everglades National Park to the Okefenokee National Wildlife Refuge in Georgia.

Could corridors be used by invasive species to spread across conservation lands? Sometimes, according to research by Julian Resasco, who led a study of red imported fire ants while he was a doctoral student in biology at UF. Resasco and his colleagues found that one type of fire ant used wildlife corridors to dominate recently created landscapes.

Resasco's paper is published in the August issue of *Ecology*.

"Although habitat corridors are usually beneficial, they occasionally have negative effects," he said. "Sometimes they can help invasive species spread in exactly the same way they help native species."

The challenge for ecologists is to figure out when invasive species are likely to benefit from corridors. Resasco's results initially surprised the researchers because invasive species are usually talented in their ability to invade new areas—they shouldn't need corridors to get around. Fire ants turned out to be an exception that proves the rule.

They have two social forms: monogyne and polygyne. Monogyne fire ants fly high in the air to mate and disperse, raining down to create new colonies. Polygyne fire ants, on the other hand, mate low to the ground and sometimes crawl short distances to create new colonies. They don't spread widely and their colonies are dense.

Resasco and his team went to South Carolina to study eight sections of land, each dominated by one of the two social forms. Each section consisted of five patches of regenerating habitat. Each patch was about the size of a football field. Some were connected by a corridor and others were not, allowing the researchers to study the influence of corridors.

The researchers found that corridors significantly increased the abundance of polygyne—but not monogyne—fire ants. In polygyne sections, native ant species' diversity was lower in patches connected by corridors than in unconnected patches. That was most likely due to the higher fire ant abundance, according to the study.

Ultimately, Resasco said, whether corridors spread invasive species depends on dispersal ability: "It is not a coincidence that the readily

dispersing monogyne form of fire ants doesn't benefit from corridors, whereas the poorly dispersing polygyne form does." For better or worse, poorly dispersing invasive species are exceptional.

More analysis is necessary to determine whether the effects of corridors on invasive species are transient or permanent. In the meantime, Resasco's paper urges land managers to consider animals' traits when making decisions about land corridors. In rare cases, their best intentions could backfire by aiding invasive species.

Provided by University of Florida