

Things Looked Bleak Until These Birds Rapidly Evolved Bigger Beaks

By DOUGLAS QUENQUA NOV. 28, 2017



A North American snail kite in Florida. Researchers say the bird species has rapidly evolved larger beaks and bodies to eat a larger, invasive snail.

Credit Robert Fletcher/University of Florida

Conservationists have been sounding the alarm over invasive species for years, warning of the damage they can cause to habitats and native animals. But in Florida, an invasive snail might be helping an endangered bird species come back from the brink, researchers say.

The population of North American snail kites — birds that use curved beaks and long claws to dine on small apple snails in the Florida Everglades — had been dwindling for years, from 3,500 in 2000 to just 700 in 2007. Things began to look particularly bleak in 2004, when a portion of the Everglades was invaded by a species of larger snail that the birds had historically struggled to eat. Ornithologists assumed the shift would hasten the snail kite's decline.

But the number of snail kites in the Everglades grew over the decade following the invasion of the larger snails. The reason, according to a study published Monday in *Nature Ecology and Evolution*, is that the snail kites have rapidly evolved larger beaks and bodies to handle the bulkier snails.



The invasive snails are two to five times larger than the native species, and young kites with larger bills that were able to feed on them were more likely to survive their first year.

Credit Robert Fletcher/University of Florida

“We were very surprised,” said Robert Fletcher, Jr., an ecologist at the University of Florida and an author of the study. “We often assume these large-bodied animals can’t keep up with changes to the system, like invasions or climate change, because their generation times are too long. And yet we are seeing this incredibly rapid change in beak size of this bird.”

Dr. Fletcher and his colleagues analyzed 11 years of morphological data they had collected on the birds. Because snail kites can live to the relatively old age of 8, that time period represented fewer than two generations for the birds. Nonetheless, the researchers found that beak and body sizes had grown substantially (about 8 percent on average, and up to 12 percent) in the years since the invasion. Exactly how the birds are pulling off this evolutionary trick is not clear, but natural selection does appear to play a part. Young snail kites with larger bills were more likely to survive their first year than snail kites with smaller bills, presumably because the large-billed birds were better able to eat the invasive snails.

Young birds eating the invasive snails, which are two to five times larger than the native ones, were also growing faster than birds weaned on the smaller ones, which may account for the increase in overall body size.

But the researchers found suggestions of a genetic component to the changes, as well. By tracking the birds’ pedigrees, they found that large-beaked parents gave birth to large-beaked offspring, setting the stage for large-scale evolutionary change.

Thirteen years after the larger snails invaded, the population of the birds has nearly tripled, to “well over 2,000,” Dr. Fletcher said. “It’s been a major development for the recovery of this species.” Outside of Florida, related snail kites are found in parts of South America, Central America and the Caribbean, where they are not considered endangered.

Overall, the findings are good news for animals squaring off against invasive species or other rapid habitat change, including global warming. “This work illustrates very clearly that these large top predators can respond to invasions at a rate much quicker than most people have ever imagined,” Dr. Fletcher said.