

# Hots dogs, chicken wings and city living helped wetland wood storks thrive

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Stork chicks in a nest in South Florida eating a chicken wing. Credit: Betsy Evans, Ph.D.

Natural wetlands continue to disappear due to city and human development and are being replaced with manmade swales, ponds and

canals. This degradation and replacement of natural wetlands suggest that urban areas may be imperative to wetland species, especially when natural conditions are unpredictable. Wetland birds are often seen in and around cities; however, they have been largely ignored in urban wildlife studies. In their historic ranges, wetland birds inhabit dynamic marshes, traveling long distances to locate food. Yet, does their ability to forage for food in natural environments translate to their ability to do so in an urban environment?

Using the Wood Stork (*Mycteria americana*), a large American wading bird found throughout southeastern swamps and wetlands, scientists from Florida Atlantic University's Charles E. Schmidt College of Science compared city storks with natural wetland storks to gauge their success in [urban environments](#) based on their diet and [food](#) opportunities.

Results of the study, published in *Scientific Reports*, provide evidence and a systematic understanding of how a wetland species persists and even thrives in an urban environment, by switching to human foods like chicken wings and hot dogs when natural marshes are in bad shape.

For the study, researchers sampled 160 nests during the 2015-2017 nesting seasons. Of the 160 sampled nests, 106 nests were in three urban colonies and 54 nests were in two natural wetland colonies in South Florida where a vast freshwater wetland, the Everglades, is located adjacent to a large urban area. They compared urban and natural wetland storks' productivity, body condition, reproductive performance, breadth of diet, and tested whether stork diets changed during suboptimal natural wetland conditions.



An urban colony of storks in South Florida. Credit: Betsy Evans, Ph.D.

They found that storks were able to exploit [urban areas](#) when natural food resources were scarce. This ability to switch between habitats and thus resources allowed for better reproductive performance during periods of low natural food availability. Furthermore, body condition did not differ significantly between urban and natural wetland nesting birds during either optimal or suboptimal conditions, suggesting that supplemental environmental resources do not negatively impact body condition. These findings indicate that urban areas can buffer a species from the unpredictability of natural food resources.

"During suboptimal conditions, urban birds expanded their diets to include more prey types, including anthropogenic food, suggesting that

urban birds were able to exploit urban areas during low natural wetland prey availability," said Betsy A. Evans, Ph.D., a natural resources specialist with the United States Army Corps of Engineers and lead author, who conducted the study as a graduate student in FAU's Department of Biological Sciences with co-author Dale E. Gawlik, Ph.D., a professor in biology and FAU's Environmental Science Program. "The ability of urban birds to switch their diet to include different prey types such as human-provided food that included chicken wings and hot dogs likely allowed them to produce more chicks during poor natural wetland prey availability conditions than their non-urban counterparts."

Evans and Gawlik discovered that not only were urban storks able to access human-provided food such as trash, but they also increased the proportion of amphibians such as frogs in their diet when natural wetland conditions were suboptimal. Larval frogs (tadpoles) occur in a wide range of wetland types in the study region; however, they were 10 times more abundant in roadside created wetlands such as swales, ponds and canals than in natural wetlands during the time-period of this study. This suggests that storks may also have been accessing created wetlands along roadways during suboptimal natural wetland conditions.

"Behavioral flexibility and the ability to travel long distances and exploit resources in dynamic systems may give [wetland birds](#) an ecological advantage in urban environments," said Gawlik. "Our findings demonstrated that urban storks expanded their diets during times of low natural wetland prey availability to include resources commonly found in urban areas, partially dampening the natural wetland food limitation on wading bird populations. Natural wetland [birds](#), however, paid a greater reproductive penalty during suboptimal conditions than their urban counterparts. Furthermore, this ability to switch diets between resource pulses may reduce population fluctuations and lower the risk of extinction."

The study demonstrates that urban environments may support biodiversity in a variety of ways. To mitigate potential threats from urbanization it will be important to understand how species exploit new resources as well as how they are affected by loss of resources from human activities.

For the study, the researchers visited two natural wetland colonies and three urban colonies one to two times per week during the 2015-2017 breeding seasons (approximately March through June). They selected these study colonies based on their range of hydrological conditions and history of repeated use by nesting storks. They describe colony landscape type broadly as either "urban" or "natural wetland" with natural wetland colonies occurring within Everglades National Park and urban colonies occurring within the urban east coast corridor of South Florida. At each colony location, they marked individual nests from which they collected productivity, body condition, and diet information.

**More information:** Betsy A. Evans et al, Urban food subsidies reduce natural food limitations and reproductive costs for a wetland bird, *Scientific Reports* (2020). [DOI: 10.1038/s41598-020-70934-x](https://doi.org/10.1038/s41598-020-70934-x)

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