Just how far will American urban sprawl spread?

By Dave Levitan

We have been hearing for a while now about the continued explosive growth of cities around the world. According to the World Health Organization, [40% of the global population](http://www.who.int/gho/urban_health/situation_trends/urban_population_growth_text/en/) lived in an urban area in 1990, we crossed the 50% threshold by 2010, and we’ll be at 60% by 2030 and 70% by 2050. That means more cities, bigger cities, and, importantly but often forgotten, more sprawl.

“Urban sprawl increases the connectivity among urban habitats while simultaneously fragmenting non-urban habitats such as forests and grasslands,” write researchers in a [new PLoS One paper](http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0102261). “These changes have a variety of effects on species and ecosystems, including impacts to water pollution, disturbance dynamics, local climate, and predator-prey relationships.”

1. What is an environmental impact of urban sprawl?

The researchers, from the US Geological Survey and North Carolina State University, modeled how urban sprawl—defined as low-density development outside the “urban core”—is going to change in the American Southeast over the next few decades to see how ecosystems in that area may change as well.

They found that sprawl is expanding in a big, big way. Overall, the simulations pointed to an expansion of “urbanisation” in the Southeast by between 101 and 192% over the next 50 years. The median number was 139%, representing an overall expansion of 90,700 square kilometers (around 35,000 square miles); that’s bigger than the entire area of one southeastern state, South Carolina.

The specific types of land that end up as urban sprawl, of course, matter greatly as to how the expansion affects habitats. The paper found that the largest conversion will be from agricultural land to urban uses, with up to 21% of farmland yielding to the cities’ tentacles. Grasslands (up to 17%) and forests (up to 12%) are next, followed by wetlands (up to 7%).

“The increasingly fragmented natural landscape would reduce habitat availability, suppress natural disturbance processes (such as wildfires), hinder management actions that come into conflict with urban areas, and likely eliminate existing corridors,” the authors write. “Furthermore, all these impacts could occur simultaneously, posing a particularly devastating threat to already vulnerable species and systems.” They note the endangered [red-cockaded woodpecker](http://www.fws.gov/rcwrecovery/) as an example; it lives in longleaf pine forests, which will likely be among the forest casualties in this new urban wasteland.

And there are secondary effects to simply eliminating forests and grasslands where animals live. The urban heat island effect (and all its attendant causes, effects, and [cause-effect mishmashes](http://conservationmagazine.org/2014/07/vicious-cycle-air-conditioning-is-making-your-city-even-hotter/)) will expand its reach, for example raising temperatures in the Piedmont region by between 2-6C. And while sprawl destroys some wildlife corridors, it will open up other, weirder ones: the simulation suggests that some currently disconnected urban environments will expand enough to join forces. Creation of “urban corridors” could create novel habitats that allow totally different groups of species to flourish; one giant megalopolis will exist, unbroken, all the way from Raleigh, North Carolina, to Atlanta, Georgia, 400 miles distant.

Group Work

Use notes from the textbook and your brain to brainstorm answers to the following questions:

1. What are the causes of the urban sprawl?
2. How could urban sprawl affect human health?
3. What do you believe are the two most important smart growth strategies to reduce urban sprawl?
4. How can local governments encourage smart growth?
5. The article talks about loss of agricultural land as a result of urban sprawl. How could we increase food production in cities?