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## How Big Does A Prairie Need To Be?

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BOX CAR  
*Phil Epp*

## HOW BIG DOES A PRAIRIE NEED TO BE?

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The Nature Conservancy ecologist Chris Helzer asked how big a prairie needs to be in order to maintain ecological functions or, on the flip side, how much habitat fragmentation—breaking up of landscapes into smaller, unconnected, and dissimilar patches — undermines a prairie. Finding answers to such questions is important so we can more effectively conserve natural landscapes like the Flint Hills.

The Flint Hills were once part of a vast tallgrass prairie ecosystem. Many species depended upon the wide-open spaces that the prairie offered. Fire was the primary driver that created this openness, and today fire helps maintain it. Lightning caused many of these fires, but native peoples may have been an even more significant ignition source.

Native Americans who lived here were well aware that the apparent desolation after a burn soon transformed into luxuriant forage, which in turn attracted bison and other grazers from afar. In contrast, settlers generally saw prairie fires as a threat. One historic account that involved my great-great-grandparents conveys this sentiment. Below is an excerpt from the story, published a century later in *Kanhistique* by my great-great-aunt, Elsie Shippy:

*One prairie fire that seemed to have impressed her [Elsie's mother] more than any other happened in April of 1874. About ten o'clock that morning my grandmother went to get water at the spring below the old oak tree on the bank of Lyons Creek.*

*She saw a brownish copper colored cloud rolling rapidly in from the southwest. Terrified she ran to call my grandfather. He had already seen the terrifying spectacle and was coming from behind the crude pole barn with horses hitched to the walking plow. Immediately he began to plow a furrow around the log house and pole barn. The dust and smoke blinded grandfather so that he could hardly see; yet he kept right on plowing.*

As we see here, plowing was not just to create a seedbed for raising crops, but also to protect against prairie fires. The large sweep of prairie that extended southwest of my grandparents' farm in Dickinson County, Kansas, and that fueled the fire of 1874 was plowed under in just a few years. Within a decade or two much of the tallgrass prairie across the Midwest met the same fate.

The underlying limestone and chert of the Flint Hills largely repelled the plow, thus preserving North America's largest and most intact tallgrass prairie remnant. However, some areas of the

Flint Hills, especially along its outer boundary, have become increasingly fragmented by woody and human encroachment and are no longer able to support viable populations of certain grassland wildlife.

Habitat suitability for grassland species declines at a greater rate when fragmented than from the actual loss of habitat. The proportion of prairie to non-grassland edges, habitat patch size, proximity to other prairie remnants, and the type and extent of fragmentation can all affect grassland wildlife. Something as seemingly benign as a road can impede animal movement and provide an avenue for predators and invasives. Trees, along with human intrusions like roads, pump jacks, power lines, and wind turbines, can also cause wildlife to avoid otherwise suitable habitat. Grassland birds are particularly sensitive to such intrusions due to their hard-wired preference for wide-open spaces.

One of these, the Greater Prairie-



PASSING BY  
*Risk Hazekamp*

Chicken, is often studied and used to prioritize habitat for prairie conservation because of its broad habitat needs, area size requirements, and sensitivity to fragmentation. It is referred to as an umbrella species because its preservation can indirectly benefit other species, from other birds to butterflies and bees.

Besides its effect on native wildlife, habitat fragmentation may have less obvious impacts. For example, some speculate that tree-encroached prairies favor the European honeybee,

but to the possible detriment of some of the hundreds of native bee species that are important pollinators of prairie plants.

A question related to prairie size and fragmentation is whether to concentrate conservation efforts on one or two large blocks of habitat in the core of the landscape or several smaller tracts.

Conserving many smaller parcels across a landscape will typically harbor more species than a single property of the same total acreage, but the likelihood of species disappearing over time will



PURITY  
*Justin Marable*

be greater if adjacent, unprotected areas become less habitable for wildlife. Small protected areas will also likely be less suitable for species like prairie-chickens, which require tens of thousands of acres of relatively contiguous habitat to sustain them over the long haul. Traditionally, this debate focused on where to establish formal reserves to protect wildlife and natural resources. Today, other tools like conservation easements can help

protect against habitat fragmentation while preserving traditional land uses and private ownership.

Ideally, we need to conserve a landscape of prairie in order to sustain over time the majority of species that rely on the Flint Hills. Maintaining the landscape's north-south corridor of prairie will especially be important for migratory species and to mitigate the effects of climate change.

Fortunately, we have the opportunity to prevent additional fragmentation of this last landscape of tallgrass prairie and to maintain it for future generations through the use of conservation easements and the continued practices of prescribed burning, sustainable grazing by ranchers, and a commitment by landowners to conserve this tallgrass treasure. So, to answer the question of how big do prairies need to be, a

variation of a Kansas tourism quip may sum it up best: "bigger than you think"!

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*For more on this topic, see blog at [prairieecologist.com](http://prairieecologist.com)*

*Brian Obermeyer has led The Nature Conservancy's Flint Hills Initiative for the past fifteen years. In addition to private lands conservation work in the region, Brian oversees stewardship activities at the Tallgrass Prairie National Preserve and the Conservancy's Flint Hills Tallgrass Prairie Preserve.*