

To Bloom Again: Can Prairie Restoration Overcome Habitat Loss?

by Meredith Zettlemoyer & Nicholas Srodes

Prairie once covered millions of acres across the Midwest, but now only fragmented patches remain. In fact, Michigan hosts only 0.1 percent of its historical prairie acreage. Why this wipe-out? Prairies have nutrient-rich soils and deep-rooted plants that retain water – a recipe for successful croplands. Prairie loss to agricultural conversion, suburban development, and inadequate management spills over to affect pollinators, birds, and wildflowers.

Kalamazoo County's story is no different. Before settlement, the county boasted 21,576 acres of prairie habitat. Using Geospatial Information Systems (GIS), Nicholas Srodes, an undergraduate at Michigan State University, determined that only 130 acres of remnant (historically occurring) prairie remained in 2004 (Fig. 1). That's 0.006% - if your bedspread was all the prairie that once existed here, only a patch the size of a dime would be left.

That estimate helps scientists predict how many species should be supported in a particular region. Srodes used a classic ecological theory, the species-area relationship (SAR), to estimate how many prairie species should be left based on the remaining habitat. The SAR predicts that the number of species should increase with land area – and on the flip side, that species losses should be proportional to habitat loss. According to this model, Kalamazoo County should only have three prairie species left.

However, thanks to intense efforts by conservation groups, land managers, and scientists to restore 5,113.5 acres of prairie habitat, Kalamazoo still hosts 141 native prairie plant species. In a prairie

restoration, land stewards and scientists try to bring back the historical biodiversity and function of a prairie, whose native grasses provide a home to a variety of wildlife. Even species that disappeared over the last several decades have started to make a comeback in some of these restored prairies. In 29 restored prairies throughout southwestern Michigan, researchers introduced 8 prairie species that haven't been recorded in naturally-occurring populations in Kalamazoo County since the 1940s. Three of those species – compass plant (*Silphium laciniatum*), prairie dock (*S. terebinthinaceum*), and purple coneflower (*Echinacea purpurea*) – have successfully established in sites across the region following reintroduction.

Unfortunately, this isn't enough. We might have more than 3 prairie species on 130 acres, but the SAR predicts 5,114 acres of restored prairie habitat should support 164 species. Why, then, do only 141 persist? Meredith Zettlemoyer, a graduate student at Michigan State University's Kellogg Biological Station, is conducting experiments to test what other factors might

have impacted species losses in Kalamazoo County by reestablishing populations of extinct species like the Mexican hat coneflower (*Ratibida columnifera*), slender mountain mint (*Pycnanthemum tenuifolium*), and pale beardtongue (*Penstemon pallidus*). For example, remnant and restored prairies are often surrounded by agricultural land, so one likely threat is increasing levels of nitrogen fertilization. If we can determine threats to local prairie species and learn to manage them, restored prairies may offer a way to reintroduce these wildflowers into our prairie communities.

Meredith Zettlemoyer is a participant in the NRCS Earth Team Volunteer program.

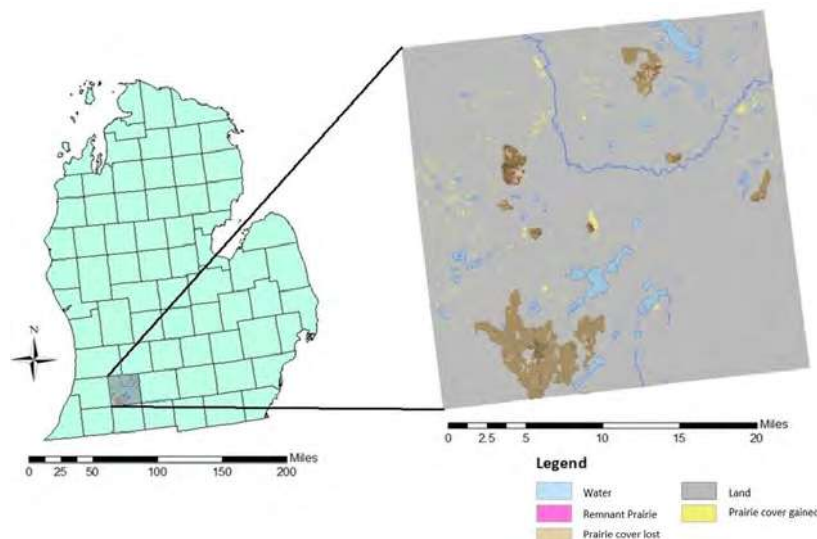


Fig. 1. Kalamazoo County, in southwestern MI, once provided more than 21,000 acres of prairie habitat for native grasses, wildflowers, birds, and insects. Today, only 130 acres of prairie remnant remain (prairie cover lost is shown in brown), although restored prairie (yellow) provides hope for this threatened habitat and its residents.