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Restoration, reconciliation, and reconnecting with nature nearby

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ABSTRACT

Biotic homogenization is in many ways a function of spatial and temporal scale. Another aspect of this phenomenon that perhaps receives somewhat less attention is related to "the scale of human experience", particularly in the way that people view homogenization. Here, I examine the relationship between scale and efforts to reverse the loss of native species using two case studies in the Midwestern U.S. Both of these are focused on the restoration of prairie, one in a rapidly urbanizing area and one in a rural context. At a large reserve in a rural area, it is possible to restore prairie at a scale that is sufficient to accommodate populations of grassland obligate birds. This is an unrealistic goal, however, for small reserves in the midst of suburban development and rapidly escalating land prices. Small reserves in this context may be suitable for taxa with smaller habitat requirements, but also have a vital role in reversing biotic homogenization by enabling people to experience nature directly. Not only does this improve their quality of life, but may also foster support for efforts to maintain biodiversity in more remote locations. Thus, the goals of conservation and ecological restoration at various points on the land-use gradient are somewhat different but complementary and inter-related. Conservation scientists have an obvious role in the restoration and management of large reserves, but they also have an important part to play in restoring and maintaining elements of biodiversity in cities and suburbs.

1. Introduction

Biotic homogenization is in many ways a function of scale. As native habitats are replaced by agriculture or urban development, biodiversity is reduced regionally (and ultimately at global scales) as a relatively small number of species that thrive in human-dominated landscapes replace those that do not (McKinney and Lockwood, 1999). Spatial patterns of species replacement can be viewed as the product of a temporal sequence in which extirpation due to habitat loss is followed by range expansion due to habitat gain (McKinney and Lockwood, 2001), although these two phases often overlap. Locally, there may be a temporary increase in diversity as human-adapted species are added to the existing biota. Species loss may be forestalled depending on the pace of habitat conversion, colonization rates of human commensals, and the length of time that "sink" species can persist once their source habitats have disappeared (Pulliam, 1988; Tilman et al., 1994; Rosenzweig, 1995).

Temporal scale also affects public perception of biotic homogenization Kahn (2002) observed that environmental conditions encountered during childhood form the baseline

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against which people measure environmental degradation later in life and termed this phenomenon "environmental generational amnesia". Thus, the extent of biodiversity loss that is recognized and appreciated by the general public is lessened every few decades.

In this paper, I examine the relationship between scale and efforts to mitigate biotic homogenization resulting from human settlement. I consider spatial and temporal scale, the "scale of human experience" (Karasov, 1997), and two key strategies for reducing or reversing homogenization. The first is habitat restoration and the second is reconciliation (Rosenzweig, 2003), or the purposeful design of human land use to meet the needs of native species. To illustrate my points, I draw on two case studies in the Midwestern United States, one in a rapidly urbanizing area and, for purposes of comparison, the other in a more sparsely populated rural setting.

2. Case studies

The first wave of biotic homogenization in the upper Midwest was initiated in the mid-1800s with European settlement and the conversion of prairie to agriculture. One hundred years later, this was followed by a second wave during which rotation-based cropping systems were converted to row-crop monocultures (Jackson, 2002). The end result was the replacement of a diverse grassland mosaic by monotonous expanses of corn and soybeans. In Iowa, native prairie that once covered 85% of the state has been reduced to 0.1% and the native grasslands that once occupied 60% of Illinois have been reduced to 0.04% (Knopf, 1994; Robertson et al., 1997).

Although the prairie had nearly vanished by the dawn of the twentieth century, the form of agriculture that initially replaced it still maintained important processes and elements of the prairie ecosystem (Jackson, 2002). Extensive hayfields, for example, continued to provide habitat for many grassland birds. Circumstances have changed since the second plowdown and the shift to landscapes dominated solely by annual crops, and during the latter half of the twentieth century grassland birds have experienced greater declines than any other avian group in North America (Peterjohn and Sauer, 1993).

Both of the case studies discussed below involve attempts to restore prairie to landscapes that have been greatly transformed since settlement. My colleagues and I are conducting research at both locations to evaluate these efforts in terms of providing habitat for avian species that are grassland obligates.

2.1. *Broken Kettle Grasslands Preserve*

The largest contiguous prairie in the state of Iowa is located in Plymouth County at the northern terminus of the Loess Hills (Fig. 1). Broken Kettle Grasslands Preserve comprises >1200 ha in the northwest part of the state and is owned and managed by The Nature Conservancy. Broken Kettle is bordered by the 340 ha Five Ridge Prairie Park, originally purchased by The Nature Conservancy in the early 1980s and later ceded to Plymouth County. An additional 650 ha of private

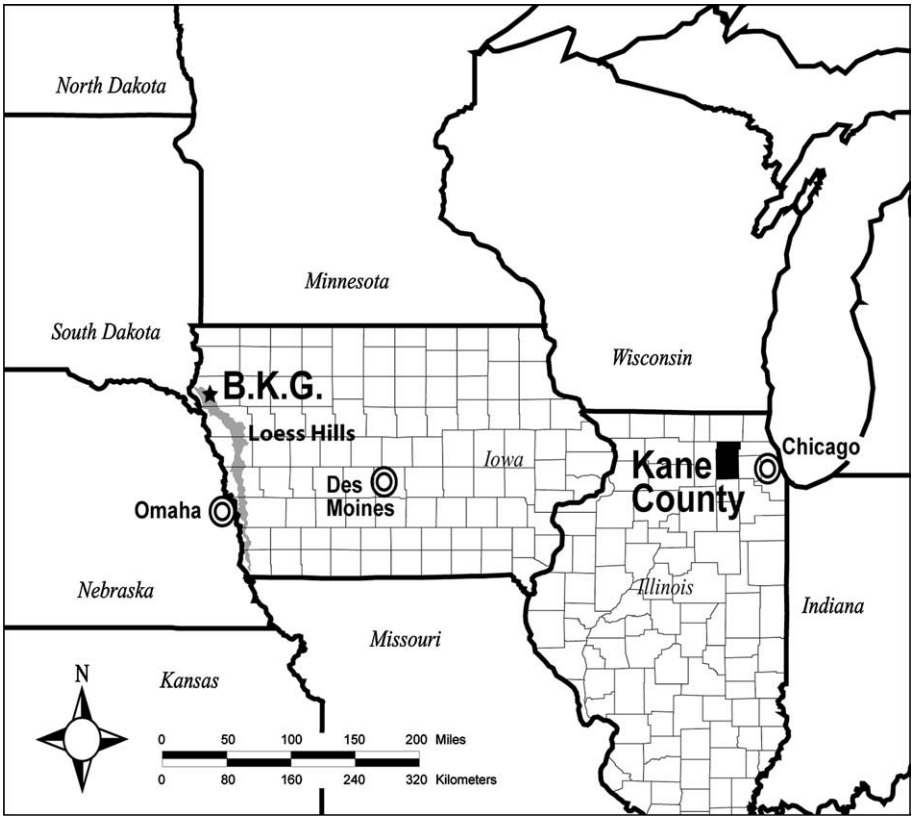

Fig. 1 – Locations of Broken Kettle Grasslands Preserve in the Loess Hills, Iowa, and Kane County, Illinois.