

## **SPATIAL PATTERNS AND THE CHANGES IN UNDERLYING HETEROGENEITY OF REMNANT PRAIRIES IN SOUTHERN WISCONSIN**

CARRIE E. READ, Department of Landscape Architecture, University of Wisconsin-Madison, Madison, WI 53706, USA

\*JOHN A. HARRINGTON, Department of Landscape Architecture, University of Wisconsin-Madison, Madison, WI 53706, USA

*Abstract:* This study documents changes in the spatial patterns of prairie remnants from 1937 - 2005 within the Military Ridge Prairie Heritage Area (MRPHA), a 50,000 acre agricultural landscape in south-central Wisconsin. The MRPHA has been identified as one opportunity to protect Midwest prairie remnants and the open landscape structure important to grassland-dependant bird and insect species. To quantify the spatial patterns of remnant prairies within the MRPHA, five regions and five time periods (1937, 1962, 1980, 1995/2000, and 2005) were selected to represent change over time. ArcGIS 9.1 software was used to digitize interpreted prairie from orthophotos. FRAGSTATS software was used to derive landscape metrics of prairie remnants for each region at each time period. These results were compared for each region as well as between regions to determine the temporal changes in spatial patterns. Between 1937 and 2005, all regions experienced habitat loss which ranged from 44.7% to 86.7%. Increases in prairie patch numbers and decreases in average patch size also occurred. All regions experienced decreases in the mean shape, cohesion, and clumpiness indices. Changes in the spatial patterns of prairies have led to changes in their underlying heterogeneity. Data from the regions examined indicate that prairie habitat in the MRPHA is presently occurring more often on steep slopes (>12%) and is more common on soils with moderate to low fertility and less common on soils with high fertility than was historically observed. All aspect classes contained prairie but aspect was not related to changes in prairie over time.