

Public Abstract

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Title:Land Cover Change 1815 to 2007 in the Central Missouri River Hills

The legacy of land use can influence landscape dynamics for centuries, potentially altering subsequent plant species composition, nutrient cycling and hydrology. To understand how previous land use has affected landscape patterns in the now predominantly forested central Missouri River Hills, this study assesses the magnitude of land cover change between four dates: the onset of European American settlement (circa 1815), near the period of maximum agricultural land use (1939), and through recent episodes of farm abandonment and reforestation (1968 and 2007).

The River Hills, characterized by fertile loess soils and located on the western edge of the eastern deciduous forest, have undergone substantial changes over the past two centuries. In the early nineteenth century, 10% was open canopy woodlands and 90% was closed canopy forest. By 1939 forest accounted for just over 37% of land cover, which then rebounded to 61.5% of the total landscape by 2007. Patch metrics indicate that individual forest patches are decreasing in number while increasing in size, as formerly isolated patches coalesce and increase connectivity; the reverse trend has been true of fields. Land that was forested in 1939 tended to persist as forest to 2007, with newly regenerated forest accreting to existing patches mainly on steep slopes. These patterns of land cover change provide context for understanding contemporaneous changes in forest structure and composition, and can be used to guide management of this comparatively large zone of forest habitat in an otherwise predominantly agricultural region.