

# **Landscape dynamics of floral resources: implications for cultural ecosystem service supply in the Southern Appalachians.**

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## **Abstract**

Cultural ecosystem services (non-material benefits to people from nature) contribute substantially to nature-based economies but are seldom quantified biophysically. Cultural ecosystem services often depend strongly on biodiversity yet are largely absent from biodiversity-ecosystem service studies. Incomplete knowledge of links between landscape heterogeneity, biodiversity, and potential ecosystem service supply can lead to unintended shifts in cultural ecosystem services. We modeled the landscape dynamics of wildflower blooms in the Southern Appalachians and asked: (1) What factors influence the distribution of floral resources across the landscape? (2) How do patterns of biodiversity-based cultural ecosystem service supply change within the spring to late-summer seasons? (3) How does accessibility of floral resources shift from early spring through summer? Data were collected at over 60 sites across a rural-to-urban gradient, and potential wildflower viewing opportunity was mapped. Floral resources were strongly affected by topographic and climate gradients, but their relative importance varied with time period (early spring, late spring, and summer). Flower species richness was negatively related to surrounding building density, but flower abundance was unaffected by building density. Hotspots of floral resources often were not spatially concordant and their locations shifted from early spring to late summer, which changed the proportion of floral resource hotspots accessible to the public. Maintaining a mixture of natural, semi-natural, and agricultural cover types may sustain a high diversity of floral resources and provide increased opportunities to view wildflowers.