



Monitoring Land Use, Land Cover, and Landscape Vegetation Patterns

Importance

Monitoring land use, land cover, and vegetation patterns within and near Southern Colorado Plateau Network (SCPN) parks is critical to understanding ecosystem states and dynamics, biodiversity patterns, available habitats, movements of organisms, and rates of flow of energy and materials. Increased development and intensification of land-use practices (e.g., grazing, logging, recreation) on lands bordering parks have several ecological consequences, including sharper contrasts (edge increases) in vegetation structure and function along park boundaries, change in the effective size of natural ecosystems, changes in ecological flows into and out of the park, loss of adjacent habitat, and increased exposure to human activity along park boundaries. Adjacent land use, combined with legacies of livestock grazing and altered fire regimes within SCPN parks, demand monitoring of land use, land cover, and vegetation patterns.

Long-term Monitoring

Land use, land cover, and landscape vegetation patterns will be monitored every five years for nearly all SCPN parks with remote sensing, primarily Landsat satellite data. The Landsat program is a series of satellites that collect digital reflectance data from objects on the ground to produce images of the earth's surface. Landsat data have a moderate spatial resolution (30 x 30 m), are appropriate for monitoring medium-sized and large areas, and contain sufficient spectral richness to detect important trends in vegetation and land cover. Landsat data will be used to analyze the extent and distribution of land use and land cover across entire parks, and to describe landscape structure (the extent, patch size, spatial configuration, and connectivity of vegetation types) and composition (the distribution, richness, and proportion of vegetation types). Pilot studies are underway; monitoring will begin in 2009.

Land cover describes categories of the natural landscape, such as forest, woodland, and grassland.

Land use is the human use of these landscapes, such as residential, agricultural, and developed areas.

Landscape vegetation patterns are mapped in finer detail than land-cover types—for example, coniferous and deciduous forest—providing more information on the dominant plants.

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Resource Manager Brad Shattuck stands outside the boundary of Chaco Culture National Historical Park, where the impact of livestock grazing is evident.

Management Applications

The first phase of monitoring will document current conditions, with subsequent monitoring designed to detect and highlight changes in these patterns. Sample measures include maps and data describing the composition and distribution of numerous land cover, land use, and vegetation types, as well as indices of habitat fragmentation and connectivity. In addition to providing an overall picture of the landscape of each park, data will be used to assess, for example, questions related to loss or changes in vegetation for habitats of interest, or changing patterns of land use or land cover along park boundaries that may affect park resources.

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Changing land use and land cover on lands bordering Aztec Ruins National Monument.



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