



Landscape Dynamics In Cumberland Piedmont Parks

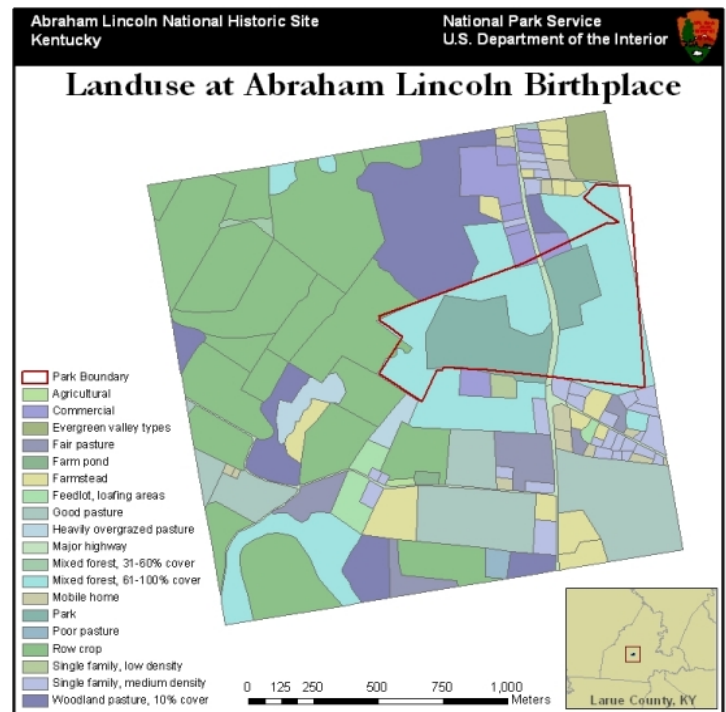
Importance

Landscape dynamics refer to a broad suite of ecological, geomorphological, and anthropogenic processes occurring across broad spatial scales. This Vital Sign ranked in the top ten for all fourteen Cumberland Piedmont Network (CUPN) parks. The need to monitor landscape dynamics is critical to park managers for many reasons, and can be described in four main categories:

- 1) habitat fragmentation: parks may be experiencing a loss in biodiversity due to changes in habitats outside park boundaries from agricultural and sivilcultural practices and road development. Some natural ecosystems in the Southeast already show trends for high losses of habitat, such as long leaf pine forests and wetlands (EPA Briefing on Southeast Ecological Framework 2004);
- 2) increased pollution sources: parks may be experiencing an increase in water-borne contaminants resulting from chemical spills, roadway and railroad run-off, industrial, urban/residential and agricultural waste and run-offs, and air-borne contaminants from agricultural herbicides and pesticides, industrial stack-emissions, and automotive exhaust gases;
- 3) increased avenues for exotic pests: disturbed lands, road development and sivilcultural practices may be causing an increase of invasive plants and/or forest pests;
- 4) audio/visual change: some parks are concerned with impaired viewsheds and increased light and noise pollution.

Preliminary Monitoring Objectives

- Determine areal changes in landuse/cover for parks and surrounding buffer areas.
- Quantify changes in environmental stressors for parks and surrounding buffer areas (point sources) and correlate with results from other vital signs monitoring (air/water).
- Evaluate distribution of selected species/habitats of concern (rare, invasive, and pests) of importance to park managers.
- Document population trends and associated changes (such as new roads/zoning) within park buffer of interest.
- Evaluate landscape patterns, such as potential for parks to function as links in wildlife corridors or as hotspots for biodiversity as compared to surrounding landscape.
- Estimate how changing landuse/cover will affect viewsheds, light and noise levels.
- Determine changes in spatial extent/occurrence of fires within buffer area of importance.



Protocol Development & Status

Building from the efforts of IM Networks and other agencies, the CUPN will develop a protocol in FY2008 using 3-4 test parks. The Network will select 5-10 core themes that pertain to all 14 Network parks, and a few themes will be customized to address individual park needs. NatureServe will assist with the development of landscape integrity tools.

The CUPN does not envision high costs pertaining to data acquisition, rather making use of existing data sources. Two parks have partially completed studies, ABLI and MACA. The ABLI study was conducted through a cooperative agreement with Western Kentucky University during 1999. In 2001, Mammoth Cave National Park funded a land-use analysis associated with aquatic threats for the southern portion of the park's watershed, in cooperation with the USGS. Anderson Level III classification was used. Other agency efforts, such as the National Land Cover Dataset, (currently at Anderson Level II for state of Kentucky) will be reviewed to determine suitability for this project.

Contact

Shepard McAninch at shepard_mcaninch@nps.gov, for CARL, COWP, GUCO, KIMO, NISI parks, or contact Teresa Leibfreid at teresa_leibfreid@nps.gov and/or Lillian Scoggins at lillian_scoggins@nps.gov, for the remaining 9 parks.