



Land Cover Monitoring

Importance

Landscape structure supports the natural diversity of ecosystems and species. The composition, configuration, and connectivity of land-cover types determine habitat availability, energy and material flows, and the movement of organisms on a landscape. Large changes in landscape structure occur in response to natural and human-caused disturbances. Natural disturbances are largely driven by climate; changes in climatic conditions (global warming) may elevate the frequency and severity of disturbances, such as wildfire and insect-disease outbreaks. Human-induced changes on lands adjacent to parks, such as agricultural production and housing development, can impact park ecosystems by influencing energy and material flows across the larger landscape and altering movements of large animals (e.g., bighorn sheep and elk). Given the relatively high perimeter-to-area ratios of Northern Colorado Plateau Network park units, monitoring changes in landscape structure along park boundaries is a high priority for park managers.

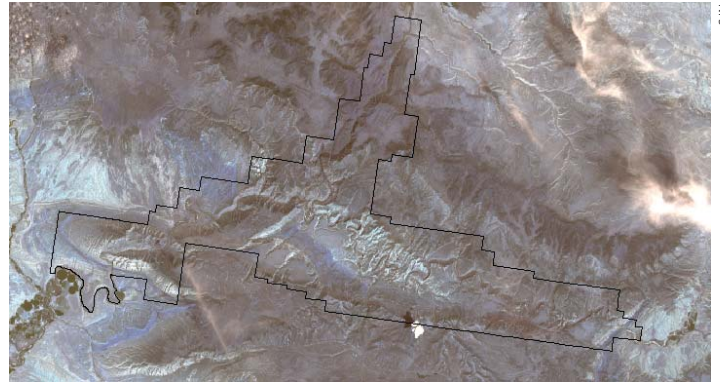
Long-term Monitoring

Land-cover information will be estimated by thematic maps derived from satellite imagery of park units and a surrounding >10-km buffer, on a four-year, rotating basis. Themes are essentially land-cover types, such as grasslands, forests, and developed areas. Changes in underlying vegetative conditions and assessments to evaluate status and trends in landscape composition, configuration, and connectivity will be made by comparing baseline maps to maps from the last monitoring period. At park boundaries, edge-contrast measures will assess the degree of contrast between pairs of land-cover types. Disturbances will be indicated by large-scale changes in land-cover types between years, and ground-truthed to determine the type of disturbance. Over a long timeframe, the frequency and severity of observed disturbances will be used to determine changes in disturbance regimes.

The objectives of land cover monitoring are to determine:

1. Status and trends in the composition and configuration of land-cover types on park and

Land-use types derived from a Landsat image (August 19, 2003) for Arches National Park.



Landsat imagery from Dinosaur National Monument, July 7, 2002, used to make a thematic map.

adjacent lands;

2. Status and trends in the connectivity of land-cover types within parks, and for park and adjacent lands combined;
3. Status and trends in cross-boundary contrasts in land-cover types;
4. Long-term changes in wildfire frequency and extent; and
5. Long-term changes in the frequency and extent of insect and disease outbreaks.

Management Applications

Information from this monitoring effort will provide park managers with a baseline against which to assess future changes in landscape structure and composition; the ability to detect large-scale disturbances in backcountry areas, and information on land-use activities along park boundaries, potential impacts of these activities to park resources, and to aid in formulating mitigation strategies.

Contact

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Network park units where land cover will be monitored

Arches NP	Dinosaur NM
Black Canyon of the Gunnison NP	Fossil Butte NM
Bryce Canyon NP	Golden Spike NHS
Canyonlands NP	Hovenweep NM
Capitol Reef NP	Natural Bridges NM
Cedar Breaks NM	Pipe Spring NM
Colorado NM	Timpanogos Cave NM
Curecanti NRA	Zion NP

NP = National Park; NM = National Monument;
NRA = National Recreation Area; NHS = National Historic Site