

Landscape Dynamics and Human Demographics Monitoring in the Southern Plains Network

PROJECT SUMMARY



Introduction and Background

Landscape dynamics within and around these parks is particularly important due to the small size of SOPN park units. The ecological communities within these parks are as influenced by the ecological processes and land use activities occurring outside of park boundaries as they are by management decisions within the parks. Over the past 150 years, the ecological processes of the SOPN units have been disrupted by increased anthropogenic activity, including replacing the migratory bison with non-migratory cattle, conversion of grasslands and other habitats to agriculture or rural development, and large-scale fire suppression. Human activities within and around SOPN parks has fragmented the landscape, decreased the size of the functional ecosystem, reduced connectivity among native habitat patches, isolated species in small patches, and altered the landscape in a multitude of other ways. Such changes have major implications for fire frequency, native and exotic species distributions, water quality, air quality, habitat fragmentation, soil erosion, and general ecosystem functions. By understanding the landscape dynamics within and around SOPN parks, and the human demographic and socioeconomic factors that drive these dynamics, we hope to be better able to predict disruptive or detrimental changes within our parks and are hopefully better able to plan and implement management to protect our resources.

Monitoring Objectives

Objective 1. Major land use changes

To determine the status and trends of major land use changes that can be detected using inexpensive and readily available remotely sensed data. This objective would not target subtle changes in vegetation cover or succession; rather it would focus on major abrupt changes such as urban encroachment, housing or other developments, new roads, or major shifts of habitat types.

Objective 2. Human demographics and socioeconomic factors

To detect trends in human demographic data and a select set of socioeconomic factors in the vicinity of SOPN parks. These will include, but not be limited to, human population change, housing density, road density, and types and patterns agricultural use. A small set of additional socioeconomic indicators are being evaluated for their value in predicting changes and may be included at a later date.

General Approach

Landscape dynamics and human demographics are two vital signs that SOPN will address within a single protocol. Our basic approach has two components. The first is the use of socioeconomic indicators that are readily available from a variety of sources including the U.S. Census Bureau, U.S. Departments of Agriculture and Commerce, and a host of private marketing firms. Jean McKendry et al. have prepared a suite of socioeconomic atlases using such sources. An alternative to SOPN independently compiling data from such sources is that ESRI, as part of its geographic information system products, has produced a business analyst package containing much of the same information that has already been compiled and incorporated into spatial formats ready to use in ArcGIS, the software already being used by most NPS networks. This package has over 1,100 potential indicators and SOPN is working with the Sonoran Institute to evaluate and select a small subset of these indicators that would provide the most value for the least cost for meeting the SOPN objectives.



Landscape Dynamics and Human Demographics

The second primary component of the SOPN approach is to use inexpensive and readily available remote sensing data to detect major changes in land use in and around SOPN parks. It is unrealistic for SOPN to consider investing in the acquisition of expensive satellite imagery or in vast amounts of time devoted to image processing. SOPN does not have the funds to support such an effort, nor does the risk to SOPN parks warrant such an effort, given that most of our parks are small and within an already fragmented landscape. As such, our approach is intended to compliment the socioeconomic indicators and to provide an evaluation of major landscape changes that have occurred, and were hopefully predicted by the socioeconomic indicators. As part of a cooperative agreement with Texas A & M University, we are currently exploring data sources, with an emphasis on regional or national programs, such as the National Land Cover Dataset (NLCD), that may provide products that have already been sufficiently possessed to meet SOPN needs.



Photo Credit: Jason Lott

Development Schedule

We anticipate a draft of the landscape dynamics (based on remote sensing) portion of the protocol, along with the background chapters from Texas A & M by February 2008. We are planning on an additional cooperative agreement with Sonoran Institute in FY 2008 to develop and refine the socioeconomic portion of the protocol. We anticipate this work being integrated to the work from Texas A & M in late FY 2008 or early 2009, and a completed protocol sometime in FY 2009.

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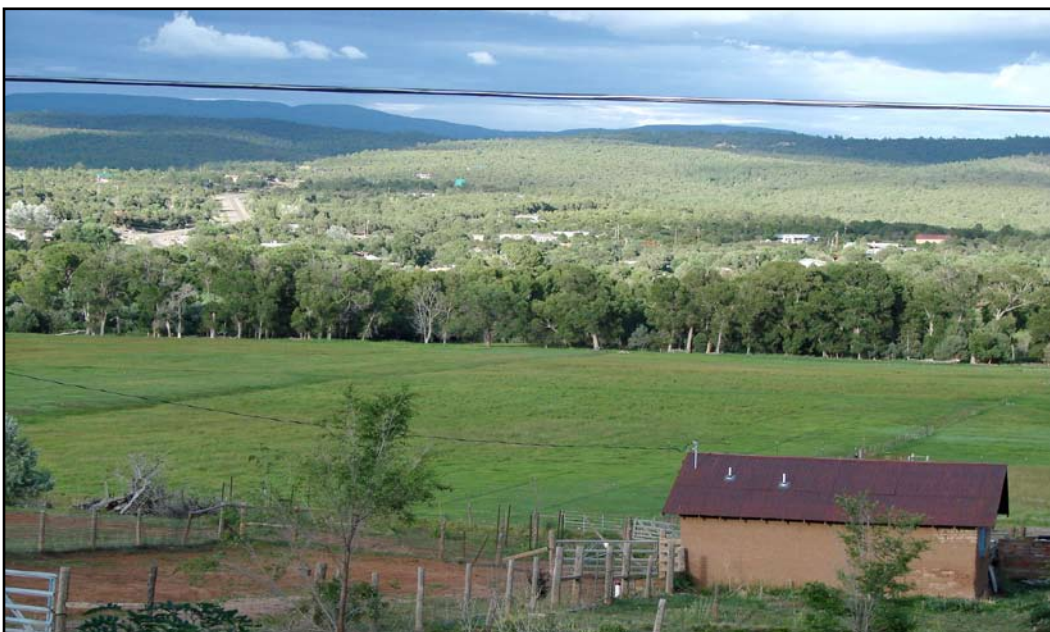


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