Northern Colorado Plateau Network
Park Monitoring Brief

National Park Service
U.S. Department of the Interior

Intermountain Region
Inventory & Monitoring Program

2007

Natural Resource Monitoring at Fossil Butte National Monument

Fossil Butte National Monument/NPS

The Northern Colorado Plateau Network

The Northern Colorado Plateau Network (NCPN) covers a geologically and biologically diverse region comprising 16 national parks in four western states. These parks contain desert grasslands, shrublands, forests, caves, large rivers, perennial streams, seeps, springs, and striking geology. Invasive plants, trampling and grazing by livestock, and adjacent land-use activities are some of the most significant threats to NCPN parks. The NCPN is designing and implementing a long-term monitoring program to measure key indicators of ecological integrity, or "vital signs." Multiple monitoring efforts will help inform managers of the health of park resources and provide early detection of potential problems. This brief describes recent NCPN activities at Fossil Butte National Monument.

Landbirds

Northern harrier/©R. Bennetts

Birds play an important role in the flow of energy through ecosystems because they occupy various levels in the food web. Birds are also sensitive to habitat changes, which make them good indicators of habitat quality. The NCPN is partnering with the Rocky Mountain Bird Observatory (RMBO) to assess breeding bird species trends in three habitats: riparian, pinyon-juniper, and sagebrush-shrubland. NCPN data will contribute to the RMBO's broader, landscape-scale, breeding-bird monitoring program. The NCPN has monitored two plots in sage shrubland at Fossil Butte NM since 2005. The NCPN and RMBO will begin to look at trend data in 2009, after five years of data collection.

Exotic Invasive Plants

Musk thistle/NPS

Exotic invasive plants represent one of the most significant threats to natural resources in national parks. Exotic plants are a concern because they are able to reproduce prolifically, rapidly colonize new areas, displace native species, and alter ecosystem processes across multiple scales. To minimize costs and maximize the potential for eradication, it is critical to detect new populations of invasive species early. At Fossil Butte NM, surveys will cover the places where exotic invasives are most likely to occur: roads, trails, and riparian corridors. Pilot field work for invasive plants at Fossil Butte NM is scheduled to start in summer 2008.

Vegetation Mapping

Vegetation-mapping plot/NPS

The NCPN is nearing completion of a multi-year, multi-partner effort to map the vegetation at Fossil Butte NM. This project has included gathering aerial photography, collecting initial vegetation-plot data, using the vegetation data to classify vegetation types and write vegetation descriptions, writing a dichotomous vegetation-type key, performing photo interpretation, collecting accuracy- assessment data, creating a geodatabase, and writing the final report. These maps will be a valuable resource for use in park management, natural resource monitoring, interpretive programs, park planning, prescribed fire, and as a baseline for designing ecological studies. It is anticipated that the Fossil Butte NM vegetation map will be completed in early summer 2008.

Species Lists

Northern leopard frog/NPS

The NCPN has completed NPSpecies certification at Fossil Butte NM for six taxonomic categories—birds, mammals, fish, reptiles, amphibians, and vascular plants—and has posted the results on its website. An interactive application allows users to select a desired taxonomic category and an alphabetic sort function (i.e., by common name, scientific name, or family–scientific name). Additionally, users can search by park, by status of the species in the park (e.g., present, historic, unconfirmed), and by individual species—allowing users to query, for example, does Fossil Butte NM have a verified report of a northern leopard frog? The resulting species list can be downloaded into an Excel spreadsheet for use by the public, park staff, or park cooperators.

Climate

Early snowstorm/NPS

Climate plays a crucial role in regulating biological and physical processes; rainfall and temperature are the primary factors that limit an ecosystem's structure and function. The NCPN compiles and analyzes climate data from existing weather stations in and around Fossil Butte NM. Over the past 16 years, Fossil Butte NM has shown an increase in average annual minimum and maximum temperatures. This included record highs for January and February 2005. Precipitation was above average in 2005, but close to average in 2006. Climate data for Fossil Butte NM are available in an interactive, graphical format on the NCPN webpage.

Land Condition

Fossil Butte NM/NPS

Information on landscape-scale plant vigor and productivity (land condition) is key to understanding natural and human-caused ecosystem changes. Land-condition monitoring involves the use of the MODIS (MODerate Resolution Imaging Spectoradiometer) satellite imagery. A measure of vegetation productivity, Normalized Difference Vegetation Index (NDVI), is calculated over time to estimate the start and end of the growing season, the time of peak production, and seasonal productivity. This coarse-scale assessment of land condition can reveal important trends in the overall health of a park and surrounding ecosystem. A draft protocol for land-condition monitoring is scheduled to be complete in spring 2008, with monitoring to follow.

Future Projects

The NCPN is continuing to expand ecological monitoring at Fossil Butte NM. Protocols for monitoring land cover and land use, as well as human demographics and development, are underway and planned for future implementation.

For more information

Northern Colorado Plateau Inventory & Monitoring Program
National Park Service
P.O. Box 848
Moab, UT 84532
435-719-2346
http://www1.nature.nps.gov/im/units/ncpn/index.cfm