



Natural Resource Monitoring at Capitol Reef National Park



Jailhouse Rock, Capitol Reef National Park/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 Capitol Reef National Park.

Landbirds



Gray vireo/NPS

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 each in low-elevation riparian areas and pinyon-juniper woodland at Capitol Reef NP since 2006. The NCPN and RMBO will begin to look at trend data in 2010, after five years of data collection.

Uplands



Grassland/NPS

Uplands represent the vast majority of land area at Capitol Reef NP, where grasslands have been selected as the ecosystem targeted for integrated upland monitoring. Integrated upland monitoring includes measuring soil and site stability, hydrologic function, biotic integrity, vegetation composition and structure, and biological soil crusts. In 2007, plots

will be established to begin a three-year pilot study to obtain an estimate of the variance in these parameters. This information will then be used to determine the number of plots necessary for long-term monitoring. The pilot sites are selected in a manner that ensures they will be incorporated into data analysis in the future, full-scale monitoring program.

Vegetation Mapping



Box elder/NPS

The NCPN is nearing completion of a multi-year, multi-partner effort to map the vegetation at Capitol Reef NP. 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 Capitol Reef NP vegetation map will be completed in winter 2007–2008.

Water Quality



Fremont River/NPS

Water is a major factor in determining the distribution of flora and fauna at Capitol Reef NP. The NCPN is currently monitoring water-quality parameters at Halls Creek 12 times per year. In addition, the NCPN collects and analyzes data collected at Capitol Reef NP by the State of Utah. In 2006, NCPN efforts documented the effects of a July flood in the

Halls Creek watershed that significantly altered channel morphology and washed organic matter into the channel, which may have caused a temporary depletion of dissolved oxygen. In general, core parameter values varied within normal ranges for most streams and rarely exceeded water-quality criteria.

Species Lists



Bighorn/NPS

The NCPN has completed NPSpecies certification at Capitol Reef NP 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 Capitol Reef NP have a verified report of a pronghorn? The resulting species list can be downloaded into an Excel spreadsheet for use by the public, park staff, or park cooperators.

Climate



Badlands/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 Capitol Reef

NP. Over the past 15–20 years, Capitol Reef NP has shown an increase in average annual minimum temperatures and a corresponding decrease in snowfall. However, annual precipitation has been too variable to detect any obvious, long-term trend.

Future Projects

The NCPN is continuing to expand ecological monitoring at Capitol Reef NP. Pilot monitoring for protocol development has begun on aquatic macroinvertebrates at Halls Creek. Protocols for monitoring land condition; land cover and land use; air quality; integrated ri-

parian communities; springs, seeps, and hanging gardens; invasive exotic plants; and human demographics and development are underway and planned for future implementation.

For more information

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