



Natural Resource Monitoring at Capitol Reef National Park



Capitol Reef National Park (NPS/D. Thoma)

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.

Flora Checklist



Sego lily.

Sheri Hagwood@USDA-NRCS PLANTS Database

In 2008, a revised checklist of the vascular flora of Capitol Reef NP was completed. This entailed a thorough review of existing literature, re-examination of specimens from the Capitol Reef NP herbarium and other state and national museum collections, and additional field work to corroborate unverified species reports and locate new species. Based on this study, 887 vascular plant taxa have been confirmed or reliably reported as occurring in the

park. Another 117 species formerly considered part of the park flora have now been shown to be falsely reported. At least 7 species are federally listed as threatened or endangered, and 54 more are considered species of concern by the state’s natural heritage program. Introduced plants make up 14% of the park flora (45 species), of which only 3 species are considered noxious weeds by the State of Utah.

Water Quality



Monitoring at Halls Creek/NPS

At Capitol Reef NP, the NCPN is cooperating with the State of Utah to collect water quality data used to assess condition and trends relative to the Clean Water Act, human health, and ecological function. In two years of sampling at Halls Creek, no persistent criteria violations were observed, indicating that water quality in Halls Creek is generally good. Although no

recent exceedances of criteria have been observed on the Fremont River, it is still listed as impaired; ongoing efforts in the watershed upstream from the park continue to mitigate non-point pollution sources. New monitoring sites added at Pleasant Creek and Upper and Lower Sulphur Creek will be monitored in 2009 and 2010.

Landbirds



Juniper titmouse.
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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. The NCPN has monitored two plots each in low-elevation riparian areas and pinyon-juniper

woodland at Capitol Reef NP since 2005. The NCPN and RMBO will produce the first trend estimates for individual bird species after the 2009 field season, the fifth year of NCPN landbird monitoring. The goal is to be able to detect a population change of at least 3% within 30 years. We currently estimate that we will be able to do this for 52 species, representing more than 90% of all individual birds observed during 2005–2007.

Uplands



Uplands plot/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. This protocol measures soil and site stability, hydrologic function, biotic integrity, vegetation composition and structure, and biological soil crusts. In 2008, 21 plots were re-visited and 39 were established as part of a three-year pilot study

to obtain an estimate of the variance in key parameters. All 60 plots will be re-visited in 2009. The information gathered will be used to determine the number of plots necessary for long-term monitoring. Pilot sites were selected in a manner that ensures they will be incorporated into data analysis in the future, full-scale monitoring program.

Vegetation Mapping



Vegetation-mapping plot/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 interpre-

tation, 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. The map is currently planned for completion in 2009.

Riparian Systems



Oxbow/NPS

Riparian ecosystems are potentially sensitive indicators of landscape level change because they are linked to both aquatic and upland systems, perform important ecological functions, and support high levels of biological diversity. Integrated riparian monitoring involves the collection of biological and physical measures, such as riparian vegetation, non-native species invasions, streamflow, alluvial groundwater dynamics, and changes in channel form.

Developing credible, efficient monitoring approaches will help the NCPN to assess riparian-system health and provide early warning of system degradation. Through conversations with park staff, the Fremont River was selected for riparian monitoring in Capitol Reef NP. Testing of riparian methods occurred at Zion NP in the fall of 2008; implementation will begin at Capitol Reef NP in 2009.

Additional Efforts

A climate report, produced by the NCPN in 2008, is available on the network's web page. The NCPN is continuing to expand ecological monitoring at Capitol Reef NP. Invasive plant

monitoring is scheduled to begin in 2009. Protocols for monitoring air quality, land condition, and land cover/land use are underway and planned for future implementation.

For more information

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