



Natural Resource Monitoring at Canyonlands National Park



National Park Service

Green River, Canyonlands National Park.

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 species, 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 Canyonlands National Park.

Big Rivers



NPS

Green River.

Big rivers and their associated riparian zones provide habitat for terrestrial and aquatic species, are intimately associated with unique geologic features, and are major recreation destinations. As demands for Colorado River water increase, streamflow in virtually all rivers within its drainage has been altered by water development projects. In most cases, peak flows have been reduced, resulting in channel narrowing,

geomorphic simplification, and loss of riparian structure and related biological diversity. In response to these concerns, the NCPN is implementing a big rivers monitoring program at four network parks. In 2012, network staff held two stakeholder meetings to discuss plans for monitoring at Canyonlands NP, and completed a reconnaissance trip to evaluate potential monitoring sites. Monitoring will begin in 2013.

Flora Update



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Reddish monkeyflower.

In 2008–2009, the NCPN published an annotated checklist of vascular plant species for each network park. Since that time, nearly 700 changes have been necessary to keep up with new research, due to the discovery of new species and changes to park status and existing nomenclature. For instance, 432 new vascular plant species have been added to the park floras and the status of another 102 species has been

changed. An [addendum to the original checklists](#), compiled by contractor Walt Fertig and published in 2012, details these changes. Canyonlands NP has seen an increase of 33 new plant taxa since 2007, an increase of 5.6% that brings the known and reported park flora to 627 taxa. One of the new species records, pepperwort, (*Marsilea vestita*) represents a new family (Marsileaceae) for the park.

Uplands

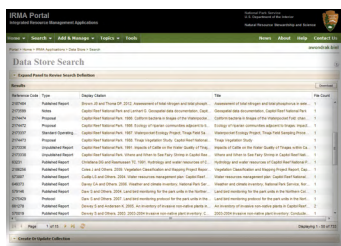


Uplands monitoring plot.

This protocol measures soil stability, hydrologic function, biological soil crusts, and plant community characteristics. Through discussions with park staff, grassland and blackbrush shrublands were selected for integrated upland monitoring in Canyonlands NP. Monitoring began in 2006, the first of a three-year pilot study (2006–2008) to obtain an estimate of

the variance in key parameters. The results of a power analysis performed on the three years of pilot data were used to create a full operational sampling design, implemented in 2009. In 2012, network staff completed the seventh year of monitoring at the park. [Annual reports](#) of upland monitoring are available at the network's web site.

IRMA Data Store



Looking for something? The Integrated Resource Management Applications (IRMA) portal is your web-based “one-stop shop” for documents, data sets, and other types of NPS natural and cultural resource information. In 2011, the NCPN received funding from the national I&M Program to upload digital files to the [IRMA Data Store](#). Overall, a total of 370

digital files were uploaded. About half of those documents were already in digital form; the other half had to be scanned from hard-copy documents. Of the 370 documents uploaded, [84 were linked to Canyonlands NP](#). These documents covered topics including hanging garden communities, water quality, and bats.

Aquatic Contaminants



Stillwater Canyon, Green River.

In 2010, as part of a special project in cooperation with the Environmental Protection Agency (EPA), the NCPN sampled the Colorado and Green rivers at Canyonlands NP for contaminants of emerging concern (those that have not traditionally been tested for during water quality sampling and may not be adequately cleansed by current wastewater treatment methods). Samples were analyzed at an EPA lab for evidence of pesticides and wastewater indicators, including manufacturing byproducts and agricultural and human waste contaminants. Several analytes were detected at low levels at both

sites. Triethylcitrate (multiple sources) and the herbicide 2, 4-D were detected at low levels in the Colorado River, and acetophenone (multiple sources) and tri(dichloroisopropyl) phosphate (TDCP flame retardant) were detected at low levels in the Green River. Follow-up samples will determine if these analytes are persistent. The Colorado River will be re-sampled in 2012, and additionally tested for the presence of pharmaceuticals and personal care products. The network will publish final results from this work at a later date.

Vegetation Mapping



Mapmaking field work.

The NCPN has completed a multi-year, multi-partner effort to map vegetation at Canyonlands NP. This project included gathering aerial photography, collecting initial vegetation-plot data, using the vegetation data to classify vegetation types and write descriptions, writing a vegetation-type key, performing photo interpretation, conducting an accuracy assessment, creating a geodatabase, and writing the final report. The team collected vegetation and environmental data from 914 vegetation classification plots and 373 observation points. A total

of 31,497 map polygons representing 54 natural and semi-natural vegetation map classes were developed for the project, which achieved an overall mapping accuracy of 86.3%. These maps will be a valuable resource for use in park management, resource monitoring, interpretive programs, planning, prescribed fire, and as a baseline for designing ecological studies. All 16 NCPN vegetation mapping projects are now complete. [Summary briefs](#) and data posters for all projects are available at the network website.

Additional Efforts

In addition to the projects described in this brief, the NCPN also monitors climate; landscape dynamics; landbirds; water quality;

springs, seeps, and hanging gardens; land surface phenology; and air quality at Canyonlands National Park.

For more information

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